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Adaptation Fund Board
Project and Programme Review Committee
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LOCALLY-LED ADAPTATION SINGLE COUNTRY PROPOSAL FOR BHUTAN

ADAPTATION FUND

ADAPTATION FUND BOARD SECRETARIAT
TECHNICAL REVIEW OF PROJECT PROPOSAL FOR
"SECURING WATER & ENHANCING CLIMATE RESILIENCE IN THIMPHU (RURAL) DISTRICT, BHUTAN."

Project Title	Securing Water & Enhancing Climate Resilience in Thimphu (Rural) District, Bhutan.
Project ID	AF00000584
Category	LLA
Type	Single country project
Stage	Fully-developed project
Country	Bhutan
Implementing Entity	BTFEC
Financing Requested	USD 5,000,000.00
Reviewer	Linda Ogallo

Co-reviewer(s)

IE Contact Person **Karma Tshering,Singye Dorji,Sonam Lhamo**

Secretariat's Overall Comment

The project Securing Water & Enhancing Climate Resilience in Thimphu (Rural) District, Bhutan aims to enhance the adaptive capacities of communities to impacts of climate change by building resilience and implementation of ecosystem-based adaptation measures in Thimphu district. The first technical review raised several issues such as limited clarity in providing economic, social and environmental benefits, particularly to vulnerable communities, the alignment with locally led adaptation principles , cost-effectiveness and sustainability, full cost of adaptation reasoning, compliance with AF's Results Framework, as is discussed in the number of Clarification Requests (CRs) and Corrective Action Requests (CARs) raised in the review.

Country Eligibility

Is the country party to the Kyoto Protocol?

Response: Yes

Secretariat: Bhutan is party to the Kyoto Protocol (ratified in August 2002) and the Paris Agreement (ratified in September 2017).

Is the country a developing country particularly vulnerable to the adverse effects of climate change?

Response: No

Secretariat: Yes but some clarification is required. Bhutan is a developing country Party to the Paris Agreement. The proposal establishes particular vulnerability credibly: a landlocked, mountainous economy dependent on subsistence agriculture and hydropower, exposed to GLOFs (21 recorded events; 25 of 2,674 mapped glacial lakes assessed as at risk), flash floods, landslides, forest fires and drying water sources. Projections drawn from the World Bank/ADB Climate Risk Country Profile and NCHM show warming of 0.8–1.6 °C by the 2030s and above-global-average warming by the 2090s, with intensifying extreme rainfall. Thimphu District is identified as a hotspot for water-related hazards and as drought-prone, with heatwave probability rising from 2% to around 20–36% by the 2090s. Sectoral impacts on water, agriculture, poverty and gender are described with reference to national sources. CR1: The country context repeatedly characterizes Bhutan as a least developed country (LDC). Bhutan graduated from the LDC category on 13 December 2023 and is now a landlocked developing country. 1. The proposal may wish to update these characterizations and, where relevant. 2. Relatedly, several elements of the evidence base are dated (INFORM 2019 Risk Index, 2017 Poverty Analysis, CMIP5/RCP-based projections from the 2021 country profile) and the proposal may wish to consider whether more recent national data and

CMIP6/SSP-based projections. 3. Finally, the reliance on the INFORM 2019 finding that drought and cyclone risk score zero sits uneasily with the later characterization of Thimphu as drought-prone; the proposal may wish to reconcile these.

Project Eligibility

Has the designated government authority for the Adaptation Fund endorsed the project/programme?

Response: Yes

Secretariat: Yes, as per the letter dated July 24, 2026.

Does the length of the proposal amount to no more than one hundred(100) pages for the fully-developed project document, and one hundred(100) pages for its annexes?

Response: Not Cleared

Secretariat: The proposal is 100 pages but its annexes exceed 100 pages. CAR1: Kindly ensure that all the annexes are not more than 100 pages in total.

Does the project / programme support concrete adaptation actions to assist the country and/or the local actors in addressing adaptive capacity to the adverse effects of climate change and build in climate resilience?

Response: Not Cleared

Secretariat: The project supports concrete adaptation actions: five drinking water supply schemes and four irrigation schemes with identified sites, beneficiary counts and engineering designs prepared by District Engineers; watershed and spring-shed restoration, contour trenching, check dams and riparian rehabilitation; Gewog forest fire coordinating groups; and WUA formalization with registration at the Department of Water. The climate rationale is traceable from the hazard analysis to the interventions. CAR2: The proposal contains internal inconsistencies that affect the assessment of scale, coverage and cost. The stated coverage of 666 households across five gewogs does not reconcile with the household figures given for individual schemes (approximately 1,203 households for drinking water and 224 for irrigation). Component 2 refers to four gewogs while the project targets five. Activity 2.2.1 is used twice and the sequence skips to 2.2.4. The Khasakha scheme reports 206 acres of agricultural land alongside a dryland/wetland breakdown totalling 454 acres. The Khasadrapchu scheme reports 3,000 female and 1,000 male beneficiaries, which sits well outside the national and project-wide sex ratio cited elsewhere. Gewog and locality names alternate between spellings (Mewang/Maedwang; Woluna/Waluna). CAR 3: Several passages retain concept-stage framing and defer work that is expected to be complete at the fully-developed proposal stage. Output 1.2 (page 25) states that detailed community consultations will be held during the full proposal development stage and that priority adaptation actions, including newly identified ones, will be incorporated into the EbA strategy in the full proposal; Activity 1.1.4 similarly places the identification of critical recharge zones and the design of EbA measures after assessments still to be undertaken; and Section K refers to the revised concept note for the environmental and social risk categorisation. As a result, the specific EbA and SLM interventions under Component 1 (their locations, extent,

techniques and expected outputs) are not defined, and the corresponding budget of US$838,900 cannot be appraised for feasibility, unlike the schemes under Component 2. The proposal is requested to confirm what has already been consulted, assessed and decided for Component 1, to present the resulting interventions at the same level of specificity as Component 2, and to remove the residual references to a subsequent proposal development stage throughout the document.

Does the project/programme enable devolving decision making to the lowest appropriate level? Does it give local institutions and communities more direct access to finance and decision-making power over how adaptation actions are defined, prioritized, designed, implemented; how progress is monitored and how success is evaluated.

Response: Not Cleared

Secretariat: The proposal's strongest ground is Principle 4. WUAs already exist in each target community with elected committees and Gewog-approved bylaws, and the project takes them further, formal registration with the Department of Water as recognised legal entities under the Water Act, with training in project management, financial management, M&E and O&M, alongside capacity building for Gewog engineers and technicians. Principle 5 is also reasonably served. Siting the PMU in Thimphu Dzongkhag is a deliberate and demonstrates devolution. On Principle 2, the gender analysis is substantive. It is methodologically transparent, and it generates its own sex-disaggregated evidence on land ownership, income control, natural resource decision-making, time use, group membership and prior training exposure. The GAP matrix screens each activity, assigns a responsible agency and timeline, and the analysis correctly identifies the risk of token representation. The difficulty is that these strengths are not connected to authority or money. Finance is not devolved to the lowest level; nothing in the mechanism reaches a Gewog or a WUA. Section C, which asks specifically for the mechanism providing more direct access to finance, answers with a unit-cost comparison of HDPE piping against concrete channels. The local adaptation committees appear in a single sentence without mandate, composition, resourcing or relationship to the WUAs. Taken together with the fund flow mechanism and the composition of the PSC and TAC, the proposal does not yet demonstrate how decision-making is devolved to the lowest appropriate level or how local institutions gain authority over how adaptation actions are prioritised, designed, budgeted and evaluated. The ESMP places a series of standing responsibilities on WUAs at no cost: annual post-commissioning water-quality testing across all five drinking-water schemes, described as supported by the community; monitoring of rotational allocation compliance under the by-laws; verification that the pipe protection structures at the Wangchhu crossing and the road-crossing enclosures remain intact; monitoring of the Chizhi tail-end outlet; and participatory ESMP monitoring; while USD 48,000 of the USD 86,950 ESMP budget is allocated to a part-time external ESS Expert and no provision is made for the institutions carrying these obligations. Read alongside the arrangement whereby major maintenance depends on local governments including it in annual budgets on request, this raises the question of whether the project creates responsibilities at local level without the corresponding authority or resources. The interdependence problem is visible in three places. First, capability without authority: communities are trained in financial management and M&E but hold no budget and no seat where budgets are approved. Second, an unfunded mandate: WUAs become legal entities carrying O&M responsibility, funded by "minimal fees" and dependent on local governments choosing to include major maintenance in annual budgets on request, against a 2.5-year implementation window. Third, accountability runs upward only, while downward accountability rests on the pre-existing Gewog planning cycle and WhatsApp/WeChat groups. CAR 4: Kindly set out what decision and financial authority Gewog administrations, WUAs and the proposed local adaptation committees will actually hold, how this is reflected in the governance bodies and the fund flow mechanism, and how the recurrent monitoring, testing and maintenance obligations assigned to WUAs in the ESMP will be resourced over the project period and beyond. The grievance redress mechanism is defined in the ESMP but its unclear what recourse is available where a complaint is not resolved at PMU level, given that both tiers sit within the project structure, and how independence is maintained where the

Gewog focal persons receiving complaints are also involved in land-consent, alignment and connection decisions. Adaptive management is referenced at PSC level, with no flexible allocation, contingency or community-triggered adjustment. CR 2: It would be useful to clarify what recourse is available on the grievance redress mechanism, where a complaint is not resolved at PMU level, given that both tiers sit within the project structure, and how independence is maintained where the Gewog focal persons receiving complaints are also involved in land-consent, alignment and connection decisions.

Does the project / programme provide economic, social and environmental benefits, particularly to vulnerable communities, including gender considerations, while avoiding or mitigating negative impacts, in compliance with the Environmental and Social Policy and Gender Policy of the Fund? Does the project/programme address structural inequalities faced by women, youth, children, people with disabilities, people who are displaced, Indigenous Peoples and marginalized ethnic groups?

Response: Not Cleared

Secretariat: Yes but clarification is needed. Economic benefits accrue through rehabilitated and new irrigation serving roughly 429.5 acres and reduced crop loss in a February–June scarcity window confirmed by the household survey; social benefits through drinking water to the target settlements and a reduced collection burden falling mainly on women; environmental benefits through spring-shed and watershed restoration, sustainable land management and forest fire risk reduction across gewogs where a large share of forest cover is fire-sensitive. The ESS/ESMP annex sets out, for each activity, the risk, likelihood and impact, mitigation measure, residual risk, cost, responsible party and a verifiable indicator, supported by a two-tier grievance mechanism, a GBV/SEAH referral pathway with RENEW, NCWC and Gewog Basic Health Units, and a costed total of USD 86,950 against a provisioned ESS and GAP budget line of USD 109,378.49. The gender evidence base is a genuine strength, of which the findings are visibly carried into mitigation measures on WUA composition, training scheduling and outreach. Where the assessment weakens is on the breadth of the structural inequality analysis. It is concentrated almost entirely on gender and on household-level vulnerability categories (elderly, poor, remote, new settler) while youth, children, persons with disabilities, displaced persons and marginalized ethnic groups appear only incidentally or not at all. CAR 5: Twenty-two per cent of survey respondents report existing or anticipated structures on or near their land and ninety-one expect fair compensation, yet no land acquisition, way-leave or compensation framework, entitlement basis or associated budget line is provided; the intended mitigation rests on documented consent alone. Separately, the SEAH and child-labour measures at scheme level (contractor Code of Conduct, worker awareness sessions, confidential reporting channel) are costed at zero across all schemes, against survey findings that only 38% of respondents in Kawang and 47% in Chang feel always safe at water points and that 12% consider children under 18 may be engaged in construction or repair work. Kindly confirm how the SEAH and child-labour measures will be resourced. CR 3: Please clarify how the residual margin between the costed ESMP and the ESS and GAP budget line will be allocated, since Gender Action Plan measures are referenced as drawing on it but are not separately identified or costed, leaving the adequacy of gender resourcing difficult to assess. It would also help to indicate whether persons with disabilities, youth, children, displaced persons and marginalized ethnic groups were considered in the design, and on what basis they were determined not to require specific measures; noting that the survey mentions disability as a barrier to using water infrastructure and one participant with a disability across the consultations. Finally, given a four-year implementation period across five gewogs and nine schemes, please confirm that the eight months of ESS Expert input provided for is sufficient to deliver the monitoring, reporting and updating obligations the ESMP assigns.

Is the project / programme cost effective?

Response: Not Cleared

Secretariat: The proposal argues that EbA and integrated watershed management reduce downstream treatment costs, and that HDPE pipelines outperform concrete lining over the asset life through lower conveyance losses, fewer leakage points, reduced clearing burden on water user groups and lower recurrent maintenance. The reasoning is plausible and context-appropriate. However, the evidence base is narrow; the only quantitative comparison is per-metre conveyance cost, which covers the irrigation channels alone. Component 2 accounts for roughly 72% of activity costs, most of it in the five drinking water schemes, and no cost-effectiveness case is offered for those; for the earthen dams under Output 1.3; or for the US$838,900 in Component 1. Nor is there a clear illustration of an alternatives analysis, the proposal does not set out what other means of achieving the same outcomes were considered. This gap is sharpened by Annex 4, which documents community water tanks, turn-based allocation, rainwater harvesting pits (the most-cited drought coping practice at 40.7%) and collective-labour maintenance through Gyen and zhabto lemi as functioning low-cost systems, and recommends building the schemes on them, evidence the cost-effectiveness section does not use. CAR 6: The detailed cost comparison analysis attributed to the District Engineers is cited as Annex 6 (p. 36), but that annex was not submitted and does not appear in the list of annexes on the final page, which ends at Annex 5. Kindly submit it and reconcile the annex list accordingly. CR 4: Please extend the analysis to the components carrying the majority of spend, and describe the alternative means of achieving the same adaptation outcomes that were considered and the basis on which the selected approach was preferred. Kindly indicate whether the long-run advantage claimed for HDPE has been tested across its stated 10 to 15 year service life rather than at installation cost alone, and how the customary systems recorded in Annex 4 were weighed; in particular whether recurrent maintenance of the new assets has been costed on the assumption that collective-labour mechanisms will carry it.

Is the project / programme consistent with national, sub-national or local sustainable development strategies, national, sub-national or local development plans, poverty reduction strategies, national communications and adaptation programs of action and other relevant instruments?

Response: Not Cleared

Secretariat: Yes, but some clarification is required. Table 5 maps the project against fifteen instruments spanning adaptation planning (NAP 2023, NDC 2021, the Water Sector and Agrifood Sector Roadmaps for NAP implementation), development planning (13th Five Year Plan 2024-2029, the GNH Development Framework and 21st Century Economic Roadmap), sectoral policy and law (Water Policy, Water Act 2011, Water Regulation 2014, National Irrigation Policy, National Forest Policy, FNCRR 2023 as amended 2025) and environmental governance (Climate Change Policy 2020, National Environment Strategy 2020–2030, NEPA 2007). The coverage is comprehensive for a water and ecosystem project and the sectoral fit is clear, particularly the NAP water and agriculture priorities and the 13th FYP Ecological Diversity and Resilience Programme. The weakness is that the alignment is asserted at national level only. No sub-national or local instrument appears in Table 5, no Thimphu Dzongkhag plan, no Gewog development plans, no Local Government Act or its rules. The 12th Five Year Plan for Thimphu District appears once, in a footnote to the context section, and covers 2018–2023, so it is now expired. For a project under the Locally Led Adaptation window, where local planning instruments are the point of entry, this omission is more consequential than it would be otherwise. The alignment statements themselves are also generic: each asserts a contribution without identifying the specific target, indicator or KPI engaged, so consistency cannot be verified against anything measurable. Bhutan's Third National Communication is cited in the context section but not carried into the alignment table. CAR 7: The socio-economic sections present two incompatible sets of poverty figures, both attributed to National Statistics Bureau reports: national poverty of 8.2% with rural at 11.9% and urban at 0.8% in one place, and 12.4% with rural at 17.5% and urban at 4.2% in another; Thimphu Dzongkhag is given as 1.5% in one section and 1.2% in another, alongside a statement that the

rate rose by 0.4% from 1.1% in 2017. Since the poverty case underpins the targeting rationale, kindly reconcile these to a single dated source. Table 5 also cites the Bhutan Water Policy as 2007, while Activity 1.1.1 and the budget notes refer to revision of the Water Policy and Vision 2008; please confirm the correct instrument and date. CR 5: Kindly extend Table 5 to the sub-national and local instruments the project will work through: the current Thimphu Dzongkhag plan, the Gewog development plans for the five target gewogs, and the Local Government Act; and indicate how project activities feed into the local planning cycle. Please also identify the specific targets or indicators engaged within each instrument, rather than the policy area alone, and add the Third National Communication where relevant. Finally, given that the annexes record that gewog and chiwog Water User Associations are largely unregistered under the Water Act 2011 and Water Regulation 2014, particularly in Genye and Dagala, kindly clarify whether formal registration is an intended project output and, if so, where it appears in the results framework.

Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund? Does the project provide support to local actors and build their capacities to comply with the standards?

Response: Not Cleared

Secretariat: On national technical standards the proposal is strong. Table 6 maps each output to the applicable legal and technical instruments and names the institution responsible for compliance. It commits to Initial Environmental Examination where required and to environmental and forestry clearances before construction. Support to local actors is also well developed. The capacity programme targets Gewog administrations, Dzongkhag sector officials, WUAs, forest fire groups, contractors and community monitors, with training modules keyed to the specific standards local actors must apply, delivered through workshops, on-site mentoring, demonstrations and community-based monitoring, and with compliance capacity assessed before and after training. The USP dimension of the proposal falls short. It acknowledges at page 62 that several sub-projects have interventions still to be determined: check dams, spring and source protection, watershed trenching and plantation restoration; to be selected through detailed watershed assessments after approval. This is legitimate, but it is not treated as an unidentified sub-project component in the sense the Fund's USP policy requires, and the elements the policy calls for are largely absent. CAR 8: The proposal does not meet the Fund's requirements for unidentified sub-projects. It does not identify a USP envelope as such, define eligibility or exclusion criteria, or set out the process and decision-making structure through which sub-projects will be selected, approved and disclosed, including how vulnerable groups participate in that decision. It does not contain an explicit commitment by the Implementing Entity to apply the Environmental and Social Policy and Gender Policy to each sub-project once identified, nor a screening procedure to be applied at the point of identification, nor an assessment of executing entity and community capacity to carry out that screening. The grievance mechanism described in the ESMP is not linked to sub-project identification, and the M&E plan contains no provision for capturing learning from sub-project implementation. The timing is also stated inconsistently, with assessments described as taking place in the first year in one sentence and the first six months in the next. Kindly address each of these elements and identify the sub-project envelope explicitly. CAR 9: The safeguards budget does not reconcile across the documents. Table 3 provisions US$65,750 for ESMP and GAP, which the budget notes resolve as US$39,800 for the Gender Action Plan and US$25,950 for the ESMP. The ESMP itself is costed at US$86,950, of which US$61,000 in cross-cutting measures (the grievance mechanism, the GBV/SEAH referral pathway, quarterly monitoring and the ESS Expert) does not appear in the budget at all, and the ESMP validates against a US $109,378.49 safeguards line that matches neither figure. Kindly reconcile the three sets of figures and confirm how the cross-cutting measures will be funded. CAR10: The ESMP also requires correction. Residual risk is recorded as identical to initial risk in six construction rows across Outputs 2.1 and 2.2 (pp. 45, 47, 50, 53, 55 and 56), so no risk reduction is demonstrated, whereas the equivalent rows at pp. 43, 58 and 59 reduce to Low. Sections 2.1, 2.2 and 2.3 contain duplicated and corrupted text, with paragraphs repeated two to three times

and sentences interleaved mid-word (pp. 11–12). The matrices contain blank risk cells (Table 4, pp. 19 and 27; Table 5, pp. 37 and 65), a missing risk significance rating (Table 4, p. 25), and blank cost cells (Table 5, pp. 33, 36, 38, 60 and 62). Likelihood and impact entries are concatenated into single cells in the SEAH rows (pp. 22–25 and 28). Item counts do not reconcile, with 90 of 91 items screened at p. 4 against 48 individually screened activities and sub-activities at p. 29. Two training indicators specify a target of 0% women (p. 39, activities 1.2.3.b and 1.2.3.c), against 30% for the equivalent indicator at p. 38, and the ESS Expert cost appears as "48,00" at p. 69. Kindly make these revisions. CR 6: Please clarify how the sub-project mechanism will be used to give communities and WUAs a decision-making role over the EbA interventions under Activity 1.1.4b, given the scale of the allocation and the LLA framing of the proposal. Kindly also confirm whether the eight months of ESS Expert input provided in the ESMP is sufficient to screen sub-projects, update the ESMP and monitor compliance across four years, five gewogs and nine schemes, and indicate how Annex 4's finding that WUAs are largely unregistered under the Water Act 2011 and Water Regulation 2014 will be addressed, since Table 6 relies on WUA formalisation as the compliance route for Output 3.1.

Is there duplication of project / programme with other funding sources? Does the project enhance collaboration across sectors and enhance efficiencies and good practice?

Response: Not Cleared

Secretariat: Table 7 identifies six relevant initiatives: GCF FP107, the GEF ecological connectivity project, CARE-LG (GCF SAP038), ACREWAS (Adaptation Fund), InAF-Bhutan (AF Innovation) and ECRUL (GEF-LDCF); with start dates, the nature of the synergy and a stated method for preventing duplication in each case. Coordination rests on the Ministry of Finance as Designated Authority and National Designated Authority for both the Adaptation Fund and GCF, so all external financing passes through a single point, which is a genuine structural safeguard against duplication. Cross-sectoral collaboration is a real strength of the design. The project brings water, agriculture, forestry, local governance and disaster management into a single results framework through five executing entities, with health services drawn in through the referral pathway, and it works across national policy, dzongkhag and gewog levels simultaneously. The weakness is that the non-duplication case is asserted rather than demonstrated where it matters most. Two of the six listed projects operate inside Thimphu Dzongkhag. ECRUL undertakes watershed restoration, hydrological monitoring, stormwater management and early warning in Thimphu and Paro, which overlaps directly with Output 1.1's hydrogeological mapping and microclimate and meteorological stations and with Output 1.2's watershed works. The distinction offered is urban against rural, but Chang and Kawang are described elsewhere in the package as peri-urban gewogs on the fringes of Thimphu Thromde, precisely where that line is least reliable. CARE-LG is a national adaptation grant facility funding local climate-resilient infrastructure in vulnerable gewogs, and the stated mitigation is that target gewogs and investments will be mapped during annual planning, which defers the question on duplication. The review is also confined to donor-funded projects; no domestically financed investment is examined, although rural water supply schemes are routinely funded through Dzongkhag and Gewog annual budgets in the same locations. CAR 11: The duplication assessment does not confirm, at gewog and scheme level, that the proposed investments do not overlap with the two initiatives operating in Thimphu Dzongkhag or with the CARE-LG grant facility. Kindly provide the gewog-level footprint of ECRUL, the GEF ecological connectivity project and CARE-LG against the five target gewogs and nine schemes, confirming that no proposed scheme, watershed intervention or hydrological monitoring station duplicates an investment already financed or committed. Please also confirm that ongoing Royal Government of Bhutan investment in rural water supply and irrigation in these gewogs under the 13th Five Year Plan has been checked, since the assessment currently covers externally funded projects only. CR 7: ACREWAS is an Adaptation Fund project undertaking closely comparable watershed, spring restoration and sustainable land management work in other dzongkhags. Kindly indicate what has been drawn from its experience (safeguards instruments, WUA strengthening approaches, springshed protocols or monitoring

systems) so that the synergy described extends beyond geographic separation to demonstrable reuse of good practice. Please also clarify how CARE-LG's grant facility modality was considered, given that it devolves adaptation finance directly to gewog level and may offer a tested channel relevant to this project's own delivery arrangements. Finally, kindly describe the mechanism through which cross-sectoral coordination among the five executing entities will operate in practice, including the composition and mandate of the Technical Advisory Committee referred to in Table 7.

Does the project / programme have a learning and knowledge management component to capture and feedback lessons, in particular managing traditional and/or indigenous knowledge, where relevant? Does it contribute to building and institutionalizing local capacities?

Response: Not Cleared

Secretariat: The indigenous knowledge work is the strongest element. Annex 4 triangulates a literature review, a household survey and the July 2026 consultations, records the living Chusub water-manager role within current WUA office-bearer structures, and documents two customary institutions. It also tests this knowledge, concluding that new WUA by-laws must correct the identified gaps rather than reproduce them. Local capacity building is also substantive. Output 3.2 invests in training Gewog administrations, WUA office bearers and community representatives in adaptation planning, financial management and monitoring and evaluation, which is the kind of investment that leaves an institutional legacy rather than a set of documents. Where the component falls short is in resourcing and in the translation of knowledge into practice. Output 3.3 is on knowledge management, learning and dissemination in its entirety, including activity 3.3.3 on monitoring and evaluation of project results, is budgeted at US$5,000, which is 0.12% of direct costs, and the whole of it falls in Years 3 and 4 with nothing in Years 1 and 2. Against this sits a narrative promising annual learning workshops, three dissemination workshops with field visits, a knowledge-sharing platform, a communication strategy, case studies, technical reports and an ILK documentation system. More importantly, a KM budget that begins in Year 3 cannot inform adaptive management, because it produces lessons only after the decisions they would have changed have been taken. The nine recommendations from Annex 4 are reproduced in Section G in the conditional, without any being traced to a specific activity, a budget line or a results framework indicator, so the ILK findings risk terminating in the annex. The single Output 3.3 indicator, five knowledge products developed and disseminated, counts production rather than access, use or influence. CAR 12: The US$5,000 allocated to Output 3.3, entirely in Years 3 and 4, is not commensurate with the knowledge management, learning, dissemination and monitoring activities described, and provides no capacity for learning to inform implementation during the years when course correction is possible. Kindly revise so that learning activity begins in Year 1, and confirm where the monitoring and evaluation function under activity 3.3.3 is funded, given that it appears both within this output and within the execution and implementing entity fee lines. Please also identify which of the Annex 4 recommendations the project adopts, and how they are reflected in the activities, budget lines and results framework indicator; in particular the community-led ILK documentation and learning system, the formal recognition of Gyen and Dedrik within WUA operations and land-siting procedures, and the recognition of the Chusub role within WUA governance structures. CR 8: Kindly describe how monitoring data will be used to adjust programming during implementation, and whether any mechanism exists to reallocate resources in response to lessons, since the proposal currently describes reporting rather than adaptive management. Please also set out how knowledge will flow downward as well as upward: what information about project performance communities will be able to access, in what language and format, and through what channel, noting that Dzongkha and local-dialect materials and community radio appear only as an ESMP mitigation measure costed at zero. Finally, kindly clarify how local lessons will reach beyond Bhutan, as the current plan reaches national platforms and government portals but no further, and the Gyen and Dedrik findings in particular are of wider interest to locally led adaptation practice.

Has a consultative process taken place, and has it involved and encouraged all key stakeholders, and vulnerable groups, to meaningfully participate in and lead adaptation decisions? Did the consultative process consider and address gender-based, economic and other inequalities in compliance with the Environmental and Social Policy and Gender Policy of the Fund?

Response: Not Cleared

Secretariat: The process is reasonably extensive and ran from May 2025 to July 2026 across national to community levels. The stakeholder list is appropriately wide, and the Technical Working Group's terms of reference formally require members to keep proposal development participatory and gender-responsive. A participatory Gender Assessment across all five gewogs identifies limitations to women. These findings are carried into a costed Gender Action Plan at Annex 2, and a target is set to ensure women inclusion in WUA executive positions and measures targeting the Wangchhu River Basin Committee, Community Engagement Platforms and local government planning processes. Two weaknesses stand out. First, Section H reports no participation data at all, no gewog breakdown for either round. The disaggregated July 2026 figures appear only in Annex 4 and the ESMP, and no figures are given anywhere for the first round of consultations. Annex 4 also records that female participation varied sharply by gewog, and cautions that participation should not be assumed to translate into influence over technical and siting decisions; a finding Section H does not acknowledge. Second, disaggregation beyond sex is effectively absent. The stakeholder list names youth, elderly persons and other vulnerable community members, but the only record of a participant with a disability across the entire process is a single individual noted in one focus group; no participation is evidenced for tenants, landless sharecroppers, new settlers or remote households, which are precisely the groups the survey identifies as excluded from existing water services. CAR 13: Kindly report, for both rounds of consultation, in Section H the number of participants by gewog disaggregated by sex, and indicate the participation of vulnerable groups identified in the project's own evidence base (persons with disabilities, elderly and elderly-only households, youth, tenants and landless sharecroppers, new settlers and remote households). Please also address the uneven female participation recorded in Annex 4, particularly in Genekha, Mewang and Kawang, and describe what measures will be taken to reduce barriers to participation for women and economically disadvantaged households in areas where meaningful participation has been identified as a challenge. CR 9: The section describes communities reviewing water source conditions, confirming feasibility, validating proposed interventions and identifying local contributions. Kindly clarify which elements of the project were determined by communities rather than validated by them, and give an example of a design decision changed as a result of community input, so that the claim of leadership rather than consultation can be assessed. Please also confirm whether a stakeholder engagement plan covers the implementation period, and how the consultation record will be maintained and disclosed, noting that the ESMP's disclosure and consultation plan addresses this in part.

Is the requested financing justified on the basis of full cost of adaptation reasoning?

Response: Not Cleared

Secretariat: Section I does not present full cost of adaptation reasoning. It makes a country-level case for concessional finance and then restates the project's alignment with the Adaptation Fund Results Framework, which is already set out in Part III Section F. Both are relevant, but neither address the question on the full cost of adaptation reasoning. What is missing is the reasoning itself: a description of the development baseline, of what would occur in the absence of Adaptation Fund financing, and of the increment between the two. The section does not identify a business-as-usual scenario for water service provision in the five gewogs, does not distinguish the cost of standard rural water supply and irrigation from the additional cost of making those systems climate-resilient, and does not explain the adaptation increment for any component. This matters most for Component 1

activities that sit close to the development baseline and therefore require the clearest additionality reasoning, and receive none. It also matters for Component 2, where the five drinking water and four irrigation schemes account for US$3,044,504, because rural water supply is an established government function delivered through Dzongkhag and Gewog budgets, so the incremental adaptation rationale needs to be made explicitly rather than assumed. The section is also built on superseded data. It cites GDP of US$2.2 billion, GDP growth of negative 10.08%, a fiscal deficit projected for 2021-22, debt at 138.8% of GDP in 2020-2021, revenue declines projected for 2022-23, and COVID-19 as an ongoing shock, sourced to a World Bank Country Partnership Framework covering FY2021-24 and an IIED paper from 2018. This describes conditions from four to five years earlier, and Bhutan's macroeconomic position has changed materially since. CAR 14: Kindly provide full cost of adaptation reasoning for the requested financing. This should set out the baseline scenario for water service provision and watershed management in the five target gewogs in the absence of Adaptation Fund support, identify what portion of the proposed investment represents standard development expenditure and what portion represents the additional cost of climate resilience, and explain the adaptation increment at component level; with particular attention to the national-level institutional activities under Component 1 and to the drinking water and irrigation schemes under Component 2, given that both fall within existing government mandates. Please also update the macroeconomic and fiscal data underpinning the financing argument to current figures. CR 10: Please indicate whether any Royal Government of Bhutan or other baseline investment in these gewogs is being complemented by the project, and confirm that Adaptation Fund financing is not substituting for planned government expenditure on the same schemes, since no co-financing or baseline contribution is identified anywhere in the budget. Kindly also confirm the correct designation of the ministries referred to in this part of the proposal, which appear variously as the Ministry of Energy, Environment and Natural Resources and the Ministry of Energy and Natural Resources.

Is the project / program aligned with AF's results framework?

Response: Not Cleared

Secretariat: The alignment table in Part III.F does not follow the Results Framework Alignment Table template and does not demonstrate alignment as required. The LLA indicators are absent. The SRF indicator monitoring table is missing entirely. At fully developed proposal stage both tables are required in Part III(E): the project-specific results framework and the SRF indicator monitoring table, the latter setting out for each selected SRF indicator the linked project indicators, disaggregation categories, baselines, targets and responsible party. Only the first is present. On the results framework itself (Part III.E). It carries indicators, means of verification and assumptions, which is good structure. But the objective-level land area target reads "TBC ha" in a fully developed proposal; three of five outcome and objective targets are unquantified. CAR 15: Kindly revise so that: 1. The table is presented in two sections, with project outcomes mapped to a single most relevant Fund Outcome and Fund Outcome Indicator in the upper section and project outputs to a single most relevant Fund Output and Fund Output Indicator in the lower section; 2. Fund Outcomes, Outputs and Indicators are reproduced exactly as worded in the Fund's framework, and drawn consistently from one version of that framework; 3. Grant amounts are entered against each Fund Outcome and each Fund Output, with outcome-level and output-level totals each equalling the total project activity cost; every Fund Outcome appearing in the lower section is also reflected in the upper section; and the applicable core indicators are identified. CAR 16: The SRF indicator monitoring table required in Part III(E) at fully developed proposal stage has not been provided. Kindly include it for each SRF indicator selected in the alignment table, showing the linked project-specific indicators, disaggregation categories, baseline and mid-term and final targets, and the responsible party. CAR 17: The results framework does not yet meet the requirement for measurable targets and gender-responsive indicators. Kindly quantify the objective-level land area target, currently shown as "TBC ha", and the outcome-level targets for beneficiary population and ecosystem-based adaptation interventions; replace the narrative baselines with values, or state

where a value cannot be set that it will be established through the budgeted inception baseline survey; set the baseline for number of beneficiaries at zero and reconcile the 15,000 target with the beneficiary figures raised at CAR 2; apply sex-disaggregated targets, not only sex-disaggregated indicators, across all people-level indicators; incorporate the Gender Action Plan indicators and targets; and reconcile the differing names and outcome statements between Parts III.E and III.F. CR 11: As a project under the locally led adaptation window, the proposal may wish to report against the LLA modality and Indicators please see guidelines below and revise. Please see https://www.adaptation-fund.org/wp-content/uploads/2026/07/AF-Strategic-Results-Framework-Guidance-Document_Final.pdf#page=2.11 Please also see revised guidelines https://www.adaptation-fund.org/wp-content/uploads/2026/04/AF-SRF-Updated-templates_results-framework-table-and-results-framework-alignment-table.pdf Updated Templates - https://www.adaptation-fund.org/document/alignment-with-adaptation-fund-results-framework-template-and-guidance-dec-2025/

Has the sustainability of the project/programme outcomes been taken into account when designing the project? Does the project/programme support long-term development of local governance processes, and improve the capacity of local institutions to ensure that communities can effectively implement adaptation actions over the long term?

Response: Not Cleared

Secretariat: Yes, however clarification is required. Sustainability is anchored in existing government machinery rather than in project structures and gives local government a standing budget line rather than a discretionary one. Executing entities are line ministries with existing mandates for the recurrent costs of irrigation and water supply, and the proposal commits to writing sustainability provisions into the Subsidiary Agreement between the NIE and the Royal Government, which converts an intention into an obligation. The description of how existing WUAs already function is concrete and evidences that the model works in Bhutan. Technical backstopping after project close is named to specific institutions, and there is a defensible division of labour between WUA-managed minor maintenance and local-government-funded major maintenance. The technology choice reasoning on HDPE pipeline against concrete channels, on maintenance cost and 10–15 year service life, is an unusually good piece of sustainability analysis. However the sequencing is a challenge: Output 3.1, the establishment and strengthening of Water User Associations, is budgeted entirely in Year 3, with nothing in Years 1 or 2. The five water supply schemes and four irrigation schemes are built in Years 1 to 3, most of the expenditure falling in Years 1 and 2. The institutions intended to own, operate and maintain these assets are therefore created after most of them are complete, which reverses the sequence the sustainability case depends on and removes the WUAs from the design validation and construction supervision that the stakeholder tables say they will participate in. It also sits awkwardly against the results framework, which lists WUA formation as voluntary and the baseline as non-formal. There is also a costing gap already raised at CAR 4 where the project creates responsibilities at local level without the corresponding authority or resources. Ecosystem sustainability is not addressed. Watershed rehabilitation, springshed protection and sustainable land management are permanent assets requiring ongoing management. Community Forest Groups appear in the stakeholder tables as responsible for protecting restored areas, but no institutional arrangement, bylaw basis, budget or post-project support is described for them, and the Gewog Forest Fire Coordination Groups are volunteer-based with continued participation listed as an assumption and nothing to sustain it. The USD 5,000 allocation to the Wangchhu River Basin Committee in Year 3 is similarly unaccompanied by any commitment to recurrent financing after close. No exit or handover strategy. There is no discrete transition plan setting out when assets transfer, to whom, on what legal basis, and against what readiness criteria. CAR 18: Output 3.1 on the establishment and strengthening of Water User Associations is budgeted entirely in Year 3, while the water supply and irrigation schemes those associations are to operate and maintain are constructed in Years 1 to 3. Kindly revise or justify how the associations are established and functional before or alongside construction of the schemes they will manage, and if revised, reflect the revised phasing in the budget and workplan. CAR 19:

The financial sustainability case rests on WUA member fees for minor maintenance and local government annual budgets for major maintenance, but neither is quantified. Kindly provide an indicative annual operation and maintenance cost estimate for the drinking water and irrigation schemes and for the restored watershed areas; indicate the fee level required and how it was determined; confirm how the exemption for vulnerable and marginalised households will be offset; and provide evidence, drawn from current Gewog and Dzongkhag budget allocations, that the residual maintenance cost can be absorbed through the annual budgeting process rather than being contingent on a successful request. CR 12: Kindly set out a consolidated exit and handover strategy identifying the point at which each asset and function transfers, the receiving institution, the legal basis for transfer, and the readiness criteria to be met before handover, including the arrangements for custody of restored watershed areas and for continuation of the Wangchhu River Basin Committee and the Gewog Forest Fire Coordination Groups after project close.

Does the project / programme provide an overview of environmental and social impacts / risks identified, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?

Response: Not Cleared

Secretariat: The proposal presents the required elements in outline: a completed fifteen-principle checklist (pp. 61–62), a Category B determination, an ESMP at Annex 3, a Gender Assessment at Annex 2, a dedicated Environmental and Social Safeguards and Gender Specialist, and an undertaking that the ESMP will be updated once the EbA interventions are confirmed. Substantive risk descriptions do exist in the proposal; the screening table at page 76 characterizes risks by principle with impact and likelihood scores and is followed by environmental and social risk management measures. The difficulty is that Section K itself, which is the section set out for this purpose, does not carry those findings. For all thirteen triggered principles the checklist records only a uniform "Moderate Risk (Category B)" together with a statement that further assessment is required. It therefore identifies subjects for future assessment rather than impacts and risks that have been identified, and it contains no mitigation measures. Under Section 4 of the ESP Guidance, Section II.K is where the IE documents and summarises the findings of the screening and assessment process, and impact assessment should as a general rule be completed before a fully-developed proposal is submitted. Several principle entries also appear to have been assigned to the wrong principle. The inconsistencies between this checklist, the page 76 table and the ESMP, the "no further assessment" determinations for Indigenous Peoples and Physical and Cultural Heritage, the residual concept-stage sentence, and the basis for the Category B determination. ESMP costing and internal defects are covered by CAR 9, land and SEAH provisions by CAR 5, unidentified sub-project screening by CAR 8, and Gender Action Plan by CR 3. CAR 20: The proposal presents different and mutually inconsistent screenings of the same project. Kindly reconcile: 1. The checklist at page 61 marks Indigenous Peoples and Physical and Cultural Heritage as requiring no further assessment for compliance, while the ESMP records all fifteen principles as triggered, and the cultural heritage determination is contradicted by the project's own evidence, including the Chizhi Gompa clearance requirement and the 20% of survey respondents reporting sacred sites near water infrastructure. A third screening at page 76 applies a numeric 1–5 impact and likelihood scale, whereas the ESMP uses a Low, Medium and High scale. The ESMP's own Indigenous Peoples determination is internally inconsistent, recording the principle as triggered while stating that Bhutan does not recognise legally distinct Indigenous Peoples, and Annex 4 states that the screening outcome is that no community in the project area constitutes a distinct Indigenous People under UNDRIP. 2. For Component 2, where the drinking water and irrigation works, their locations and their beneficiary schemes are already identified, assessment cannot be deferred to implementation; the ESP Guidance expects it to precede submission of a fully-developed proposal. CAR21: Kindly complete the table as follows. 1. In the third column, for each risk categorised as low, medium or high, please provide a brief justification of one to two sentences explaining the risk and its potential impacts, followed by a description of whether further management is required and of the mitigation measures. At the

fully-developed proposal stage a robust plan is required, so the measures entered here should be those set out in the ESMP and should be cross-referenced to it, with the affected group and the responsible party identified. 2. Kindly also revisit the following entries, which do not correspond to the principle under which they are recorded: - Protection of Natural Habitats is answered by reference to invasive alien species and native planting, which falls under Conservation of Biological Diversity, and the table does not state whether critical natural habitat is present in or near the project area or whether the project has potential to affect it, directly, indirectly or cumulatively; - Conservation of Biological Diversity is reduced to environmental flows; - Climate Change is answered by reference to climate-smart design, whereas the principle concerns whether the project would result in any significant or unjustified increase in greenhouse gas emissions or other drivers of climate change, for which a qualitative risk assessment against each driver would be appropriate; - Pollution Prevention and Resource Efficiency is reduced to compliance with the environmental clearance and addresses neither resource and energy efficiency nor the management of construction wastes, spoil, fuel and agrochemicals; and - Public Health is reduced to occupational health and safety, which belongs under Core Labour Rights, whereas the principle concerns effects on the determinants of health of the affected population, for a drinking water and irrigation project, water quality and continuity of supply in particular. (The same misreading of Climate Change and Public Health appears in the page 76 table and should be corrected consistently). CR 13: Please reflect the findings of the completed Gender Assessment in the Section K entry for Gender Equality and Women's Empowerment. The entry states that further assessment is required on women's participation, although Annex 2 has been completed and the page 76 table already identifies specific gender risks, including increased unpaid workload from higher agricultural production and water availability and under-representation of women in WUA leadership.

Resource Availability

Is the requested project / programme funding within the cap of the country?

Response: Cleared

Secretariat: Yes. The request is US$5,000,000.

Is the Implementing Entity Management Fee at or below 8.5% per cent of the total project/programme budget before the fee?

Response: Not Cleared

Secretariat: CAR22: Not Cleared. The Implementing Entity fee of USD 354,230 presented in the components and financing table, detailed budget and disbursement schedule would be below the applicable ceiling of 8.5% of the total project cost before the fee. However, the budget notes instead identify an IE fee of USD 318,000, while the annual IE-fee allocations add to USD 354,229 rather than USD 354,230. Please reconcile the IE-fee amount consistently across all budget tables and provide an itemized breakdown of the services financed through the fee. Please also revise the overall cost structure to follow A+B+C. The USD 39,800 for GAP mitigation and USD 25,950 for ESMP implementation are currently presented as separate additions outside the project components, execution costs and IE fee. These costs should be incorporated under the relevant project components and/or execution costs according to the nature of the activities. In the IE-fee breakdown, please distinguish BTFEC's oversight and quality-assurance functions from project execution. In particular, clarify the allocation of baseline preparation, safeguards and gender support, monitoring missions, inception, learning and dissemination

workshops, evaluations and audits. Costs for delivering project activities or supporting day-to-day implementation should be placed under the relevant project components or execution costs rather than the IE fee. Please also ensure that these costs are not duplicated elsewhere in the PMU, GAP, ESMP or Component 3 budgets.

Are the Project/Programme Execution Costs at or below 9.5 per cent of the total project/programme budget (including the fee)?

Response: Not Cleared

Secretariat: CAR23: Not Cleared. The execution-cost amount of USD 374,200 presented in the components and financing table, detailed budget and disbursement schedule would be within the applicable ceiling of 9.5% of the total project cost A+B. Once the GAP and ESMP costs are incorporated into the project cost or under EE fee, the A+B amount would change. However, the budget notes instead identify execution costs of USD 366,800, while the annual execution-cost allocations add to USD 374,199 rather than USD 374,200. Please reconcile the execution-cost amount across all tables and provide a fully itemized breakdown showing the amount and basis of calculation for each PMU staff position, travel and transportation, office and IT costs, monitoring, reporting, PSC and TAC meetings, stakeholder consultations, safeguards implementation, grievance management and other project-management expenses. Please also clarify the allocation of monitoring missions, safeguards and gender functions, stakeholder and learning workshops, and related travel between execution costs, project components and the IE fee, and confirm that no costs are duplicated.

Eligibility of IE

Is the project/programme submitted through an eligible Implementing Entity that has been accredited by the Board?

Response: Cleared

Secretariat: Accreditation Expiration Date is on February 06, 2029

Implementation Arrangements

Is there adequate arrangement for project / programme management, in compliance with the Gender Policy of the Fund? Do the implementation modalities enable giving local institutions and communities more direct access to finance and decision-making power over how adaptation actions are defined, prioritized, designed and implemented?

Response: Not Cleared

Secretariat: Figure 13 does not represent the arrangements described in the narrative and does not function as an organisation chart. The component boxes are identified by component number only, and three of the six named Executing Entities, do not appear anywhere in the chart, so no Executing Entity can be traced to the

component it executes. No reporting line is drawn from the PMU to BTFEC as NIE, although the reporting schedule requires safeguards, gender and performance reports to be submitted to the NIE, and the chart instead places BTFEC in a single box with the Adaptation Fund. Gewog Administrations, WUAs and Local Adaptation Committees are absent, the only local element being an undefined landscape box. The chart also assigns the PSC a membership of five entities; that is stated nowhere in the text and that excludes three Executing Entities. CAR 24: Kindly revise the chart so that each Executing Entity is shown against the component it executes, oversight, reporting and fund-flow lines are distinguished, and the NIE's supervisory relationship to the PMU is reflected. Please also set out in the narrative the composition, chairing, quorum and meeting frequency of the PSC, as has been done for the TAC, and clarify the oversight arrangement given that the PMU is housed within Thimphu Dzongkhag Administration, which is itself an Executing Entity for Components 2 and 3 and for project coordination, and is therefore among the entities whose reports the PMU consolidates. CR 14: The gender commitments in the implementation arrangements attach to consultations, training, WUAs and Local Adaptation Committees, but not to the project's own governance and management structures. The TAC is composed entirely of technical officials with no requirement for women's representation, the PSC composition is undefined, and the PMU staffing in budget note 27 comprises a Project Manager, two Project Engineers and an M&E Officer, with no safeguards or gender post; the ESS and gender function appears instead under the IE management fee as consultancy support. Kindly clarify how gender-responsiveness will be secured within the PSC, TAC and PMU themselves, including any representation targets for these bodies, and confirm where the safeguards and gender function sits institutionally and how it relates to the PMU's day-to-day supervision of Executing Entities.

Are there measures for financial and project/programme risk management? Do local stakeholders contribute to the design and management of the project risk management?

Response: Not Cleared

Secretariat: Part III.B sets out a credible risk management architecture. The contribution of local stakeholders is described in genuine detail and goes beyond consultation. The proposal contains no project risk table. Part III.B lists the categories that will be screened, but records no risk under any of them, assigns no level of significance, names no risk owner and specifies no mitigation measure or monitoring arrangement. The Project Risk Register is to be developed during inception, which means that there is no risk baseline against which the project can be appraised or subsequently monitored. The screening table at page 76 rates environmental and social risks by impact and likelihood, but it covers only those two categories, sits in Part III.C, and is not integrated into an overall risk framework. CAR 25: Kindly include a risk table in Part III.B identifying the major risks by category, with an assessed level of significance, the mitigation and monitoring measures for each, the party responsible, and the residual level after mitigation, drawing the environmental and social rows from the page 76 assessment so that the two are consistent. CR 15: In compiling the risk table, kindly consider a number of risks that are visible in the proposal but not yet treated as such. The results framework records several as assumptions rather than risks: that communities remain engaged, that policy approval is timely, that inter-agency collaboration holds, and that WUA formation proceeds, the last being expressly noted as voluntary although Output 3.1 and the operation and maintenance arrangements depend on it. On the financial side, the request sits exactly at the US$5 million ceiling with no contingency, so construction cost escalation on the five water supply and four irrigation schemes, exchange rate movement, and procurement capacity at Gewog level all carry consequences that cannot be absorbed within the grant. Delays in securing land consent and the environmental and forestry clearances would have the same effect. Please indicate how these are to be managed and reflect them in the risk table.

Are there measures in place for the management of environmental and social risks, in line with the Environmental and Social Policy and Gender Policy of the Fund? Do local actors contribute to developing and managing these measures?

Response: Not Cleared

Secretariat: CAR 26: The grievance mechanism is described only in the ESMP annex. The main proposal refers to it in general terms, but nowhere sets out the process itself. The ESP Guidance provides that the fully-developed project document will include a description of a grievance mechanism accessible to employees and affected communities. Kindly reflect the mechanism in the main proposal, covering entry points, the tiers and their timelines, how the mechanism is disclosed and in which languages, how anonymous and confidential complaints are handled, and how it is resourced. CR 16: The GAP allocation is phased at US$13,217, US$24,917, US$1,666 and nil across the four years, so it falls to a nominal amount in Year 3 and disappears in Year 4. The Gender Action Plan commitments, including women's representation in WUA leadership, sex-disaggregated monitoring and gender reporting, run through the full implementation period and into the operation and maintenance arrangements, and Year 4 is when the terminal evaluation and the handover to WUAs take place. The ESMP line is similarly phased at its lowest in Year 2, when construction is heaviest. Kindly revisit the phasing of both lines so that resources are available when the commitments fall due. Please also indicate where gender-responsive delivery is resourced within the component activities themselves. Notes 20 to 25 carry US$197,166 of capacity building with no gender-specific allocation, and no provision is visible for measures the proposal relies on elsewhere, such as separate consultations at times and locations that allow women to attend, women's leadership training within the WUAs, or the practical support needed to reach the 30% participation targets. CR 17: The safeguards and gender function is placed differently in three places: Section K states that an Environmental and Social Safeguards and Gender Specialist will oversee compliance and update the ESMP; the budgeted M&E plan places the Environmental and Social Safeguards and Gender Expert under the IE fee at US $50,000; and the ESMP assigns Tier 2 grievance handling to a PMU ESS and Gender Focal Point. The PMU staffing in budget note 27 includes no such post. Kindly confirm whether this is one position or two, where it sits institutionally, and to whom it reports, since the same person cannot both supervise Executing Entity compliance on behalf of the NIE and sit within the PMU as the entity being supervised (also see CR14). On IE supervision, the arrangements describe reporting flows but not the supervisory acts themselves. Please clarify whether NIE safeguards clearance or no-objection is required before physical works commence at each site, what independent verification the NIE will undertake beyond reviewing PMU reports, and what corrective action process applies where an Executing Entity is found non-compliant.

Is a budget on the Implementing Entity Management Fee use included?

Response: Not Cleared

Secretariat: Please see CAR 22 and kindly provide a breakdown of the Implementing Entity Management Fee, what is available is a budget note with a single narrative sentence listing categories with one total.

Is an explanation and a breakdown of the execution costs included?

Response: Not Cleared

Secretariat: Please see CAR 23 and provide a line-item breakdown of the execution costs, separating staffing from travel, office and IT costs, consultation and governance meetings, communication, and reporting, and reconcile the total with the US$374,200 in Table 3, the detailed budget and the disbursement schedule, since budget note 27 gives US$366,800. Please include provision for communication and for preparation of progress and financial reports, and clarify how financial management and procurement functions within the PMU are staffed and costed. CR 17: Capacity building appears within the execution cost while Component 3 carries US

$197,166 of capacity building across notes 21 to 25; and stakeholder consultations appear within the execution cost while consultation costs are also embedded in the Component 1 activity budgets, for example the five validation workshops at note 1 and the consultations at notes 2, 3, 4, 12 and 13. Kindly confirm what the execution cost element covers in each case so that it can be distinguished from the activity budgets.Please reconcile the minor differences between the budget notes and the detailed budget, where Component 2 appears as US$3,044,505 against US$3,044,504, Component 3 as US$322,417 against US$322,416, and note 21 as US $99,667 against US$99,666.

Is a detailed budget including budget notes included?

Response: Not Cleared

Secretariat: CAR27: Not Cleared. The budget is not yet internally consistent. The annual “Total Direct Cost” figures in the detailed budget do not correspond to the annual activity and output subtotals presented above them. Consequently, the disbursement schedule, which reproduces the same annual summary figures, does not reflect the expenditure profile shown in the activity-level budget. Please recalculate and reconcile the annual allocations and four-year totals across the activity-level budget, output and component subtotals, components and financing table, execution-cost and IE-fee schedules, budget notes, M&E budget and disbursement schedule. Please also correct all remaining arithmetic and rounding discrepancies, including the Component 2 total of USD 3,044,504 versus USD 3,044,505 in the budget notes; the Component 3 total of USD 322,416 versus USD 322,417; the execution costs of USD 374,200 versus USD 366,800; the IE fee of USD 354,230 versus USD 318,000; and the annual execution-cost, IE-fee and grand totals. Ensure consistent number formatting and punctuation throughout. Please revise the overall financing structure to distinguish clearly between: (i) project activities; (ii) project execution costs; (iii) total project cost comprising project activities and execution costs; (iv) the IE fee; and (v) the total amount requested. In particular, clarify and appropriately incorporate the USD 39,800 for GAP mitigation and USD 25,950 for ESMP implementation under the relevant project components and/or execution costs, rather than presenting them as separate additions outside the required cost structure. Confirm that these amounts do not duplicate safeguards, gender, monitoring or grievance-related costs included under the execution costs or IE fee. Given that Component 2 accounts for approximately 72% of the component budget, please provide adequate budget notes for each of the five drinking-water schemes and four irrigation schemes. For each scheme, provide a summarized cost breakdown and basis of estimate, including the main quantities and unit costs. Please identify the source and date of the rates used, including the applicable Bhutan Schedule of Rates, and ensure that the amounts are consistent with the completed surveys, designs and bills of quantities.

Are arrangements for monitoring and evaluation clearly defined, including budgeted M&E plans and sex-disaggregated data, targets and indicators, in compliance with the Gender Policy of the Fund? Do monitoring and innovation arrangement enable monitoring by the community and local actors (including by deploying innovative tools)?

Response: Not Cleared

Secretariat: The results framework at Part III.E states that all indicators are SMART and gender-responsive, but this is not borne out. Baselines are largely narrative rather than values and one is left as "to be established through baseline survey", with the framework stating that baseline values will be confirmed during inception. At fully-developed proposal stage the results framework is expected to carry baseline values for all indicators. Several targets are also unquantified. No time-bound milestones are given at indicator level. On the Gender Policy, only one of the twelve indicators is sex-disaggregated. The beneficiary target of 15,000 is not disaggregated, and there is no indicator tracking women's representation in WUA leadership despite the stated

intention to raise it from approximately 11% to at least 30%. Nor does the framework carry any indicator on environmental and social safeguards performance or grievance handling, although the M&E narrative commits to monitoring both. CAR 28: Kindly complete the baselines and targets, disaggregate by sex across the indicators where the data allow, add targets that reflect the commitments in the Gender Action Plan, and include indicators through which ESP and GAP compliance can be tracked. The projected calendar at Table 4 is also internally inconsistent. Project closing is given as June 2029, while implementation starts in January 2027 and the disbursement schedule, budgeted M&E plan and evaluation arrangements all run to December 2030, with the terminal evaluation in October 2030. Kindly correct the calendar so that the closing date, the evaluation dates and the four-year implementation period are consistent. CR 18: The community-based monitoring commitments in Part III.D, do not appear in the budgeted M&E plan or in any budget note. For a project under the LLA window, where monitoring by local actors is part of what the window is intended to demonstrate, kindly indicate where these tools are resourced, who maintains them after inception, and how the data they generate feed into the six-monthly safeguard reports and the annual performance report.

Does the M&E Framework include a break-down of how implementing entity IE fees will be utilized in the supervision of the M&E function?

Response: Not Cleared

Secretariat: CR 19: Two items appear to be allocated to two funding sources at once. The M&E plan records semi-annual monitoring missions at US$30,000 as included under the PMU, that is within execution costs, while budget note 28 lists M&E monitoring missions among the uses of the Implementing Entity management fee. Similarly, the annual learning and reflection workshops at US$20,000 are shown under the fee, while note 28 separately lists inception and dissemination workshops. Kindly confirm which budget bears each of these.

Does the project/programme's results framework align with the AF's results framework? Does it include at least one core outcome indicator from the Fund's results framework?

Response: Not Cleared

Secretariat: Please see CAR15, CAR16, CAR17 and CR11.

Is a disbursement schedule with time-bound milestones included?

Response: Not Cleared

Secretariat: CR 20: Please reconcile the total with the US$354,230 in Table 3 and the disbursement schedule, since budget note 28 (pp.97) gives US$318,000.



REQUEST FOR PROJECT/PROGRAMME FUNDING FROM THE ADAPTATION FUND

The annexed form should be completed and transmitted to the Adaptation Fund Board Secretariat by email or fax.

Please type in the responses using the template provided. The instructions attached to the form provide guidance to filling out the template.

Please note that a project/programme must be fully prepared (i.e., fully appraised for feasibility) when the request is submitted. The final project/programme document resulting from the appraisal process should be attached to this request for funding.

Complete documentation should be sent to the email: submissions@adaptation-fund.org

Acronyms & Abbreviations

AF	*Adaptation Fund*	***BSR***	*Bhutan Schedule of Rates*
ARDC	*Agriculture Research and Development Centre*	***COP***	*Conference of Parties*
BDWQS	*Bhutan Drinking Water Quality Standards*	***DA***	*Designated Authority*
BES	*Bhutan Ecological Society*	***DPRP***	*Drought Preparedness and Response Plan*
BHU	*Basic Health Unit*	***DTA***	*Department of Treasury and Accounts*
BTFEC	*Bhutan Trust Fund for Environmental Conservation*	***EE***	*Executing Entity*
BTN	*Bhutan Ngultrum*	***ESMP***	*Environmental and Social Management Plan*
CBMS	*Community-Based Monitoring System*	***GAP***	*Gender Action Plan*
CBMS	*Community-Based Monitoring System*	***GDP***	*Gross Domestic Product*
CCKP	*Climate Change Knowledge Portal*	***GIS***	*Geographic Information System*
CFFMG	*Community Forest Fire Management Group*	***GLOF***	*Glacial Lake Outburst Flood*
CIF	*Climate Investment Funds*	***IEE***	*Initial Environmental Examination*
CMIP5	*Coupled Model Intercomparison Project Phase 5*	***IFFCG***	*Inter-Agency Forest Fire Coordinating Group*
CR-RWSP	*Climate-Resilient Rural Water Safety Planning*	***IWRM***	*Integrated Water Resources Management*
DE	*District Engineer*	***KPI***	*Key Performance Indicator*
DECC	*Department of Environment and Climate Change*	***LLA***	*Locally Led Adaptation*
DLGDM	*Department of Local Governance and Disaster Management*	***M&E***	*Monitoring and Evaluation*
DMDF	*Department of Macro-Fiscal and Development Finance*	***MoAL***	*Ministry of Agriculture and Livestock*
DoA	*Department of Agriculture*	***MoF***	*Ministry of Finance*
DoFPS	*Department of Forests and Park Services*	***MoHA***	*Ministry of Home Affairs*
DoID	*Department of Infrastructure Development*	***MoIT***	*Ministry of Infrastructure and Transport*
DoW	*Department of Water*	***MTE***	*Mid-Term Evaluation*
DPO	*District Planning Officer*	***NAP***	*National Adaptation Plan*
EbA	*Ecosystem-based Adaptation*	***NCHM***	*National Center for Hydrology and Meteorology*
ESP	*Environmental and Social Policy*	***NDA***	*National Designated Authority*
ESS	*Environmental and Social Safeguards*	***NDC***	*Nationally Determined Contribution*
FGD	*Focus Group Discussion*	***NES***	*National Environment Strategy*
FNCRR	*Forest and Nature Conservation Rules and Regulations*	***NGEP***	*National Gender Equality Policy*
GAO	*Gewog Administrative Officer*	***NIE***	*National Implementing Entity*
GCF	*Green Climate Fund*	***NSSC***	*National Soil Service Centre*
GEF	*Global Environment Facility*	***PCM***	*Project Cycle Management*
GEF-LDCF	*Global Environment Facility – Least Developed Countries Fund*	***PHCB***	*Population and Housing Census of Bhutan*

GFFCG	*Gewog Forest Fire Coordinating Group*	***PMU***	*Project Management Unit*
GLOFs	*Glacial Lake Outburst Floods*	***PSC***	*Project Steering Committee*
GNH	*Gross National Happiness*	***RAA***	*Royal Audit Authority*
GRM	*Grievance Redress Mechanism*	***RBP***	*Royal Bhutan Police*
HDPE	*High Density Polyethylene*	***RCP***	*Representative Concentration Pathway*
ILK	*Indigenous Local Knowledge*	***SEP***	*Stakeholder Engagement Plan*
LDC	*Least Developed Country*	***SLM***	*Sustainable Land Management*
LOE	*Letter of Endorsement*	***TAC***	*Technical Advisory Committee*
MEAL	*Monitoring, Evaluation, Accountability and Learning*	***TE***	*Terminal Evaluation*
MoENR	*Ministry of Energy and Natural Resources*	***TWG***	*Technical Working Group*
RGoB	*Royal Government of Bhutan*	***WMD***	*Watershed Management Division*
UNFCCC	*United Nations Framework Convention on Climate Change*	***WSD***	*Water and Sanitation Division*
UWIFoRT	*Ugyen Wangchuck Institute for Forestry Research and Training*	***WUA***	*Water User Association*

ADAPTATION FUND

LOCALLY-LED ADAPTATION PROJECT/PROGRAMME PROPOSAL FOR SINGLE COUNTRY

PART I: PROJECT/PROGRAMME INFORMATION

Title of Project/Programme: Securing Water & Enhancing Climate Resilience in Thimphu (Rural) District, Bhutan.

Country: Bhutan

Thematic Focal Area: Water Management

Type of Implementing Entity: National Implementing Entity

Implementing Entity:
Bhutan Trust Fund for Environmental Conservation (BTFEC)

Executing Entities:

- Department of Water (DoW), Ministry of Energy and Natural Resources
- Department of Forests and Park Services (DoFPS), Ministry of Energy and Natural Resources
- Department of Agriculture (DoA), Ministry of Agriculture and Livestock
- Department of Infrastructure Development (DoID), Ministry of Infrastructure and Transport
- Department of Local Governance and Disaster Management (DLGDM), Ministry of Home Affairs
- Thimphu Dzongkhag Administration

Amount of Financing Requested: US$ 5,000,000 / (in U.S Dollars Equivalent)

Letter of Endorsement (LOE) signed: Yes

NOTE: The LOE should be signed by the Designated Authority (DA). The signatory DA must be on file with the Adaptation Fund. To find the DA currently on file check this page: https://www.adaptation-fund.org/apply- funding/designated-authorities

Stage of Submission:

☐ This proposal has been submitted before including at a different stage (pre-concept, **concept**, fully- developed proposal)
☐ This is the first submission ever of the proposal at any stage

In case of a resubmission, please indicate the last submission date: **18 January 2024**.

Please note that fully-developed proposal documents should not exceed 100 pages for the main document, and 100 pages for the annexes.

Official Use Only

Project / Programme Background and Context:

Provide brief information on the problem the proposed project/programme is aiming to solve. Outline the economic social, development and environmental context in which the project would operate.

The proposed project, **Securing Water & Enhancing Climate Resilience in Thimphu District, Bhutan**, aims to address several interrelated challenges faced by communities in Thimphu District, Bhutan. The Thimphu District's economic, social, and environmental context poses significant risks to water security and overall climate resilience, impacting the livelihoods and well-being of communities in Thimphu.

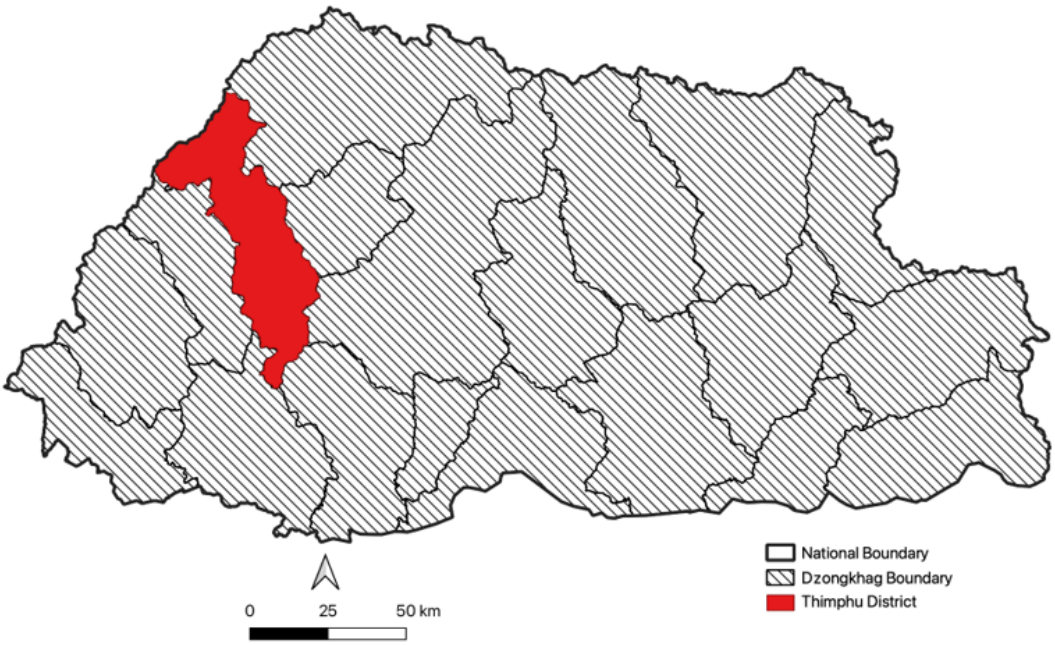


Figure 1Location of proposed project in the Thimphu District, Bhutan (Data Source: National Land Commission Secretariat, 2026)

Bhutan: Climate Change Challenges, Actions & Strategies

Bhutan, a least developed nation known for its commitment to environmental conservation and carbon neutrality faces significant vulnerability to the adverse impacts of climate change. As a landlocked and least developed country (LDC) characterized by a delicate mountainous environment, the nation's susceptibility is further compounded by its heavy reliance on predominantly subsistence agriculture and the pivotal role of hydropower in driving economic growth. The country is confronted with escalating climate hazards and extreme events, including flash floods, glacial lake outburst floods, windstorms, forest fires, and landslides. Increasingly, Bhutan faces challenges in maintaining pristine catchment areas, water availability and climate resilience in peri-urban regions. These areas are particularly vulnerable due to increasing urbanization, deforestation, and changing weather patterns. The combination of these factors results in reduced water availability, higher forest fire risks, and limited access to clean water for domestic and agricultural use[1].

Despite these challenges, Bhutan is committed to achieving its development goals while upholding the principles of Gross National Happiness and ecological balance. Realizing that climate change is one of the biggest impediments to sustainable development and livelihood of the people, Bhutan has committed to taking all measures to address the impacts of climate change. In 2009, at the UNFCCC COP15, Bhutan declared its intention to remain carbon neutral and reaffirmed its commitment in 2015 through its first Nationally Determined Contribution (NDC). Our constitutional mandate to maintain a minimum of 60% of the land area under forest cover for all times also has a global benefit for carbon sequestration. To maintain its carbon-neutral status,

[1] Climate Change Policy of the Kingdom of Bhutan, 2020. National Environment Commission. Royal Government of Bhutan.

Bhutan recognizes the necessity of mitigating emissions arising from economic expansion by pursuing low-emission development pathways across all sectors[2]. Further, Bhutan adopted a policy decision to pursue green growth through the Economic Development Policy of 2016.

In this context, Bhutan developed its Climate Change Policy in 2020 to provide strategic guidance to ensure that Bhutan remains carbon neutral and protects the well-being of the Bhutanese by adapting to climate change in an efficient and effective manner. The Climate Change Policy reaffirms Bhutan's unwavering commitment to remain carbon neutral, as pledged during the COP15 summit, and reiterated in its NDC under the Paris Agreement. This policy is designed to offer a clear roadmap for achieving a climate-resilient and carbon-neutral economy that contributes to the nation's overarching goal of promoting Gross National Happiness. Furthermore, the policy seeks to tackle challenges and leverage opportunities, including securing international support in the form of financial aid, technology transfer, capacity building, research, and awareness initiatives on climate change at both the national and international levels. By fostering collaboration, inclusivity, and innovative approaches, the policy endeavors to safeguard Bhutan's distinct environmental heritage while actively contributing to global endeavors in combating climate change. This inclusive approach entails the active participation of public-private sectors to collectively address for a more climate resilient future.[3]

To further balance conservation with development and enhance implementation and operationalization of the existing legislation in all spheres of government, down to the local level, Bhutan developed the National Environment Strategy (NES) 2020-2030. The primary objective of the National Environment Strategy is to establish a thriving and sustainable environment that caters to the well-being of current and future generations, aligning with the pursuit of Gross National Happiness. Notably, the strategy is committed to maintaining carbon neutrality, advocating for environmentally friendly and climate-resilient roads and infrastructure. Furthermore, it aims to foster sustainable and climate-resilient agricultural practices.[4]

In 2023, Bhutan launched its National Adaptation Plan (NAP), which serves as a guiding framework for climate change adaptation planning at the national level. The NAP sets clear priorities, primarily aimed at reducing exposure and vulnerability to climate-related hazards, while simultaneously enhancing adaptive capacity. Additionally, the plan is aimed at enhancing implementation through integration into development plans at all levels. The NAP is also intended to convey the priorities and needs for adaptation in Bhutan internationally.[5]

These foundational policies and strategic documents for climate change action in the country outline the necessary conditions for effectively implementing prioritized adaptation measures.

Socio-economic Scenario: Challenges, Progress and Future Perspectives

Socio-economic Context of Bhutan

Bhutan's economy, one of the smallest in the world, was badly affected by the COVID-19 pandemic. The GDP dropped to BTN 171,572.90 billion (USD 2,344.05 million) in 2020 from 178.56 billion, from 2019, which is a contraction of BTN 6.99 billion. The GDP recorded a negative growth of 10.08% in 2020 compared to growth of 5.75% in 2019.[6] The latest figures show that the key contributing economic sectors to the GDP are: i) the primary sector (agriculture, livestock and forestry (14.67% of GDP), ii) secondary sector (industry), 31.82%, and iii) tertiary sector (services), 53.50%.[7]

[2] Intended Nationally Determined Contribution of the Kingdom of Bhutan, 2015. National Environment Commission. Royal Government of Bhutan, Thimphu.

[3] Climate Change Policy of the Kingdom of Bhutan, 2020. National Environment Commission. Royal Government of Bhutan.

[4] National Environment Strategy, 2020. National Environment Commission Secretariat. Royal Government of Bhutan.

[5] National Adaptation Plan (NAP) for the Kingdom of Bhutan 2023. Department of Environment and Climate Change, Royal Government of Bhutan, Thimphu.

[6] National Accounts Statistics 2021. National Statistics Bureau. Royal Government of Bhutan.

[7] National Accounts Statistics 2023, National Statistics Bureau, Royal Government of Bhutan.

The renewable natural resources sector remains the most important economic sector for employment, with 49.90% of the total employed persons engaged in the agriculture sector, followed by the service sector that employs 36.60% of the total employed persons. Tourism is a key component of the service sector which makes a significant contribution to the country's economy particularly in terms of foreign exchange and employment. The colossal economic shock due to the COVID-19 pandemic has impacted the performance of all sectors but has had particularly devastating impact on tourism and related sectors[8].

Bhutan's estimated population in 2023 reached around 787,424 (401,092 males and 369,184 females), with ~20% of the population residing in the capital Thimphu. The working-age population of Bhutan is estimated at 496,600, with an employment rate of 96.6%. Of the total employed (~300,400), 71.2% (~214,200) are in rural areas and 28.7% (~86,200) in urban areas. Population projections show that Bhutan will grow to about 883,900 people by 2047, indicating an annual growth rate of less than 0.3%. The current proportion of the population living in rural areas (59%) is expected to decrease to 43% by 2047, with 30% of the total population expected to be residing in Thimphu[9].

Utilizing a poverty line at BTN 2,195.95 (USD 33.82) per person per month (approximately a dollar a day), an estimated 8.2% of the population is found to be poor, an impressive reduction over the last twenty years from 32%. Poverty in rural areas (11.9%) is significantly higher than in urban areas (0.8%). The highest poverty rates are observed in five districts namely Dagana, Zhemgang, Mongar, Trongsa, and Pema Gatshel. While the Gini index, which measures inequality, has remained constant at the national level (0.36 in 2012 and 0.38 in 2017), a marked disparity in aggregate simple literacy can be observed between the poor and non-poor, especially those living in urban areas[10]. While the contributing factors for poverty are diverse and multi-sectoral, few prominent attributes identified in the Bhutan Poverty Analysis 2017 are: access to market, connection to road networks, topography of the farmland, access to irrigation and drinking water. Areas with high incidences of poverty tend to have low access to markets and poor connection to road networks, slope to steep topography of farmland leading to low productivity, low number of productive livestock, large incidence of human-wildlife conflict, low access to irrigation water, and drinking water.

The proposed project thus includes the most vulnerable communities, targeting the poorer and more economically and environmentally vulnerable communities of Thimphu district for all interventions. This adaptation project aims to enhance access to irrigation and drinking water in rural and local communities of Thimphu district to increase economic resilience and adapt to climate change.

Bhutan is blessed with an exceptional natural environment, earning it the title of the 'crown jewel' of the Eastern Himalayas, a region recognized as a global biodiversity hotspot[11]. The country boasts an impressive 69.71% forest cover[12] and 51.44% of its land designated as protected areas[13], which has played a crucial role in preserving its rich biodiversity and ensuring ample water resources.

Thanks to its extensive forest cover, limited polluted industrial activities, and a significant reliance on hydropower for electricity generation, Bhutan stands out as possibly the only nation in the world with negative

[8] Annual Report 2020-21, Tourism Council of Bhutan, Royal Government of Bhutan.

[9] Population Projections Bhutan 2017-2047, National Statistics Bureau, Royal Government of Bhutan

[10] Poverty Analysis Report 2017, National Statistics Bureau, Royal Government of Bhutan

[11] Jewel of the Eastern Himalayas. WWF Bhutan 2010.

[12] National Forest Inventory Volume I: State of the Forest Report, Department of Forests and Park Services, Royal Government of Bhutan.

[13] Annual Forestry Statistics,2022. Department of Forest and Park Services, Royal Government of Bhutan.

carbon emissions[14,15]. However, despite this positive environmental record, Bhutan is not immune to the impacts of global warming and climate change, and these challenges still affect the country's ecosystems and mostly our local communities.

Bhutan is renowned for its abundant water resources in the region, boasting one of the highest reported water availability per capita[16]. Despite this, the country still grapples with water accessibility issues that persist throughout the nation. This situation arises from a combination of factors, primarily driven by the impacts of climate change, leading to the drying up of water sources. The most imminent threat that Bhutan faces due to the impact of climate change is the risks from the Glacial Lake Outburst Floods (GLOFS). Bhutan had experienced a total of 21 GLOFs in the past. GLOFs cause cascading effects downstream, destroying water-related infrastructure, loss of properties, and livelihoods downstream. Bhutanese glaciers are also retreating at a faster rate due to the impacts of climate change. A total of 567 glacial lakes covering a total area of 55.04 ±.0.055 km^2 or 0.14% of the total land area, has been mapped by the National Center for Hydrology and Meteorology.[17] Furthermore, inadequate infrastructure development and maintenance, along with governance-related challenges, contribute to the paradox of high-water availability but limited accessibility in the country.

Development Context

Bhutan's commitment to sustainable development and environmental conservation is embodied in its Gross National Happiness (GNH) philosophy. GNH values collective happiness as the goal of governance, by emphasizing harmony with nature and traditional values as expressed in the and 4 pillars (sustainable and equitable socio-economic development; environmental conservation; preservation and promotion of culture; and good governance) and 9 domains (psychological well-being, health, time use, education, cultural diversity and resilience, good governance, community vitality, ecological diversity and resilience, and living standard)[18]. However, due to rapid urbanization, infrastructure development and increased climate-related risks have emerged. Unplanned urban growth, deforestation, and inadequate water management exacerbate the vulnerability of peri-urban areas to environmental degradation and climate change impacts.

Socio-economic Context of Thimphu District

Thimphu district has one of the lowest poverty rates of 1.5 % compared to all other districts[19].The poverty rate however has increased by 0.4% in 2022, compared to the poverty rate of 1.1% in 2017[20]. This indicates that while urban poverty is an emerging social issue, poverty is relatively a rural phenomenon. Thimphu district serves as the economic hub of Bhutan, attracting urbanization and industrialization. The rapid urbanization of the city has had a ripple effect on and aided in the economic growth of the rest of the district. At the same time, several negative impacts such as unemployment, crime, air pollution, cultural deterioration, housing and water shortages, congestion and increasing waste problems especially in the city keep swelling in the district[21]. The increasing population and economic activities have led to higher water demand for both domestic and industrial needs. Further, unsustainable land use practices, deforestation, and urban expansion have contributed to the degradation of catchment areas, leading to reduced water availability for agricultural and domestic use[22]. Water

[14] Bhutan the First Carbon negative Country in the world August 18,2022. Retrieved on 10th January 2023 from https://earth.org/bhutan-carbon-negative-country/

[15] Third National Communication to the UNFCCC 2020. Kingdom of Bhutan. National Environment Commission.

[16] National Environment Commission. *Bhutan State of the Environment Report 2016*; National Environment Commission: Thimphu, Bhutan, 2016.

[17] Bhutan Glacial Lake Inventory 2021: National Center for Hydrology and Meteorology, Royal Government of Bhutan.

[18] www.grossnationalhappiness.com/.

[19] National Statistics Bureau of Bhutan (2022). Bhutan Poverty Analysis Report. National Statistics Bureau of Bhutan. Royal Government of Bhutan.

[20] National Statistics Bureau of Bhutan (2017). Bhutan Poverty Analysis Report. National Statistics Bureau of Bhutan. Royal Government of Bhutan.

[21] 12th Five Year Plan for Thimphu District (2018-2023). Gross National Happiness Commission.

[22] Giri, N., & Singh, O. P. (2013). Urban growth and water quality in Thimphu, Bhutan. Journal of Urban and Environmental Engineering, 7(1), 82-95.

scarcity affects agricultural productivity and poses challenges for small-scale farmers who heavily rely on irrigation for their livelihoods.

Thimphu District experiences rapid population growth, as rural communities migrate to urban and peri-urban areas seeking better economic opportunities. The Dzongkhag has the highest unemployment rate in the country with 6.0% against the national average of 2.4%[23]**.** The high rate of unemployment is attributed to high level of rural-urban migration to Thimphu mostly youth; the Dzongkhag has the highest proportion of population who were migrants with 84.92[24].
This demographic shift puts pressure on existing water resources and infrastructure, leading to competition for water among various user groups.[25] Furthermore, the availability of clean drinking water is not evenly distributed, leading to disparities in access, particularly for marginalized communities. Women, who often bear the responsibility of water collection, face increased burdens and time constraints in securing water for their families.

Climate Trends and Climate Change Threats

Climate - Historical Trends

Bhutan's climate is diverse, owing to the dramatic variations in elevation and topography. In general, temperature increases have been experienced in Bhutan, with minimum temperatures increasing at a faster rate than maximum temperatures. An analysis of trends in climate parameters using CRU data for the country from 1976 to 2005 showed an increasing trend in temperature. The mean annual temperature has increased. by 0.8 degrees Celsius for the 1976 to 2005 period[26]. Temperatures are higher during summer and lower over winter months. As shown in Figure 2, there is a significant seasonal range in temperatures: the summer months of June–August averaging temperatures of 24 C–29 C, compared to the winter months of December–February which are near 0°C, for the most recent climatology, 1991–2020. Average monthly rainfall follows a similar pattern, in which considerably more rainfall occurs during the summer months (approximately 240 millimeters [mm]) than during the winter months (approximately 90 mm). Southern parts of the country with lower elevation tend to have higher temperatures and greater precipitation, while northern regions are often cooler with less precipitation.[27]

[23] Population and Housing Census Report of Bhutan 2017. Thimphu Dzongkha. National Statistical Bureau, 2018. Royal Government of Bhutan.

[24] Center for Bhutan Studies and GNH Research 2015. A Compass Towards a Just and Harmonious Society :2015 GNH Survey Report. Center for Bhutan Studies and GNH Research.

[25] Giri, N., & Singh, O. P. (2013). Urban growth and water quality in Thimphu, Bhutan. Journal of Urban and Environmental Engineering, 7(1), 82-95.

[26] NCHM (2019). Analysis of Historical Climate and Climate Projection for Bhutan. National Center for Hydrology and Meteorology Royal Government of Bhutan,Thimphu.

[27] Climate Risk Country Profile: Bhutan (2021): The World Bank Group and the Asian Development Bank.

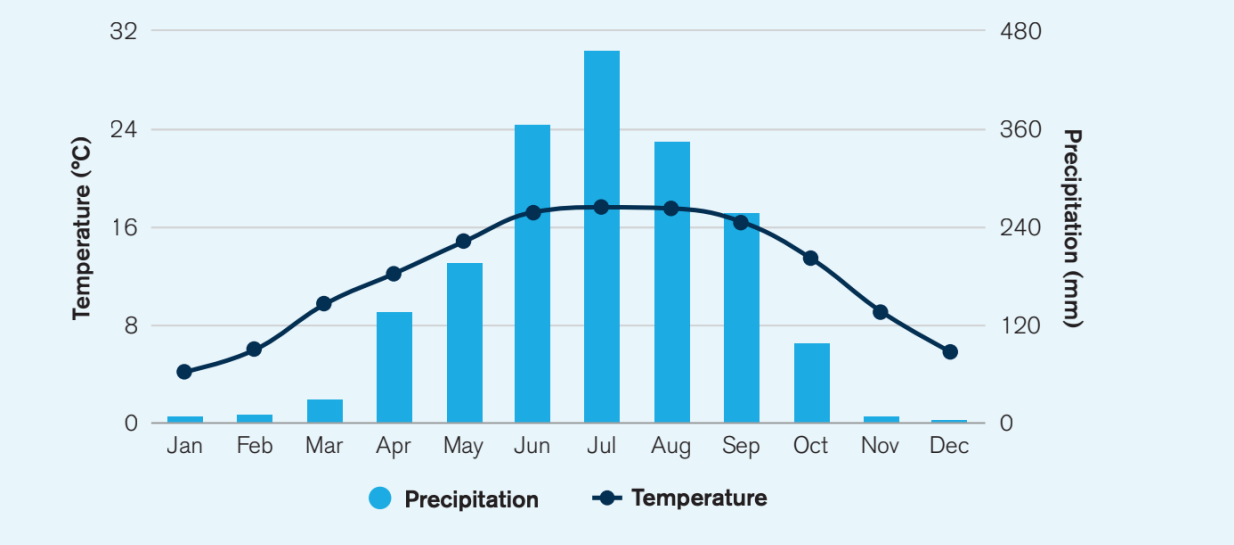


Figure 2 Average monthly temperature and rainfall in Bhutan (1991-2020).[28]

The southwest monsoon over the Indian sub-continent produces a seasonal precipitation cycle in Bhutan, with rainy summer seasons over most of the country from June to September. However, Bhutan experiences a high degree of rainfall variability and distribution spatially.[29] The analysis of historical data revealed a decreasing trend in rainfall at mean annual scales with high variability. Seasonal rainfall trends reveal a wet summer monsoon (JJAS) and dry winter season (DJF)[30].

Climate of Thimphu

Thimphu has a temperate climate with winter temperatures ranging from -2.6 C to 12.3 C and summer temperatures range from 21.6 C to 32 C. The annual rainfall of Thimphu varies between 500 mm and 1000 mm.[31] Historical climate of Thimphu also follows the general trend observed for Bhutan as a whole. The mean summer temperatures are higher and winter temperatures are lower (Figure 3).

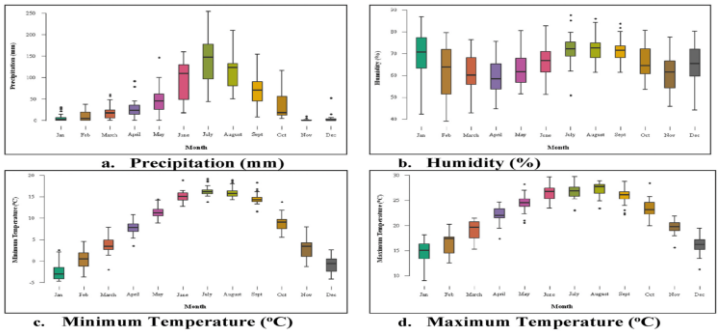


Figure 3 Mean of monthly climatic parameters of Thimphu (Simtokha Climate Station data 1995-2020)[32]

[28] WBG Climate Change Knowledge Portal (CCKP, 2021). Climate Data: Historical. URL:https://climateknowledgeportal.worldbank.org/country/bhutan/climate-data-historical

[29] Stewart, S.B., Choden, K., Fedrigo, M., Roxburgh, S.H., Keenan, R.J. and Nitschke, C.R. (2017). The role of topography and the north Indian monsoon mean monthly climate interpolation within the Himalayan Kingdom of Bhutan. International Journal of Climatology, 37, pp. 897–909. URL: https://rmets.onlinelibrary.wiley.com/doi/full/10.1002/joc.5045

[30] NCHM (2019). Analysis of Historical Climate and Climate Projection for Bhutan. National Center for Hydrology and Meteorology, Royal Government of Bhutan,Thimphu

[31] Walcot, S. (2009) "City Profile: Thimphu". Cities 26:158-170

[32] Pandey et. al; (2023). Attributable factors for climate change adaptation among urban informal settlers of a least developed country, Bhutan, Habitat International, Volume 136, 2023 https://doi.org/10.1016/j.habitatint.2023.102817

Future Climate

Mountainous countries such as Bhutan are among the most vulnerable countries to the adverse impacts of climate change. Under the RCP 4.5 scenario, the climate projection for surface temperature indicates an increase of about 0.8 C – 1.6 C during 2021-2050 (representing the 2030s mid-term climate change scenario) and about 1.6 C – 2 C towards the end of the century (2070-2099).[33] Projections of temperature rise in Bhutan are slightly greater than the global average: 3.9 C compared to 3.7 C by the 2090s under the highest emissions pathway, RCP 8.5.[34]

Table 1 Projected anomaly (changes °C) for maximum, minimum, and average daily temperatures in Bhutan for 2040–2059 and 2080–2099, from the reference period of 1986–2005 for all RCPs. The table shows the median of the CCKP model ensemble and the 10–90th percent

	Average Daily Maximum Temperature		Average Daily Temperature		Average Daily Minimum Temperature	
Scenario	**2040–2059**	**2080–2099**	**2040–2059**	**2080–2099**	**2040–2059**	**2080–2099**
RCP2.6	1.3 (–0.6, 3.5)	1.3 (–0.6, 3.4)	1.3 (–0.1, 2.8)	1.2 (0.0, 2.9)	1.2 (–0.3, 3.2)	1.3 (–0.4, 3.2)
RCP4.5	1.7 (–0.3, 3.7)	2.5 (0.3, 4.8)	1.6 (0.2, 3.0)	2.4 (0.8, 4.0)	1.7 (0.0, 3.6)	2.3 (0.8, 4.5)
RCP6.0	1.5 (–0.6, 3.6)	2.8 (0.6, 5.2)	1.5 (0.1, 3.0)	2.8 (1.3, 4.5)	1.6 (–0.2, 3.4)	2.9 (1.2, 5.0)
RCP8.5	2.3 (0.2, 4.2)	4.7 (2.4, 7.0)	2.2 (0.8, 3.6)	4.5 (2.8, 6.5)	2.2 0.7, 4.0)	4.6 (2.8, 7.1)

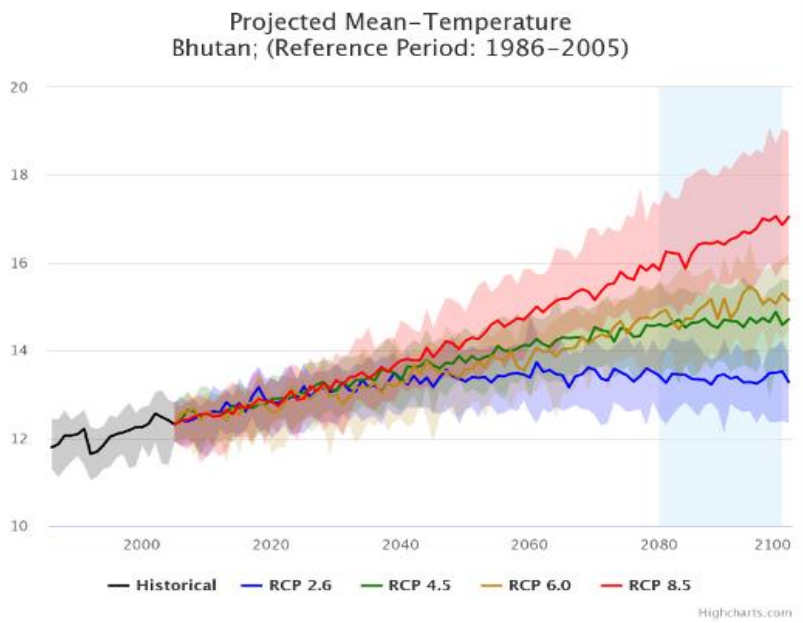


Figure 4 Historic and projected average annual temperature in Bhutan under various RCPs estimated by the model ensemble. Shading represents the standard deviation of the model ensemble.[35]

[33] The World Bank Group and the Asian Development Bank (2021). Climate Risk Country Profile-Bhutan

[34] WBG Climate Change Knowledge Portal (CCKP, 2021). Climate Data: Historical. URL https://climateknowledgeportal.worldbank.org/country/bhutan/climate-data-historical

[35] *WBG Climate Change Knowledge Portal (CCKP, 2021). Climate Data: Projections. URL: https://climateknowledgeportal.worldbank.org/country/bhutan/climate-data-projection*

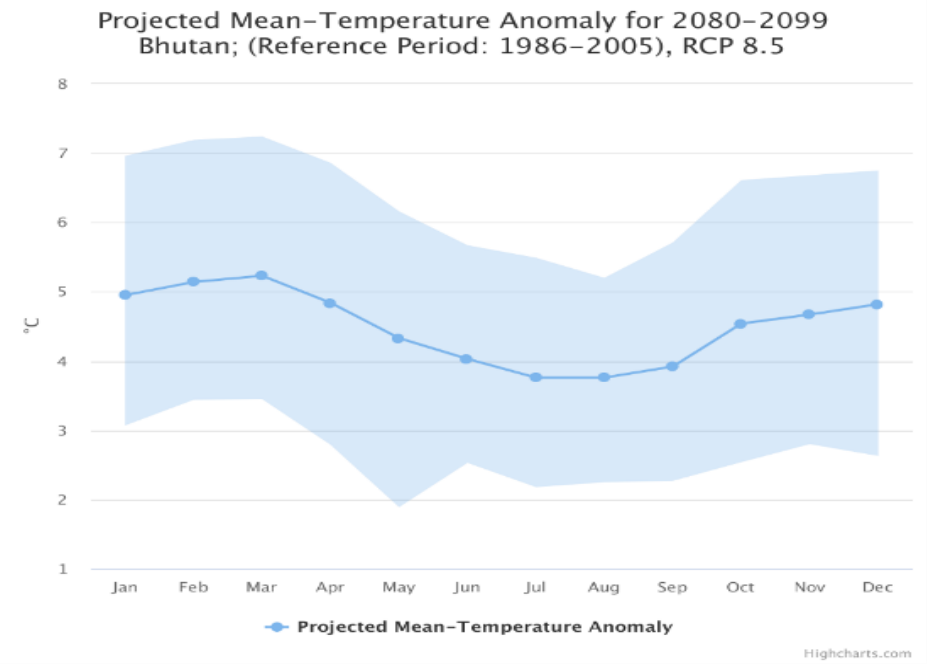


Figure 5 Projected change (anomaly) in monthly temperature, shown by month, for Bhutan for the period 2080–2099 under RCP 8.5. The value shown represents the median of the model ensemble with the shaded areas showing the 10th–90th percentiles.[36]

Projected precipitation trends, although less certain, show a likely increase in precipitation for the country, with eastern areas experiencing higher amounts of rainfall. However, it is anticipated that Bhutan will experience an increase in intensity for extreme rainfall events.[37] Spatial representation of future projections of annual temperature and precipitation for mid and late century under RCP 8.5 are presented in the figures below. Under all emissions pathways, an increase in the precipitation associated with a maximum 5-day rainfall event is expected across Bhutan, with heaviest rainfall occurring in the southeastern areas of the country.

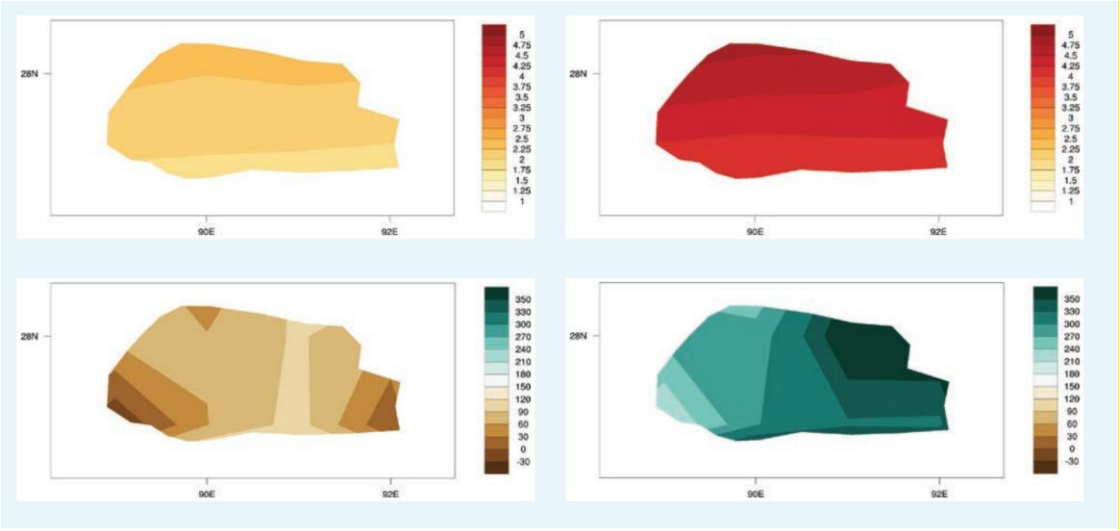


Figure 6 CMIP5 ensemble projected change (32 GCMs) in annual temperature (top) and precipitation(bottom) by 2040–2059 (left) and by 2080–2090 (right) relative to 1986–2005 baseline under RCP 8.5.[38]

[36] *Ibid*

[37] Climate Risk Country Profile: Bhutan (2021): The World Bank Group and the Asian Development Bank.

[38] *WBG Climate Change Knowledge Portal (CCKP, 2021). Climate Data: Projections. URL: https://climateknowledgeportal.worldbank.org/country/bhutan/climate-data-projection*

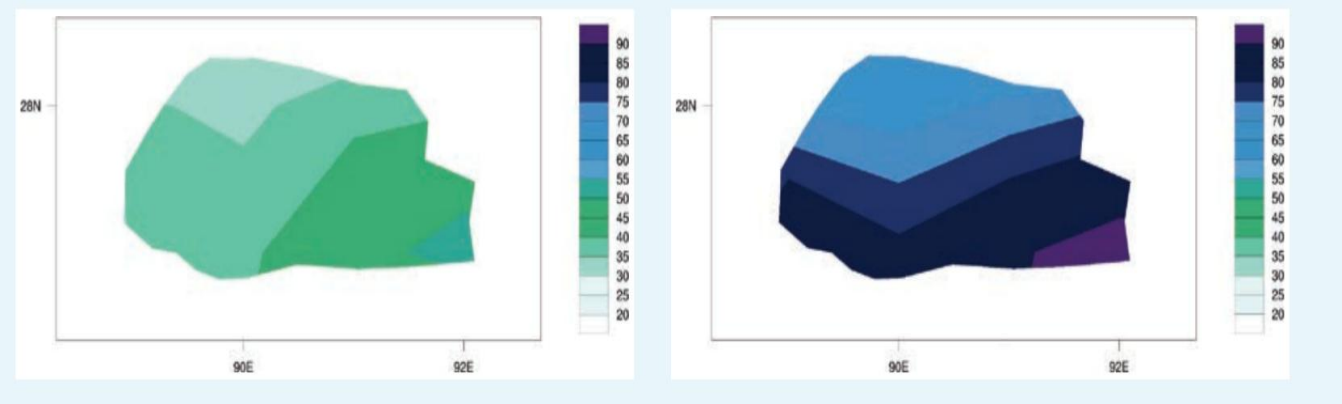


Figure 7. Projected change in the maximum 5-day rainfall (mm) over Bhutan for the period 2040–2059 (left) and for the period 2080–2099 (right) for emissions pathways RCP 8.5 compared to the 1986–2005 baseline.

All these climatic changes are expected to have devastating effects on agriculture, Bhutan having already experienced the effects of climate change on agriculture multiple times. In 1996, rice farmers in high-altitude areas were devastated with 80–90% crop loss to blast disease. Turcicum leaf blight of maize in 2007 damaged more than 50% of the farmers' harvest. Also, in 2008, a severe windstorm destroyed all maize crops belonging to hundreds of households.[39]

Due to large topographical differences accompanied by huge altitudinal variation, erratic climatic natural hazards—such as glacier lake outburst floods (GLOF), flash floods, erosions, and landslides—are predicted to intensify in the future.[40] Thimphu, the most populated capital city, is expected to experience more frequent and intense forest fires, posing risks to water catchment areas and disrupting the delicate ecological balance as a result of impacts of climate change[41]. Climate change-induced shifts in precipitation patterns may further exacerbate water scarcity in Thimphu, impacting households, agriculture and ecosystems. Thus, Thimphu district, one of the most populated districts, will be increasingly vulnerable to the impacts of climate change.

Natural Hazards Related to Climate Change

Bhutan is vulnerable to a range of natural disasters, including floods, earthquakes and landslides. Bhutan faces risks from natural disasters but relatively less than other countries, ranking joint 115th out of 191 countries in the INFORM 2019 Risk Index[42]. The most significant natural hazard is exposure to earthquakes, due to location along the Himalayan Mountain belt. Amongst the climate-related hazards, flooding is the country's most significant hazard, ranking 76th globally. The risks associated with other climate-related natural hazards such as drought and tropical cyclones, are extremely low, both scoring 0 on the INFORM 2019 Index.[43]

Flooding and GLOFs

Climate change-induced erratic rainfall patterns with the heavy showers during monsoon, and rapid retreating of glaciers, have increased the probability of flash floods and GLOF in the river catchments areas. Examples of such disasters are, GLOF in Punakha (1994), and floods in Gelephu because of the rise in Mao Chhu with heavy rainfall. Bhutan has faced over 21 GLOFs and frequent occurrences of floods and landslides every year. These disasters have damaged agricultural land, public properties, institutions and took many lives. The risk of GLOF is pronounced in northern parts of Bhutan, which possesses 667 glaciers that feed into 2,6774 glacial

[39] Chhogyel, N., Kumar, L. Climate change and potential impacts on agriculture in Bhutan: a discussion of pertinent issues. *Agric & Food Secur* 7, 79 (2018). https://doi.org/10.1186/s40066-018-0229-6

[40] Shrestha et al (2010) Climate Change in the Eastern Himalayas: Observed Trends and Model Projections; ICIMOD: Kathmandu, Nepal; p. 20.

[41] UNDP (2021). Assessment of climate risks on forests and biodiversity for National Adaptation Plan (NAP) formulation process in Bhutan. UNDP, Thimphu, Bhutan.

[42] European Commission (2019). INFORM Index for Risk Management. Bhutan Country Profile. URL: https://drmkc.jrc.ec.europa.eu/inform-index/Countries/Country-Profile-Map

[43] *Ibid*

lakes, out of which, 25 are at risk of bursting. The impact of flooding on human health and livelihoods is expected to grow and could be 4% of GDP by the 2030s.[44]

A recent climate risk assessment on water resources in Bhutan also identified Thimphu district as a hotspot susceptible to water-related hazards such as flash floods, landslides, rainstorms, hailstorms, soil erosion, and river flooding.[45] Higher temperatures are projected to also contribute to increased snowmelt which could change patterns of river discharge and water availability. Impacts on infrastructure could grow significantly in the second half of the 21st century.[46]

Droughts

In addition to flooding, climate models project a significant increase in the likelihood of heatwaves and droughts, impacting the communities in Bhutan's inner dry valleys. The dry spell classification of the country identified Thimphu as one of the drought prone areas due to its relatively drier climate. By the 2090s, the current median probability of heatwave of 2% is projected to increase to approximately 20% under RCP 4.5 and RCP 6.0, and as high as 36% under RCP 8.5 under the Coupled Model Inter- comparison Project Phase 5 (CMIP5) projections.[47]

Fires

Forest fires are considered one of the biggest threats to forest resources in Bhutan.[48] Blue pine ecosystems are of high concern because of their importance for rural livelihoods and relatively high occurrence of forest fires. Blue pine forests are the most dominant forest type in Thimphu district. Blue pine are species native to the Himalayas and are prone to fire incidents. Younger trees, with their thin bark and high flammability, are particularly susceptible to wildfire-induced mortality.[49] Blue pine is considered an early successional species and tends to grow in proximity to human settlements, often on abandoned farmland. Due to their close association with settlements, these blue pine forests are subject to considerable human impact, including demands for forest ecosystem services like timber, firewood, and livestock forage. Additionally, they face an elevated risk of wildfires caused by human activities,[50,51,52] and further aggravated by climate change.

A study by Villarel et al, 2020 showed that blue pine ecosystems in Thimphu are more susceptible to wildfires compared to other areas. The study also predicted that under extreme weather conditions, fire hazards in northern and southern Thimphu would experience a two-fold increase. Thimphu showed a higher potential for more intense and severe wildfires under all future climate scenarios.[53]

A report by UNDP (2021) highlighted that under extreme climatic changes, Thimphu would experience increased fire hazards. Forest fires in Bhutan continue to take a substantial toll on wildlife and biodiversity with

[44] National Centre for Hydrology and Meteorology (n.d.). Compendium of climate and hydrological extremes in Bhutan since 1968 from Kuensel.

[45] Department of Water, 2023.Assessment of Climate Risks on Water Resources for National Adaptation Plan (NAP) for Bhutan. October 2023. Department of Water, Royal Government of Bhutan.

[46] *Ibid*

[47] The World Bank Group and the Asian Development Bank (2021). Climate Risk Country Profile-Bhutan

[48] Chhetri, D. 1994. Seasonality of forest fires in Bhutan. International Forest Fire News, 10, 5-9.

[49] ibid

[50] Dukpa, D., Cook, E.R., Krusic, P.J., Rai, P., Darabant, A., Tshering, U., 2018. Applied dendroecology informs the sustainable management of Blue Pine forests in Bhutan. Dendrochronologia 49, 89–93. https://doi.org/10.1016/j.dendro.2018.03.003

[51] Gyeltshen, C., Gratzer, G., Meigs, G., & Keeton, W. (2016). *Fire risks in blue pine forests of Bhutan* (Doctoral dissertation, Master thesis, University of Natural Resources and Life Sciences (Boku), Vienna, Austria)

[52] Tenzin, K. (2001). The Management of Blue Pine (*Pinus wallachiana)* in Secondary Forest in Bhutan (Doctoral dissertation, University of Edinburgh).

[53] Vilà-Vilardell, L. et al. 2020. Climate change effects on wildfire hazards in the wildland-urban-interface– Blue pine forests of Bhutan. Forest Ecology and Management, 461, 117927.

annual fire incidences averaging about 57 events and scarring an average of about 200 ha annually.[54] The districts experiencing the highest incidence of fires include Thimphu, Wangdue Phodrang, Punakha, Mongar, Lhuentse, and Trashigang.

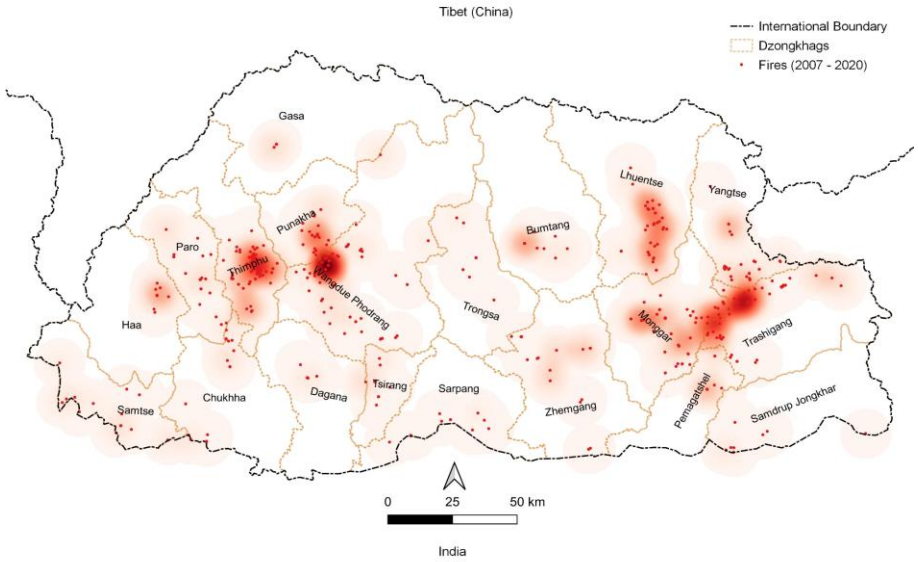


Figure 8. Fire occurrence locations (2007 -2020) and current fire risk zones. Darker shades correspond to higher fire occurrences and more area burnt.[55]

Current fires are mostly concentrated in the chir pine and blue pine zones forests, with occasional fires within sub-tropical broadleaved forests. Model projections under future climatic scenarios also indicate that chir pine, blue pine and mixed conifer forests will be the most impacted. Concurrently, Kawang and Mewang *gewogs* (Sub-district)[56] under Thimphu *dzongkhag (Block),*[57] are at most risk from fire hazards within the blue pine forests zone.[58]

54 UNDP (2021). Assessment of climate risks on forests and biodiversity for National Adaptation Plan (NAP) formulation process in Bhutan. UNDP, Thimphu, Bhutan.

55 *Ibid*

56 Referred to Sub-district/block in Bhutan

57 Bhutanese term for District.

58 UNDP (2021). Assessment of climate risks on forests and biodiversity for National Adaptation Plan (NAP) formulation process in Bhutan. UNDP, Thimphu, Bhutan.

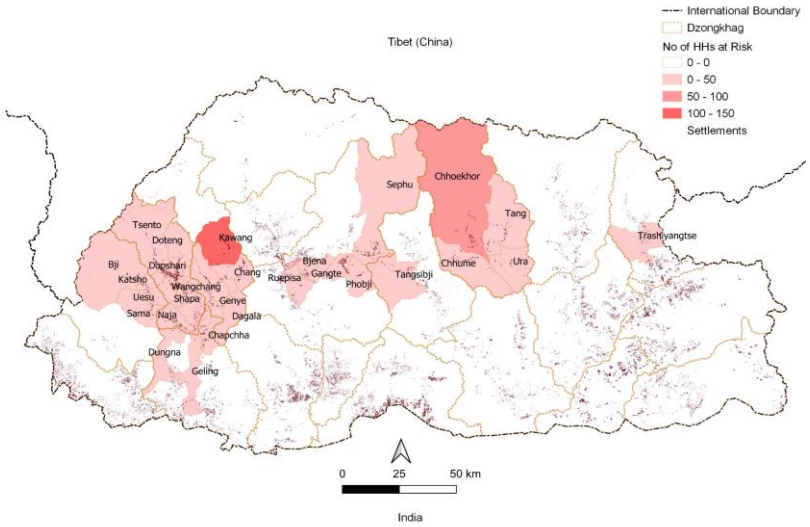


Figure 9. Households most at Risk in Blue Pine Forests RCP 4.5 now until 2050.[59]

Impact of Climate Change on Agriculture

Climate change impacts on agriculture in Bhutan

Agriculture in Bhutan is highly vulnerable to climatic conditions due to its dependence on monsoon rains and short growing periods. Climate change is likely to influence food production due to alterations to carbon dioxide concentration, precipitation and temperatures.[60] This is accentuated by the structure of agricultural production and concentration of agricultural activity in vulnerable areas. Around 30% of agricultural production takes place on slopes that are vulnerable to landslides and soil erosion. Only 2.93% of the total area of Bhutan constitutes arable agricultural areas, which renders the agriculture sector more vulnerable to the impacts of climate change.[61]

With climate change, agro-biodiversity loss (about 30% of traditional crop varieties are lost already in Bhutan)[62] as well as incidences of pests and diseases are expected to increase along with a worsening of water-related issues.[63] Soil erosion, aridification and change in soil organic matter will further impact the agriculture production. Diminishing snow cover will add to the growing water woes across Bhutan.[64] Additionally, crop and livestock loss to wildlife continues to take a significant toll on farmers' economic productivity and psychosocial well-being.[65]

59 UNDP (2021). Assessment of climate risks on forests and biodiversity for National Adaptation Plan (NAP) formulation process in Bhutan. UNDP, Thimphu, Bhutan.

60 Behera, B., Haldar, A. & Sethi, N. Agriculture, food security, and climate change in South Asia: a new perspective on sustainable development. *Environ Dev Sustain* (2023). https://doi.org/10.1007/s10668-023-03552-y

61 NSSC, PPD. Bhutan land cover assessment 2010—technical report. Thimphu: NSSC and PPD, Ministry of Agriculture and Forests; 2011.

62 Katwal, T.B.; Dorji, S.; Dorji, R.; Tshering, L.; Ghimiray, M.; Chhetri, G.B.; Dorji, T.Y.; Tamang, A.M. Community Perspectives on the On-Farm Diversity of Six Major Cereals and Climate Change in Bhutan. *Agriculture* **2015**, *5*, 2-16. https://doi.org/10.3390/agriculture5010002

63 Sivakumar, M. V., & Stefanski, R. (2011). Climate change in South Asia. In *Climate change and food security in South Asia* (pp. 13-30). Springer, Dordrecht

64 Gurung, D. R., Kulkarni, A. V., Giriraj, A., San Aung, K., & Shrestha, B. (2011). Monitoring of seasonal snow cover in Bhutan using remote sensing technique. *Current Science*, 1364-1370.

65 Barua, M., Bhagwat, S. A., & Jadhav, S. (2013). The hidden dimensions of human–wildlife conflict: health impacts, opportunity, and transaction costs. *Biological Conservation*, *157*, 309-316.

Climate projections suggest that the annual growing season length could increase by an estimated 25.9 days by the end of the century, primarily in northern regions.[66] It is also projected that the change in daily maximum temperature could increase between 1.3 C and 3.1 C by the 2050s. Increasing temperatures and an expanding number of hot days are likely to impact livestock and milk production.

The number of summer days with temperatures above 25 C are expected to increase in the southern regions as are the expected days with precipitation above 20 mm; the maximum monthly rainfall with a ten-year return period is also expected to increase.[67] Sustained temperature increases are likely to shift in the optimal growing ranges of current crops towards the north, and at higher elevations. Increased temperatures for some areas may result in expanded growing seasons and a net gain in agriculturally productive land. However, the increase in other stressors may offset these gains. Specifically, the risk that an increase in the frequency of very hot days (>35 C) and potential water resource limitations may reduce yields.[68]

To illustrate, the potato has emerged as Bhutan's primary crop, cultivated by around 34,000 rural households, mainly in the temperate agro-ecological zone, contributing significantly to their livelihoods. The sale of potatoes generated BTN 709.81 million in revenue in 2019, aiding farmers in purchasing staple foods and household necessities. However, climate change impacts are adversely affecting Bhutan's agricultural sector, including the potato crop. Studies predict unsuitability for potato cultivation in current areas by the 2050s, particularly in high-elevation zones (>3000 masl) due to rising temperatures.[69]

Climate change impacts on agriculture in Thimphu District

Though there is a lack of published scholarship on the subject, residents living in Thimphu claim that evidence of rising temperatures and their impacts on agriculture are clearly visible. Some experts reported that climate change is making it possible to grow tropical species such as bananas and tomatoes in Thimphu.[70]

Generally, crop production and acreage of land use in the Thimphu district saw a gradual decline in recent years. For instance, paddy, a major cereal grown in the district, has dropped both in terms of acreage and production. From 632 acres producing 1,490 t in 2016, paddy production fell to 1,323 t from 579 acres. Similarly, the area for wheat and barley production reduced from 261 acres and 25 acres to 199 acres and 15 acres respectively. The three crops together recorded a fall from 1,820 t in 2016 to 1,566 t in 2018.[71] The impacts of climate change have started to pose a serious threat to agriculture, biodiversity and livelihood of the Bhutanese people.

Bhutan has witnessed frequent extreme weather events, causing widespread damages to crops and livelihoods. Increasingly under future climate scenarios, Thimphu will also witness greater impacts as both wetland and dryland agriculture is expected to be affected by climate change. Under both irrigated and rainfed systems, rice farming stands out to be highly sensitive to climate change since it requires large quantities of water. Even yield of dryland crops such as maize, wheat, barley, buckwheat and millet are expected to be negatively impacted due to the combined effects of CO_2 fertilization, changing patterns of precipitation and

[66] Li, H., Xu, C.Y., Beldring, S., Tallaksen, L.M. and Jain, S.K. (2016). Water resources under climate change in Himalayan basins. Water Resources management, 30(2), pp. 843–859. URL: http://folk.uio.no/chongyux/papers_SCI/WARM_14.pdf

[67] Royal Government of Bhutan (2021). Third National Communication to the UNFCCC. URL: https://unfccc.int/sites/default/files/resource/TNC%20of%20Bhutan%202020.pdf

[68] The- World Bank Group and the Asian Development Bank. (2021). Climate Ris-k Country Profile: Bhutan. URL: https://www.adb.org/sites/default/files/publication/722636/climate-risk-country-profile-bhutan.pdf

[69] Rai P, Bajgai Y, Rabgyal J, Katwal TB, Delmond AR. Empirical Evidence of the Livelihood Vulnerability to Climate Change Impacts: A Case of Potato-Based Mountain Farming Systems in Bhutan. Sustainability. 2022; 14(4):2339. https://doi.org/10.3390/su14042339

[70] Wangmo, Choki (1st November,2021).Climate change: a local perspective.Kuenselonline.Retrieved in December 2023 from https://kuenselonline.com/climate-change-a-local-perspective/

[71] Namgay, Thinley(April 22,2020).Land remains fallow in most of the gewogs in Thimphu.Kuenselonlne.com. Retrieved in December 2023 from https://kuenselonline.com/land-remains-fallow-in-most-of-the-gewogs-in-thimphu/

heat stress.[72] In the case of apple orchards, wooly aphids, brown rot, collar rots and apple scab diseases have been reported in almost all apple-growing northern districts and impacting the yield.[73]

Impact of Climate Change on Water

Climate change impacts on water in Bhutan

Not only is water one of the most abundant natural resources in Bhutan, it is also the most critical. Water supports the two most important economic sectors – agriculture and hydropower. Water is also critically vulnerable to climate change in Bhutan, as all rivers depend principally on glacier melt, snow, and seasonal rainfall. Springs and small streams are the main water sources for rural parts of the country.

Many rural communities face water scarcity during the dry season when the natural springs they rely on dry up considerably, if not completely. Climate change could alter these water sources. In fact, a study by the Watershed Management Division reported that of the 6,555 water sources in the country, 2,317 (35%) are drying up while 147 have dried up already.[74]

Projections for future river flows due to climate change impact on glacial and river systems show mixed results, but generally models suggest there could be an overall increase in precipitation at the national level. Projected increases in the number of days with very heavy precipitation could further increase the risk of flooding and impact runoff, erosion, and rates of river discharge. The CCKP model ensemble projects a 10%–15% increase in the volume of water falling during a 5-day extreme rainfall episode by the 2050s under RCP 8.5 [75].

Climate change impacts on water in Thimphu District

Thimphu District is characterized by its rich biodiversity and delicate ecosystems. However, deforestation, land degradation, and climate change have led to more frequent and intense forest fires, posing risks to water catchment areas and disrupting the delicate ecological balance. Climate change-induced shifts in precipitation patterns may further exacerbate water scarcity in the district, impacting households, agriculture and ecosystems.

According to a 2021 report from the Watershed Management Division, Department of Forests and Park Services, approximately 37% of the 145 water sources in Thimphu Dzongkhag are experiencing drying conditions. The majority of these affected water sources are located in Kawang and Mewang *gewogs.*[76] Out of the total, 54 water sources are currently in a drying state, while the remaining ones have not experienced any changes in their discharge levels and are in a normal state. Notably, all water sources in Mewang and Genekha *gewogs* are currently in a drying condition.

[72] Chhogyel, N., Kumar, L. Climate change and potential impacts on agriculture in Bhutan: a discussion of pertinent issues. *Agric & Food Secur* 7, 79 (2018). https://doi.org/10.1186/s40066-018-0229-6

[73] Dorji P. Deciduous fruit production in Bhutan. Deciduous fruit production in Asia and the Pacifc; 1999. p 18

[74] WMD (2021). Assessment and Mapping of Water Sources in Bhutan (A comprehensive inventory and status of water sources used by Bhutanese communities). Watershed Management Division, Department of Forests and Park Services.

[75] WBG Climate Change Knowledge Portal (CCKP, 2021). Climate Data: Projections. URL: https://climateknowledgeportal.worldbank.org/country/bhutan/climate-data-projection

[76] WMD (2021). Assessment and Mapping of Water Sources in Bhutan (A comprehensive inventory and status of water sources used by Bhutanese communities). Watershed Management Division, Department of Forests and Park Services.

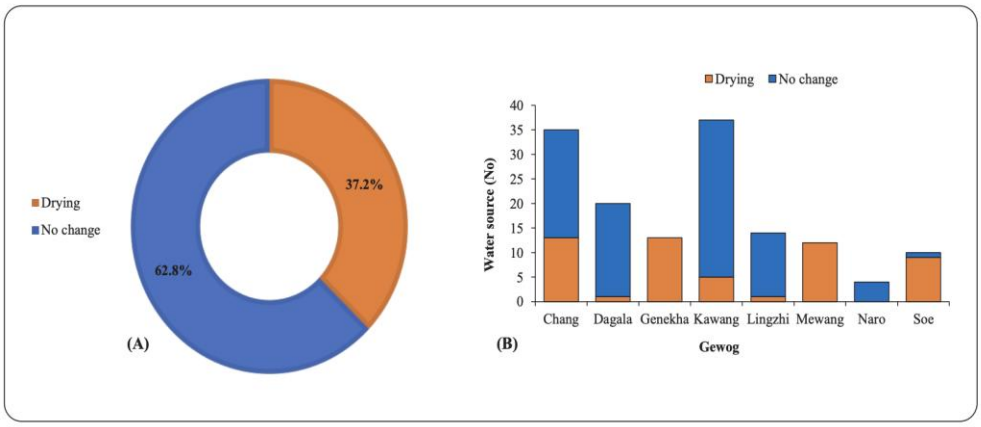


Figure 10. Status of Water Source in Thimphu Dzongkhag (A: Dzongkhag Level; B: Gewogs)[77]

In addition, the assessment report of 2020 on selected watersheds of Thimphu Dzongkhag reported that watersheds of Pulluna, Chudingkha, Siluna, Jamephu, Tsaphu, Wooluna, Sisilum, Churalum, Khariphu, Geney Rongchu, Dorji Nye, Hongola fall under the 'Degraded Category.'[78]

Table 2. Degraded Watersheds in Thimphu District.[79]

WS ID No.	Name of sub-watershed	Uses	Beneficiaries	Gewog	Overall risk score
73	Pulluna	Drinking and dryland irrigation	Pulluna, Monasteries, RNR Center, Chicken Farm	Mewang	Degraded
73	Chudingkha		Jimina industrial estate		
73	Siluna		Siluna, Lingzhephaka, Jimina school		
74	Jamephu	Drinking and irrigation	Ramtokto, Nyzerkha, Danglu, Simu, Dramsa,Chhudingkha, Namseling		
74	Tsaphu		Khasadrapchu town and school, RNR Center, Singye		
74	Wooluna		Wooluna, Danglo		
85	Sisilum		Sisina, Dalukha, Khasakha, Community school, Rehab center		
85	Churalum		Patsikha, Kinzang Dechenling, Drupdey, Sisi nun center, Old-age home		
85	Khariphu		Khariphu and adjoining industries		
89	Geney rongchhu		Wang Barma Central School, Cheju Goempa, Goesarbu Lhakhang, Laktsham, Chuzon Gate, BPC colony	Geney and Dagala	
89	Dorji Nye	Drinking and dryland irrigation	Genekha Gewog Center, Genekha School	Geney	
89	Hogola	Dryland irrigation	Tshocheykha, Zamto and adjoining villages in mewing gewog	Geney and Dagala	

Impact of Climate Change on Poverty

The projected climate change impacts shall affect the poorest groups disproportionately since poverty is most prevalent in rural districts, where the population rely on agriculture for livelihood. The adaptive capacities of the rural poor are minimal, especially in terms of investing in climate-resilient agricultural technology and methods. Poorer farmers may not afford local water storage, irrigation infrastructure, and technologies for adaptation.

While the Bhutanese government has been successful in reducing poverty over the last two decades, the agriculture sector's vulnerability to climate change vastly increases the risk of the rural populations of Bhutan falling back into poverty.

[77] *Ibid*
[78] *Ibid*
[79] *Ibid*

A study in the Punakha District found 91% of the households surveyed were affected by monsoon pattern changes, impacting water availability for irrigated rice farming.[80] Recently, in October 2021, incessant rainfall affected paddy harvests in several districts across the country, damaging an estimated 1,945 t of rice production in Paro District alone.[81,82]

Climate change impacts on Poverty in Thimphu District

According to the latest report by the National Statistical Bureau, the poverty rate for Bhutan is 12.4%. Poverty however is not evenly distributed across areas; while the rural poverty rate is 17.5%, it drops to 4.2% in urban areas.[83] Although, poverty rate in Thimphu (1.2%) is one of the lowest among the districts, climate change is expected to further exacerbate the food security in general for the vulnerable farming communities.[84]

Climate Change and Gender

Although women in Bhutan enjoy significant rights, the status of gender equality presents a complex scenario. Substantial efforts have been taken to enhance the well-being of women and girls, shown by achievements such as gender parity in education up to the secondary level, a decline in maternal mortality, and an increase of women's involvement in societal and professional areas.

Simultaneously, Bhutan has committed to numerous international gender conventions and agreements, and equal rights are explicitly outlined in the country's Constitution and other legal frameworks. However, persistent gender inequalities exist, notably in areas like unequal land ownership and the limited representation of women in certain sectors[85].

Gender differences are visible in Climate change vulnerability, participation in CC decision-making action, and diverse levels of benefit-sharing. In 2017, almost 60% of employed women were active in agriculture, as compared to 34% of the employed men.[86] The feminization of agriculture because of out-migration of males bears notable significance in the impact of climate change on agriculture, and thus women. Women also experience a higher unemployment rate, gender payment gaps, and gender-based violence.[87] In rural households, gender-specific tasks include livelihood tasks such as collection of drinking water by females and irrigation water by males; household tasks which are mainly carried out by females; non-farm work/off-farm employment especially of males; and decision-making and attending meetings mainly by males.

[80] Warner, K. and Van der Geest, K. (2013). Loss and damage from climate change: local-level evidence from nine vulnerable countries. International Journal of Glbal Warming, 5(4), pp. 367–386. URL: https://www.researchgate.net/publication/258120139_Loss_and_damage_from_climate_change_Local-level_evidence_from_nine_vulnerable_countries

[81] Phuba Lhamo et al. (2021). Incessant rain damages paddy crops across the country. Kuensel. URL: https://kuenselonline.com/incessant-rain-damages-paddy-crops-across-the-country/

[82] Phub Dem. (2021). Rains damage about 1,945MT of rice in Paro. Kuensel. URL: https://kuenselonline.com/rains-damage-about-1945mt-of-rice-in-paro/

[83] National Statistics Bureau of Bhutan (2022). Bhutan Poverty Analysis Report. National Statistics Bureau of Bhutan. Royal Government of Bhutan.

[84] Chhogyel, N., Kumar, L. Climate change and potential impacts on agriculture in Bhutan: a discussion of pertinent issues. *Agric & Food Secur*7,79 (2018). https://doi.org/10.1186/s40066-018-0229-6

[85] National Commission for Women and Children (2020). Gender and Climate Change. URL: https://www.ncwc.gov.bt/publications/Gender_and_Climate_Change_Bhutan1583629500.pdf

[86] National Statistical Bureau (2017). Population and Housing Census Bhutan (PHCB) (2017). National Statistics Bureau. Royal Government of Bhutan.

[87] National Commission for Women and Children (2020). Gender and Climate Change. URL: https://www.ncwc.gov.bt/publications/Gender_and_Climate_Change_Bhutan1583629500.pdf

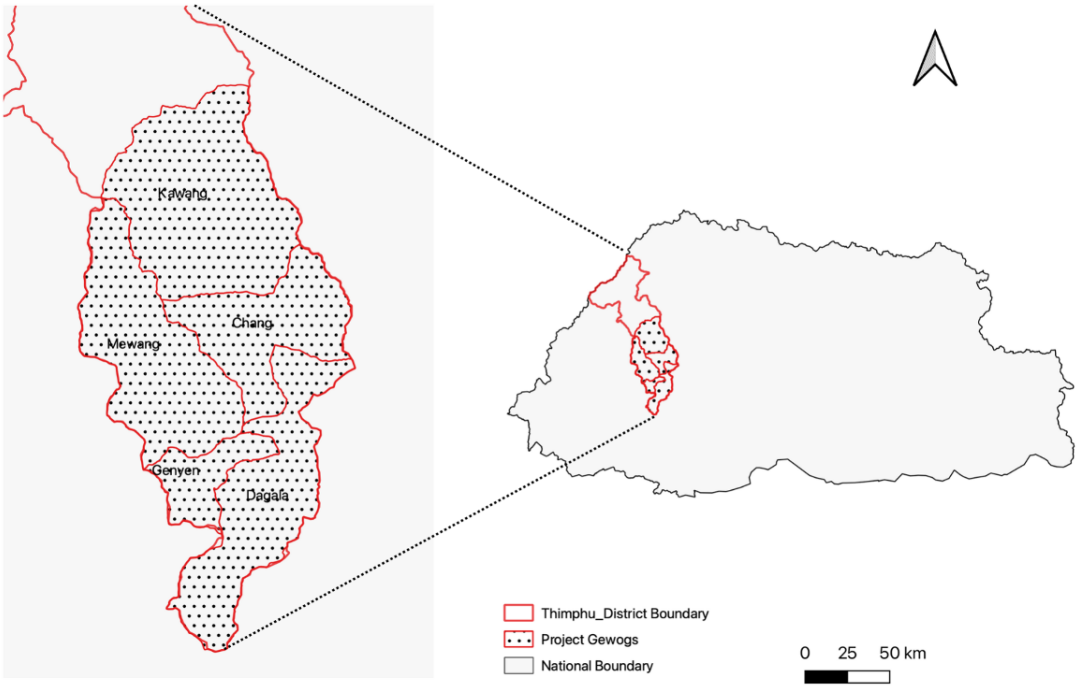
While climate change issues have been integrated in the 'National Gender Equality Policy' and the 'National Plan of Action for Gender Equality' (2019-2023), application of the various tools to mainstream gender into climate change actions are limited due to limited resources and capacity gaps.[88]
Adaptation measures related to farming practices, forest management, and protected areas require women's active and informed participation, to be effective. However, women's active participation and gender balance in climate policy development and decision-making overall is significantly lower than that of men. A study on gender and climate change showed that there is an urgent need to empower female farmers and enhance their communication skills to improve women's decision-making abilities in (local) governance and farming decisions, including those related to climate smart agriculture and climate resilient agriculture.[89]

Project Sites:

The proposed project, **"Securing Water & Enhancing Climate Resilience in Thimphu District, Bhutan,"** aims to address several interrelated challenges faced by communities in Thimphu District, Bhutan. The Thimphu Dzongkhag's economic, social, and environmental context poses significant risks to water security and overall climate resilience, impacting the livelihoods and well-being of communities in Thimphu Dzongkhag.

In the context as put forth above, the proposed project aims to restore catchments, reduce the risks of forest fires, and enhance drinking water and irrigation systems in Thimphu district. By implementing sustainable water management practices and promoting community engagement, the project seeks to secure water resources, improve climate resilience, and enhance the socio-economic well-being of vulnerable communities in Thimphu.

The project will focus on (Kawang, Mewang, Chang, Dagala and Genyen gewogs benefiting a total of 666 households from the five *gewogs* and at least 52% women population. Figure 11 below, illustrates the location of the project sites.



88 *Ibid*
89 *Ibid*

Figure 11. Location of project sites (Kawang, Mewang, Chang,Dagala and Genyen gewogs) within Thimphu District (Data Source: National Land Commission Secretariat, 2026).

Through collaboration with local stakeholders and the adoption of holistic approaches, the project aspires to align with Bhutan's GNH principles, ensuring a balanced and sustainable development trajectory for the region.

The following outcomes are expected through the proposed activities:

1. Increased ecosystem resilience in vulnerable communities
2. Increased agricultural productivity and income for the farmers especially women.
3. Improved health and well-being of communities and their families through access to clean reliable drinking water.
4. Enhanced community resilience to climate change impacts

Project / Programme Objectives:

List the main objectives of the project/programme.

The overall objective of the project is to enhance the adaptive capacities of communities to impacts of climate change by building resilience and implementation of ecosystem-based adaptation measures in Thimphu district.

The specific objectives are to:

1. Increase ecosystem resilience in response to climate change and variability-induced stress: Implement ecosystem-based adaptation interventions to ensure natural capacity for water infiltration, recharge and water buffering through restoration, rehabilitation, and protection of degraded catchment areas/ watersheds, thereby improving water retention, groundwater recharge, and overall water availability.

2. Enhance Sustainable Water Resource Management: Improve access to clean and safe drinking water and resilient irrigation systems through the development of community-based water supplies, strengthen Water User Associations (WUAs) with 30% women participation and promote sustainable water resource management.

3. Strengthen the adaptive capacities of local communities and organizations: Enhance the capacities of local communities and organizations in the planning, governance and implementation of water adaptive mechanisms to reduce vulnerability against climate change with special consideration to women (at least 30% women participation in all capacity building activities).

Project / Programme Components and Financing[90]:

Fill in the table presenting the relationships among project components, activities, expected concrete outputs, and the corresponding budgets. If necessary, please refer to the attached instructions for a detailed description of each termFor the case of a programme, individual components are likely to refer to specific sub- sets of stakeholders, regions and/or sectors that can be addressed through a set of well-defined interventions / projects.

Table 3 Project Components and Financing

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Amount (US$)

[90] IE and EE fees calculator: https://www.adaptation-fund.org/document/ie-and-ee-fees-calculator/

1. Ecosystem-based adaptation (EbA) to ensure natural capacity for water infiltration, recharge and water buffering.	**Output 1.1** Water Resource Management & Governance strengthened **Output 1.2** Ecosystem-based Adaptation (EbA) solutions and Sustainable Land Management (SLM) interventions implemented to enhance watershed functions and reduce flood and erosion risks. **Output 1.3.** Integrated forest fire management systems established to reduce climate-induced forest fire risks.	**Outcome 1**: Increased ecosystem resilience in response to climate change and climate variability-induced stress.	**838,900.00**
2. Community-based climate resilient drinking water and irrigation infrastructure established	**Output 2.1** Community-based climate resilient drinking water infrastructure established **Output 2.2** Community-based climate resilient irrigation infrastructure established & improved	**Outcome 2**. Ensured access to irrigation and safe and reliable drinking water.	**3,044,504.00**
3. Capacity of local communities and organizations on knowledge and skills related to sustainable water resource management, local climate adaptation planning and implementation enhanced.	**Output 3.1** User groups in the community strengthened for effective management of irrigation and drinking water **Output 3.2** Capacity of local communities, local leaders and organizations enhanced on local adaptation planning and implementation. **Output 3.3** Dissemination of Project Results and Lessons Learned	**Outcome 3**. Increased resilience of local communities to climate change through enhanced capacity in adaptation planning and implementation	**322,416.00**
4. Project/Programme Execution cost (9.5%)			**374,200.00**
5. Total Project/Programme Cost			**4,205,820**
6. Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable) (8.5%)			**354,230.00**
7. ESMP and GAP			**65,750**
Amount of Financing Requested			**5,000,000**

Projected Calendar: *Indicate the dates of the following milestones for the proposed project/programme*

Table 4 Projected Calendar

Milestones	Expected Dates
Start of Project/Programme Implementation	January 2027
Mid-term Review (if planned)	July 2028
Project/Programme Closing	June 2029
Terminal Evaluation	October 2030

PART II: PROJECT / PROGRAMME JUSTIFICATION

A. Describe the project / programme components, particularly focusing on the concrete adaptation activities of the project, and how these activities contribute to climate resilience. For the case of a programme, show how the combination of individual projects will contribute to the overall increase in resilience. Specify how the project/programme enables devolving decision making to the lowest appropriate level and gives local institutions and communities more direct access to finance and decision-making power over how adaptation actions are defined, prioritized, designed, implemented; how progress is monitored and how success is evaluated.

The project for securing water and enhancing climate resilience in Thimphu District is expected to cultivate more vibrant ecosystems and enhance the quality of associated services. At the heart of this initiative lies a systematic approach to addressing issues tied to water availability and utilization throughout the entire watershed. Moreover, the project takes a holistic view of sustainability, considering technical, financial, and institutional considerations, thereby enhancing its potential for enduring success. Significantly, the active participation of beneficiaries serves as a linchpin, ensuring the project's effectiveness and fostering resonance within the local community. Furthermore, integrated forest fire management adds another layer of proactive environmental stewardship to the project's multifaceted goals, safeguarding against potential threats and further promoting ecological balance.

Component 1: Ecosystem-based adaptation (EbA) to ensure natural capacity for water infiltration, recharge and water buffering implemented.

This component aims to strengthen the natural capacity of watersheds to capture, store, and regulate water through the implementation of ecosystem-based adaptation (EbA) measures and improved water resources governance. It combines policy reform, integrated river basin planning, knowledge generation, hydrological and hydrogeological assessments, and community-led watershed restoration to address increasing climate-related water insecurity in the Wangchhu River Basin and targeted communities of Thimphu Dzongkhag. Through the adoption of Integrated Water Resources Management (IWRM) principles, strengthening of water governance institutions, mapping of critical recharge areas, and implementation of ecosystem-based solutions such as spring revival, watershed restoration, riparian rehabilitation, and habitat enrichment, the component will enhance groundwater recharge, improve water buffering functions, and secure sustainable water supplies. By integrating scientific evidence with local knowledge and participatory planning, the component will increase the resilience of ecosystems and communities to climate variability while promoting long-term water security, biodiversity conservation, and sustainable livelihoods.

Under this component, the proposed project intends to achieve the following outputs:

Output 1.1 Water Resource Management & Governance strengthened

This output aims to strengthen water resources management and governance systems to enhance the efficiency, equity, sustainability, and climate resilience of water resources in the Wangchhu River Basin and targeted communities in Thimphu Dzongkhag. The output will support the creation of an enabling policy, institutional, and knowledge environment that allows water resources to be managed in an integrated and adaptive manner in the face of growing climate variability and increasing water demand.

A key focus of this output is the strengthening of the national and basin-level governance framework for water resources management. This will be achieved through the review and updating of the Water Policy and Vision 2008, promotion of Integrated Water Resources Management (IWRM) principles, development of the Wangchhu River Basin Management Plan, establishment of a Water Security Index System, and formation of the Wangchhu River Basin Committee. These interventions will improve inter-sectoral coordination, support

transparent and evidence-based decision-making, and facilitate equitable allocation and sustainable use of water resources among different users. Particular attention will be given to ensuring that local communities, women, and vulnerable groups are represented in planning and decision-making processes.
The output will also strengthen the scientific and knowledge foundation for climate-resilient water resources management. A national water knowledge bank will be established to consolidate hydrological, climatic, ecological, and socio-economic information relevant to water planning and management. Partnerships with academic institutions, particularly the College of Science and Technology, will be enhanced to strengthen water-related curricula and build the next generation of water professionals. Furthermore, assessments of ongoing water adaptation initiatives will be undertaken to identify lessons learned, knowledge gaps, and future intervention priorities, with findings disseminated through technical publications and policy briefs.
Recognizing the need for improved evidence to support climate adaptation planning, hydro-meteorological and hydrogeological assessments will be conducted within the targeted watersheds. While existing meteorological monitoring stations provide limited localized information, the project will generate detailed watershed-level hydrological and hydrogeological data to better understand changes in water availability, recharge dynamics, and climate-induced risks. Local communities, Gewog administrations, and relevant government agencies will actively participate in data collection, monitoring, and interpretation, thereby strengthening local ownership and technical capacity.
The information generated through hydrological mapping and watershed assessments will guide the identification of critical recharge zones and degradation hotspots. Based on these findings, appropriate Ecosystem-based Adaptation (EbA) measures will be designed and implemented to restore watershed functions, enhance groundwater recharge, reduce erosion, improve vegetation cover, and secure sustainable water supply. These nature-based solutions will be developed through participatory planning processes to ensure that interventions are locally relevant, socially inclusive, and environmentally sustainable.
By integrating policy reform, river basin governance, knowledge generation, hydrological assessments, and ecosystem restoration, this output will establish a robust foundation for climate-resilient water resources management. The resulting improvements in institutional capacity, information systems, watershed health, and stakeholder collaboration will contribute to long-term water security, strengthen adaptive capacity to climate change, and support sustainable livelihoods in the targeted communities.

Specific activities of this output are:

1.1.1 Update Water Policy and Vision 2008
1.1.2 Promote adoption of Integrated Water Resources Management (IWRM) principles
1.1.3 Institute a knowledge bank on water resources management
1.1.4 Conduct hydrological and hydrogeological assessments in watersheds and implement Ecosystem-based Adaptation (EbA) solutions for watershed conservation and sustainable water supply

Output 1.2 EbA solutions & SLM to enhance watershed functions; minimize impact of floods and extreme rainfall implemented
This output focuses on the implementation of EbA solutions and sustainable land management (SLM) interventions to enhance watershed functions. EbA interventions are proven to enhance biodiversity and contribute to the overall health of ecosystems besides reducing vulnerability to climate related disasters, enhancing community and ecosystem resilience.
The overall goal is to minimize the impact of floods and extreme rainfall events, mitigating the risks associated with water-related disasters and promoting ecological resilience. As such, effective EbA interventions will be implemented through local community participation, such as reforestation, green infrastructure, and soil conservation measures. Sustainable land management practices can effectively reduce the risk of flooding and improve soil and water conservation. Under this output, the identified degraded watersheds within Thimphu district will be restored through implementation of feasible EbA interventions and adoption of sustainable land management practices. During the full proposal development stage, detailed community consultations will be held with the target communities and community needs will be validated based on local knowledge. All priority

adaptation actions including new ones identified will be incorporated into the larger EbA strategy in the full proposal.

The Gewog Planning Cycle has a strong M&E requirement, which allows community members to provide feedback for any development activities undertaken in the community. If a member/community wants to provide feedback, then they can submit such feedback to the Gewog Administration in writing. At the Gewog, a Monitoring team is already constituted to assess and validate feedback received. If any issues arising out of such feedback cannot be resolved at the Gewog, then the case is escalated to the Dzongkhag Administration. At the Dzongkhag level too, a Dzongkhag committee is in place to resolve such issues. Community members can also provide feedback through local Community WhatsApp/Wechat groups on urgent issues requiring immediate corrective action.

Specific activities of this output are:
1.2.1: Implementation of the EbA solutions through community participation and engagement
1.2.2: Develop a guide for Drought Preparedness and Response Plan
1.2.3: Promotion of Climate-smart and Sustainable Agriculture Practices

Output 1.3 Mitigation of forest fire hazards by promoting integrated forest fire management.
In recent years, Thimphu district has experienced a surge in the occurrence of forest fires, which have caused substantial depletion of forest resources, compromised water sources, and posed danger to human lives and property. To manage the adverse impacts from the increasing hazards, a range of fire management interventions will be implemented under this project.

Specific activities of this output are:
1.3.1: Establishment of Gewog level forest fire coordinating group (GFCGG) in Thimphu district to foster community participation in forest fire management.
1.3.2: Development of Ecosystem based adaptation solution for forest fire suppression.

Component 2: Community-based climate resilient drinking water and irrigation infrastructure established

Component 2 focuses on improving access to clean, safe, and reliable drinking water for households and ensuring the sustainable supply of irrigation water for farming communities in four gewogs of Thimphu Dzongkhag.
As the most populous district in Bhutan, Thimphu faces growing pressure on its natural resources, particularly water. Recent assessments have reported declining water yields and drying water sources in Kawang, Dagala, Chang, Mewang, and Genyen Gewogs, exacerbating existing challenges related to inadequate drinking water supply. These challenges are further intensified by rapid urbanization, population growth, and increasing climate variability, with significant implications for public health, agricultural production, and overall community well-being.
The project will strengthen the climate resilience of both drinking water and irrigation infrastructure, thereby reducing vulnerability to climate change-induced extreme events and minimizing recurring expenditures on infrastructure repair and recovery. Improved irrigation systems are expected to enhance agricultural productivity, increase household incomes, and support sustainable rural livelihoods. By providing a more reliable and flexible water supply, climate-resilient irrigation schemes will enable farmers to diversify into higher-value crops and adopt more productive farming practices.
The project will also introduce efficient water conveyance technologies, including hydro-pressure pipe systems, which will significantly reduce water losses resulting from seepage, uncontrolled spillages, and

evapotranspiration. Improved water-use efficiency and year-round water availability will lessen the economic burden on households that currently rely on costly alternative water sources during periods of scarcity. Collectively, these interventions will enhance water security, reduce vulnerability to drying water sources, and strengthen the adaptive capacity of communities to climate-related risks.

Furthermore, increased agricultural productivity and diversification, together with livelihood opportunities arising from ecosystem-based adaptation measures, are expected to generate additional income streams for rural households. These benefits will contribute to poverty reduction, improved food security, and greater socio-economic resilience among vulnerable communities.

Through a series of comprehensive consultation meetings involving local communities, Gewog administrations, Dzongkhag planners and engineers, elected local leaders, and other key stakeholders, the project team validated community priorities and assessed local needs. Based on these consultations, stakeholders collectively prioritized five drinking water supply schemes and four irrigation schemes for implementation. The technical specifications, engineering designs, and implementation requirements for these schemes were subsequently finalized through a participatory planning process involving Dzongkhag technical personnel, Gewog representatives, and beneficiary communities, ensuring that the proposed interventions are technically sound, locally relevant, and responsive to the needs of the target populations.

Output 2.1 Enhanced access to clean and safe drinking water
This output focuses on strengthening the efforts to ensure access to reliable supply of clean and safe drinking water in identified communities in Thimphu.

Specific activities of this output are:
2.1.1 Construction of Woluna Water Supply Scheme, Maedwang Gewog
This activity aims to integrate irrigation and drinking water supply systems in the Waluna under Maedwang Gewog. Households in Waluna are grappling with issues related to water availability for drinking and irrigation. The existing water supply system is quite old, not able to meet the increasing demands due to peri-urban expansion, in Waluna, which further pressurizes the water resource crunch in the area. Therefore, this activity will help to optimize water resources and provide a sustainable and efficient solution to meet the dual needs of agriculture and potable water for communities in Waluna. The activity will benefit a total of 110 households and a total population of 560 individuals (includes 285 females) and a total of 46 acres of agricultural land (~11 acres of dryland; 27 acres wetland).

2.1.2 Construction of Changtagang Water Supply Scheme, Kawang Gewog
The construction of the Changtagang Water Supply is aimed towards addressing the drinking water needs of the Changtanag community. This activity will ensure a consistent and secure source of clean water for daily consumption and other domestic purposes to meet the rising demand due to peri-urban expansion. This will benefit a total of 83 households of Changtagang with 413 individuals (including 180 females).

2.1.3 Construction of Chamgang Water Supply Scheme,Dagala Gewog
This activity is targeted to enhance the access to safe, clean and reliable drinking water supply to the communities of Chamgang. Due to increasing number of households because of peri-urban expansion the demand for drinking water has increased recently. People also reported acute water shortages in these areas. This activity will benefit 167 households, and 2094 individuals, including 707 females.

2.1.4 Construction of Khasadrapchu Water Supply Scheme, Maedwang Gewog
This water supply scheme will enhance the access to safe, clean and reliable drinking water supply to the households of Khasadrapchu. This scheme will benefit 684 households and 4000 individuals, (3000 females and 1000 males).

2.1.5 Construction of Rama Water Supply Scheme, Chang Gewog

This activity is targeted to ensure improved access to safe drinking water for households in Rama. Due to increasing number of households due to peri-urban expansion, increasing commercial establishments in Rama, and shrinking water source, there is acute shortage of drinking water supply in Rama. This will benefit 159 households and a total of 927 individuals, including 417 females.

Output 2.2: Enhanced access to adequate irrigation water

Promotion of sustainable agriculture and food security is at the core of Output 2.2. This output focuses on enhancing access to adequate and reliable irrigation water for enhancing agriculture in vulnerable communities of Thimphu district.

Specific activities of this output are:

2.2.1 Rehabilitation of Lower Woluna/Danglo Irrigation Channel, Maedwang Gewog

The Lower Woluna/Danglo Irrigation structure was established quite some time ago and is now due for maintenance to ensure its continued contribution to agriculture sustainability.

The rehabilitation of the Danglo irrigation scheme will benefit a total of 7 households with 44 individuals (25 females); a total of 2 acres of wetland and 5 acres dryland.

2.2.1 Rehabilitation of Dalukha to Khasakha Irrigation Channel, Maedwang Gewog

The construction of Khasakha Irrigation infrastructure will enhance agricultural productivity by providing a reliable water supply for irrigation for farming households of Khasakha, under Maedwang Gewog. The Khasakha Irrigation scheme will benefit 81 households, with 504 individuals (300 females), and a total of 206 acres of agricultural land (~316 acres dryland and ~138 acres wetland).

2.2.2 Rehabilitation of Dalukha to Dalulum Irrigation Channel, Maedwang Gewog

The construction of Dalukha to Dalulum Irrigation scheme, will enhance irrigation water for 49 households of Dalukha with 170 individuals (102 females); a total of ~220 acres of agricultural land (~170 acres dryland; 50 acres wetland).

2.2.4 Construction of Gangritueshay to Zangleykha Irrigation Scheme, Genyen Gewog

The construction of the Zangleykha Irrigation scheme will enhance irrigation water for 87 households of Zangleykha, and Genyen chiwogs with benefiting 538 individuals (378 females); a total of ~ 177 acres of dry land.

Component 3: Capacity of local communities and organizations on knowledge and skills related to sustainable water resource management, local climate adaptation planning and implementation enhanced.

Capacity building of the local communities and relevant stakeholders empower them to actively participate in the effective water resource management, also, it fosters a sense of ownership and responsibility leading to adoption of the best practices. Bhutan is vulnerable to various climate change impacts; capacity building helps communities to adapt to the changes by providing them with the right skill and tools to cope with water related issues. The capacity building also helps the water users collect and maintain right information on water usage, progress and impacts of adaptation interventions, and making informed decisions for future planning.

This can be achieved through the following outputs and activities:

Output 3.1 Community based Water User Associations (WUAs) strengthened for effective management of irrigation and drinking water.

This output focuses on formalizing and strengthening capacities of Water User Associations (WUAs) in targeted communities to enhance sustainable effective management of irrigation and drinking water resources. By fostering collaboration and shared responsibility, the project aims to create resilient and self-sufficient user groups capable of ensuring the sustainable use of water resources. Specific trainings-workshops, and community engagement initiatives, will be organized to empower these user groups with the knowledge and skills necessary for efficient water management.

In the designated communities, Water User Associations (WUAs) have been established in each target community, after consultation with local residents. These WUAs operate under Bylaws that have received approval from the relevant Gewog Administration. Each WUA is governed by a committee consisting of a Chairman, Treasurer, and Water Caretaker/Guard, all of whom are elected by the association members. The WUAs possess the authority to make decisions regarding the distribution of water resources and oversee the daily management of water supply and irrigation systems. The Department of Water has created guidelines for the WUAs, and in cases where new associations are formed, their bylaws will be aligned with these guidelines. For existing WUAs, a review of the bylaws will be conducted to ensure they comply with the updated guidelines.

The Water User Associations (WUAs) established under this initiative will adhere to the Guidelines for WUA Establishment set forth by the Department of Water. Each WUA will undergo registration with the Department of Water following approval from the Gewog and Dzongkhag. This new registration at the Central Department Level will strengthen the legal standing and authority of these associations to manage and allocate water resources locally. This formalization will elevate the WUAs to recognized legal entities, granting them the necessary powers and authority to manage water resources efficiently in compliance with the Bhutan Water Act, along with its associated rules and regulations.

Beyond just capacity building workshops, the concept of co-creation was implemented during the project formulation phase as well as during the implementation phase too, ensuring that community members are involved from the outset and have an equal voice in identifying and designing interventions. All consultations and training workshops will promote participation from every segment of the community including gender representation. For community consultations and training sessions, representatives from all households, including those from vulnerable and marginalized groups, will be included with the support of the local government administration. All households will automatically be considered members of the Water User Associations (WUAs), which will be formally registered as recognized entities. Capacity building efforts aimed at WUAs will guarantee the involvement of representatives from all households, including those that are vulnerable and marginalized.

Additionally, specialized training sessions are scheduled for the office bearers of the Water User Associations (WUAs) to enhance their skills in the operation and maintenance of water supply and irrigation systems.

Specific activities of this output are:
3.1.1 Community engagement and WUA establishment or strengthening
3.1.2 Conduct training workshops on project management, financial management and monitoring and evaluation skills for community-based water user groups
3.1.3 Specific training on operation and maintenance of water supply and irrigation systems for the WUA members

Output 3.2 Capacity of local communities, local leaders and organizations enhanced on local adaptation planning and implementation.
This output is focused on building the capacity of local communities, leaders, and organizations for local adaptation planning and implementation. Through the project targeted communities will be equipped with the tools and expertise needed to adapt to changing climatic conditions. Training programs, knowledge-sharing platforms, and hands-on workshops on adaptation planning and implementation will be organized for local leaders and key stakeholders. The capacity of Local leaders and key stakeholders will be enhanced to identify, plan, and implement effective strategies for climate adaptation at the community level.

Targeted training in leadership and project management aimed at facilitating local adaptation planning and implementation. This initiative will identify and designate women leaders and youth from the selected communities to participate in these specialized training programs, fostering the development of future community leaders. Targeted training on Integrated Water Resource Management is planned for the communities, along with a session focused on Sustainable Agriculture practices.

Specific activities of this output are:
3.2.1Capacity building on climate change adaptation, planning and implementation for local leaders and communities
3.2.2 Conduct training workshops on project management; financial management; advocacy and communication skills for local leaders to strengthen the organizational and leadership skills
3.2.3 Capacity building for Gewog engineers and technicians
3.2.4 Capacity building training workshop for communities on integrated water resource management and sustainable agricultural practices.
3.2.5 Capacity building training workshop on disaster risk management including forest fires, flash floods, landslides, etc.

Output 3.3 Project Results and Lessons Learned disseminated effectively.
As part of the knowledge-sharing and capacity-building strategy, this output focuses on the effective dissemination of project results and lessons learned. Valuable insights, successful strategies, and best practices from the project implementation will be disseminated through various communication channels such as workshops, seminars, reports, and community events. The effective dissemination and sharing of the achievements of the project is aimed to facilitate cross-community learning and inspire replication of successful approaches in other districts. Output 3.3 not only ensures that the project's impact extends beyond the immediate community but also contributes to a broader understanding of effective water management and local adaptation strategies.

Informal platforms on WhatsApp, WeChat, and other social media channels already exist to facilitate cross-community learning among community members and local government officials within and beyond the relevant Gewog. Additionally, groups for the Dzongkhag Development Committees are in place, allowing the local leaders to share success stories. To formalize the learning process, annual workshops will be organized to disseminate project results. These workshops will present findings and experiences from targeted project areas to a broader audience, including community leaders, policymakers, and government officials.

Three project results dissemination workshops are planned under component 3. During these workshops, participants will be taken for field visits to similar successful project sites for cross-learning, including sites within the AF Water Project currently being implemented by Bhutan.

Specific activities of this output are:
3.3.1 *Organize community forums and workshops to share experiences and lessons learned*
3.3.2 Knowledge products developed, disseminated and utilized via knowledge sharing platform

3.3.3 Regular Monitoring and Evaluation of project results

The project places a strong emphasis on building the capacity of local institutions, such as local governments at the Gewog (block) level and community representatives of the Water User Associations in the target project sites within Thimphu. The project design is based on participatory approaches, with adaptation activities prioritized from the community level and included in District Level Plans. Community Leaders and existing groups, particularly Water User Association members, will receive training in adaptation planning and implementation. Specific training in financial management and monitoring and evaluation is also proposed, enabling communities to make better decisions regarding adaptation planning and implementation.
The project will establish local adaptation committees and implement community-based monitoring systems to engage local stakeholders in progress tracking and reporting for adaptation actions. It will also strengthen community feedback mechanisms for assessing the effectiveness of adaptation measures and making necessary adjustments. The project aims to strengthen participatory governance to empower local-level decision-making and recognizes the importance of integrating local indigenous knowledge into adaptation strategies, ensuring that traditional practices and insights are valued and utilized in the design and implementation of adaptation actions.

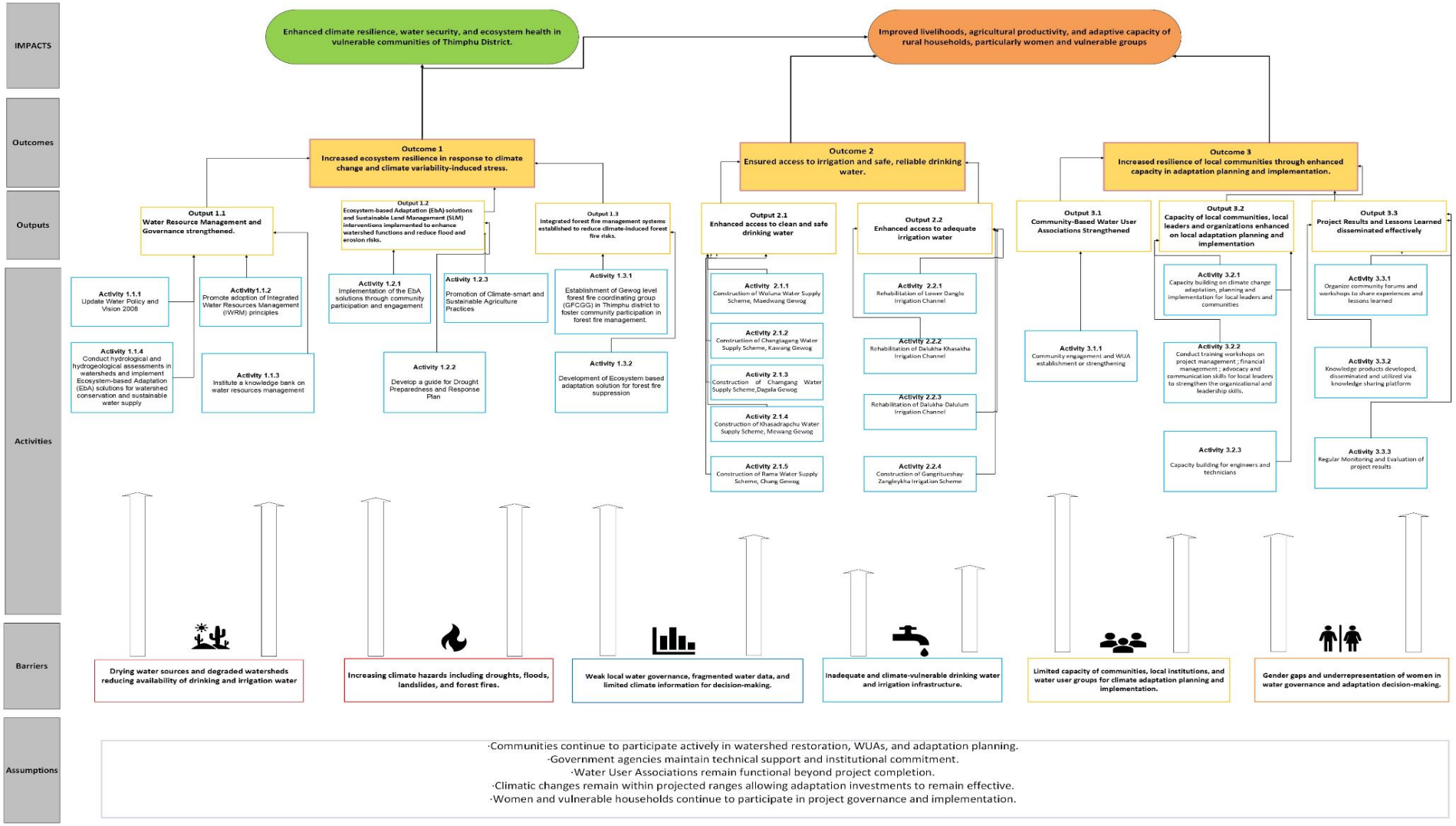


Figure 12 Project Theory of Change

B. Describe how the project / programme provides economic, social and environmental benefits, with particular reference to the most vulnerable communities, and vulnerable groups within communities, including gender considerations. Describe how the project / programme will avoid or mitigate negative impacts, in compliance with the Environmental and Social Policy and Gender Policy of the Adaptation Fund. In particular, specify how the project/programme is addressing structural inequalities faced by women, youth, children, people with disabilities, people who are displaced, Indigenous Peoples and marginalized ethnic groups.

The anticipated effects of climate change will place additional pressure on ecosystem-based livelihoods and further challenge vulnerable groups. Thus, the project's primary focus will be on local-level adaptation, aiming to enhance benefits for exposed or sensitive communities and fostering positive changes at various levels.

Environmental Benefits

- The project is developed on the basic understanding that resilient and healthy ecosystems are fundamental to sustaining natural and human systems.
- The eco-restoration of degraded watersheds and catchments will enhance habitat quality and biodiversity by safeguarding watersheds. This will help reduce instances of water sources drying up during extreme climate events like droughts.
- The strengthening of community-based water management groups/WUAs will foster collaboration between upstream and downstream communities, leading to stronger ownership and stewardship of the natural environment.
- Formalizing Water User Associations (WUAs) will improve efficient utilization and management of water resources, enabling systematic monitoring and better decision-making for effective recharge of catchment areas.
- Improved irrigation systems will minimize negative environmental impacts, such as landslides resulting from poorly maintained open irrigation canals.
- The introduction of technologies like hydro-pressure pipes will reduce water losses from uncontrolled spillages and evapotranspiration.
- Sustainable Land Management (SLM) / Ecosystem based solutions will combat topsoil erosion and land degradation, enhancing soil fertility and biodiversity.
- Improved adaptation planning at the local government level will empower communities to build climate resilience through better management of natural resources.
- Local government involvement will strengthen institutional channels for comprehensive water management from source to end-users.

Economic benefits

- Catchment protection will enhance the water availability in water stressed communities.
- Continuous water supply will reduce the economic burden on users seeking alternatives during erratic water availability, ultimately reducing vulnerability to risks of drying water sources.
- Increased incomes due to engagement in other economic activities related to ecosystem-based adaptation measures, and higher agricultural productivity, will alleviate poverty in vulnerable rural communities.
- More stable income will enhance the capacity of vulnerable groups to cope with the negative impacts of a warmer climate in their locality.
- Habitat enrichment within managed watersheds will enhance biological diversity and an increase in provisioning ecosystem services, such as a higher availability of NWFPs like mushrooms, and fiddlehead ferns, which are commonly harvested to supplement household income.

- The project will enhance the climate resilience of irrigation infrastructure, reducing the costs associated with climate change-induced extreme events and easing the burden on public resources from continuous recovery expenses.
- Improved irrigation schemes will boost agricultural productivity and income of households.
- Climate-resilient irrigation systems will provide a more flexible and reliable water supply, promoting diversification into higher-value crops.
- Catchment restoration reduces the downstream sediment load, which could otherwise hamper the efficiency of Bhutan's hydropower dams and constrain energy generation – a significant export for the country.
- Women empowerment in water governance and management will result in improved and gender-sensitive decisions concerning the protection and management of community and household assets, including those of vulnerable communities.

Social Benefits

- Women, facing heightened vulnerability to climate risks due to their engagement in household activities, will benefit from various social protection measures proposed in the climate resilience interventions in water for drinking and water and irrigation.
- Women and children especially will benefit from improved sanitation due to enhanced water availability.
- The integrated water resources management proposed for drinking and irrigation purposes is expected to increase water availability and foster dialogue among communities, ultimately reducing disputes over water in the long term. Currently, many water-related conflicts between communities in Bhutan have been resolved only through legal means, providing only partial contributions to social well-being.
- The formalization of Water User Associations (WUAs) will promote equitable sharing of water resources among community members, especially at the grassroots level, leading to inclusive decision-making in water governance and management.
- Active participation by community members in watershed management, and Sustainable Land Management (SLM) implementation is also anticipated to improve social capital within the community.
- The project will conduct assessments of existing policies and work towards creating a more inclusive and enabling policy environment, fostering coordination and collaboration among stakeholders, with increased participation from underrepresented groups.
- Inclusive participation in adaptation planning will shed light on the specific needs of marginalized groups, including women, children, and the elderly.
- As a result, the local climate resilience interventions planned at the local government (LG) level will promote the protection of economic and social rights by reducing vulnerability and supporting disaster risk reduction.
- The project aims to identify vulnerable and marginalized households in consultation with representatives from each beneficiary community during the first six months of implementation. These vulnerable groups include households in isolated settlements, communities without motorable access roads, households with only elderly members or without a labor force, households with very few members, households with no resident members, women, and households headed by divorcees. Recognizing the challenges these groups may face in actively participating in the project, such as community labor contributions, the project will ensure their inclusion by not requiring cash or labor contributions during implementation.
- Water infrastructure's operation and maintenance, developed by the project, will be managed by WUAs, with minor maintenance contributions from member households. The articles of association of the WUAs will include clauses granting community exemptions for contributions from vulnerable and marginalized groups. These articles of association will be developed with

support from the Project Management Unit (PMU) and concerned dzongkhags during the project implementation and will emphasize equal access for all community members.

Avoidance/mitigation of potential negative impacts

- The Bhutan Trust Fund for Environmental Conservation (BTFEC) is mandated to promote environmentally sound and sustainable development in all its programs. Consequently, the screening of projects to identify potential negative impacts is an integral part of its internal processes. Given the nature of the intervention, which primarily focuses on environmental improvement and societal benefits, and the strict adherence to national regulations and standards (as outlined in section E), the risk of impacts is low.
- To better comprehend the potential effects of the proposed activities, specific studies will be conducted for each component, with particular emphasis on assessing environmental and social risks. Any identified risks, no matter how minor, will be accompanied by appropriate mitigation proposals. This approach is crucial, especially in a delicate environment with competing demands on natural resources.
- A comprehensive Gender Assessment has been undertaken, and a Gender Action Plan (Annex2) has been developed to systematically identify, address, and mitigate gender-related risks throughout project implementation. The Gender Action Plan will guide gender-responsive and inclusive decision-making processes, ensuring equitable participation and benefit-sharing among all stakeholders. Furthermore, the project will ensure that women constitute at least 30% of participants in all project-related consultations, meetings, capacity-building activities, and training programmes, thereby promoting meaningful and effective engagement of women in project planning and implementation.

- A project-level Environmental and Social Management Plan (ESMP) has been developed based on the environmental and social risks and impacts identified through consultations with project stakeholders (Annex3). The ESMP provides a comprehensive framework for the management, mitigation, monitoring, and reporting of potential environmental and social risks throughout project implementation. Effective implementation of the ESMP will ensure that adverse environmental and social impacts are avoided, minimized, or mitigated, thereby safeguarding communities and ecosystems and ensuring that project activities do not result in significant negative environmental or social consequences.
- Gender participation in the project activities during the project implementation will be monitored by the M& E officer under the PMU and the local monitoring committee.

- During the initial six months of project implementation, the Gender Action Plan (GAP) and ESMP will be reviewed and revised by the Environmental Social Safeguards and Gender Expert. This revision will be based on the evolving project activity designs, particularly for the drinking water and irrigation schemes, as specific details emerge.
- To enhance community engagement, dedicated monitoring teams made up of residents will be established. These teams will be responsible for overseeing environmental changes, economic advancements, and social progress associated with the project.

C. Describe or provide an analysis of the cost-effectiveness of the proposed project / programme., focusing on the implementation and execution arrangements, in particular the mechanism which will provide more direct access to finance.

In the Bhutanese context, where natural resources hold a central position in society and the economy, Ecosystem-based Adaptation (EbA) emerges as the most sustainable and cost-effective method to enhance resilience and reduce vulnerability to climate change impacts[91]. EbA not only provides a foundation for human systems to flourish, primarily through vigorous provisioning services, but it also enhances resource management. For instance, employing a sound EbA approach, coupled with an integrated watershed management strategy, would eventually reduce water treatment costs at user ends.In terms of irrigation infrastructure development, the adoption of environmentally friendly and durable methods brings about a transformative impact in Bhutan,[92] particularly by enhancing agricultural productivity (given that over 60% of the population is engaged in agriculture) and improving public health. The project introduces climate-smart technologies and HDPE pipeline interventions for irrigation, which, over time, result in minimal maintenance costs and increased water usage efficiency by reducing conveyance losses. When compared to conventional concrete lining or structures for irrigation, which might seem initially cheaper, the climate-resilient approach through HDPE pipelines proves to be more cost-effective in the long run due to its extended lifespan, lower maintenance costs, and higher adaptability to climate risks, thus reducing potential environmental impacts. The construction of irrigation channels using conventional methods with cement concrete incurs higher initial investment than the HDPE pipes. For the concrete channel of the same size with the same discharge, the costs are estimated to BTN. 3558.44/- (~US$ 43) per meter whereas HDPE pipes would cost BTN. 3152.87 (~US$ 38) per meter. Open concrete channels also incur higher recurrent cost for clearing the clogged surfaces and other maintenance works. In addition, considerable time of the Water User Group members is required in clearing the channels. While the fusion welding process used for joining HDPE pipes creates a monolithic system that eliminates potential leakage points. The pipes also don't get blocked often and can be easily cleared. The concrete channels also require frequent recurrent maintenance due to leakages. Considerable funds are spent in routine maintenance works. While the HDPE pipeline is sustainable for at least 10-15 years reducing maintenance costs and adapting better to climate risks.

In addition, HDPE pipes are enclosed systems, which drastically reduces water loss due to evaporation, a common issue faced by open concrete channels. The detailed cost comparison analysis done by the District Engineers is provided as Annex 6.

Various types of land degradation in Bhutan, particularly water-induced degradation such as gullies, landslides, and ravine formation, significantly impact agricultural productivity and livelihoods. With the project's support on Ecosystem-based solutions, such as eco-restoration plantations, spring revivals, contour trenching, check dams, etc. surface runoff and soil erosion will be mitigated, leading to improved soil fertility and moisture retention. To address challenges faced by farmers in implementing SLM/Ecosystem-based interventions, alternative approaches such as informal labor-sharing groups and community mobilization have proven successful and are being replicated in other areas.

Climate-related extremes like heat waves, droughts, floods, and wildfires have exposed ecosystems and human systems to current climate variability, making them vulnerable. The project aims to enhance resilience by strengthening community-based forest fire management groups to minimize the impacts of climate-induced disasters, particularly forest fires.

Furthermore, the expected results align with existing national plans, such as the target to ensure 24/7 safe and reliable drinking water supply for every household. However, current means are insufficient to meet all the country's needs, and the proposed project seeks to address this gap.

[91] Department of Environment and Climate Change (2023). National Adaptation Plan for the Kingdom of Bhutan.

[92] World Bank (2019). Climate Smart Agriculture-Country Profile Bhutan.https://climateknowledgeportal.worldbank.org/sites/default/files/2019-06/CSA-in-Bhutan.pdf

D. Describe how the project / programme is consistent with national, sub-national and local sustainable development strategies, including, where appropriate, national adaptation plan (NAP), national, sub-national or local development plans, poverty reduction strategies, national communications, or national adaptation programs of action, or other relevant instruments, where they exist.

The following table highlights the relevant national, subnational strategies, policies, plans and instruments aligned with this project proposal.

Table 5 Policies and Strategic Alignment with the Project

Name of Strategy / Policy / Plan	Alignment with the Proposed LLA Project
National Adaptation Plan (NAP) of the Kingdom of Bhutan, 2023	The project directly supports the NAP's priority adaptation sectors, particularly water resources, agriculture, and forests and biodiversity. It contributes to reducing climate vulnerability, strengthening adaptive capacity, restoring watersheds, protecting water sources, enhancing climate-resilient agriculture, and integrating adaptation actions into local development planning.
Thirteenth Five-Year Plan (13th FYP) 2024–2029	The proposal contributes to the FYP's Ecological Diversity and Resilience Programme, supporting climate resilience, sustainable water management, ecosystem restoration, disaster risk reduction, and improved rural livelihoods. The project contributes to national KPIs related to water security, environmental sustainability, resilient local development, and climate adaptation.
Climate Change Policy of the Kingdom of Bhutan, 2020	The project operationalizes Policy Objective 2 (Building Resilience to Climate Change) by strengthening adaptation measures in water resources, agriculture, ecosystems, and local governance. It also supports inclusive and coordinated climate action while protecting vulnerable communities from climate-induced risks.
National Environment Strategy (NES) 2020–2030	The project advances NES objectives related to environmental sustainability, watershed conservation, climate-resilient infrastructure, ecosystem restoration, sustainable agriculture, and improved access to reliable water resources. It contributes to maintaining ecosystem integrity while enhancing community resilience to climate change.
Bhutan Water Policy, 2007	The project promotes integrated and sustainable management of water resources through source protection, groundwater recharge, spring-shed management, equitable access to water, and community participation in water governance, consistent with the principles of the Water Policy.
Water Act of Bhutan, 2011	The project supports the Act's objective of protecting, conserving, and managing water resources in an environmentally sustainable, socially equitable, and economically efficient manner. Activities such as watershed restoration, water-source protection, and community water management contribute directly to implementation of the Act.
Water Regulation of Bhutan, 2014	The project supports implementation of the Water Regulation by strengthening community-based water management, promoting Water Users' Associations, improving watershed management, and supporting integrated water resources planning at local levels.

National Forest Policy of Bhutan, 2011	The project aligns with the policy objective of maintaining healthy forest ecosystems and watershed functions while ensuring sustainable resource management and biodiversity conservation. Catchment restoration, afforestation, and community forest management activities directly contribute to these objectives.
Forest and Nature Conservation Rules and Regulations (FNCRR), 2023 (amended 2025)	The project supports implementation of the updated forest governance framework through landscape restoration, protection of critical water sources, sustainable forest management, biodiversity conservation, and community stewardship of natural resources.
National Irrigation Policy (Revised 2012)	The project contributes to increasing irrigation water reliability and efficiency through climate-resilient irrigation systems, improved water harvesting, equitable water allocation, and community-based irrigation management, thereby strengthening agricultural productivity under changing climate conditions.
Bhutan Nationally Determined Contribution (NDC), 2021	The project contributes to Bhutan's NDC commitments on climate adaptation through watershed protection, climate-resilient agriculture, ecosystem-based adaptation, water security enhancement, and strengthening resilience of vulnerable rural communities.
Water Sector Roadmap for Implementation of the National Adaptation Plan (2024 onwards)	The project directly supports the Water Sector Roadmap by addressing climate-induced water stress through spring-source protection, watershed restoration, integrated water resources management, and adaptation interventions in vulnerable rural communities.
Agrifood Sector (Agriculture) Roadmap for NAP Implementation	By promoting climate-resilient agriculture, water-efficient farming systems, drought-resilient production practices, and livelihood diversification, the project contributes to the implementation of priority adaptation actions identified for the agriculture sector.
National Environment Protection Act, 2007	The project contributes to the protection and improvement of environmental quality through sustainable watershed management, prevention of land degradation, conservation of ecosystem services, and promotion of environmentally sound local development practices.
Gross National Happiness (GNH) Development Framework and Bhutan 21st Century Economic Roadmap	The project advances environmentally sustainable and climate-resilient development while strengthening community wellbeing, water security, local livelihoods, ecosystem services, and inclusive participation of vulnerable groups. The project contributes to Bhutan's vision of achieving a resilient, inclusive, and sustainable high-income GNH economy

E. Describe how the project / programme meets relevant national technical standards, where applicable such as standards for environmental assessment, building codes, etc., and complies with the Environmental and Social Policy of the Adaptation Fund. Also describe, as needed, how the project/programme will provide support to local actors and build their capacities to comply with the standards.

The project will fully comply with Bhutan's environmental, forestry, land, water, and development legislation as well as the Adaptation Fund Environmental and Social Policy. Compliance will be ensured through environmental and social screening, acquisition of required clearances and permits, adherence to national technical standards and guidelines, regular monitoring by relevant government agencies, and capacity-building programmes targeting Dzongkhag, Gewog, and community-level stakeholders.

Table 6 Relevant National Technical Standards

Outcome / Output	**AF ESP Principle**	**Compliance with Relevant Legal or Technical Standards**	**Institution Responsible for Standard Compliance**	**Compliance: How It Will Be Fulfilled**
Outcome 1: Increased ecosystem resilience in response to climate variability and climate-induced stress				
Output 1.1 Water Resource Management and Governance strengthened	Compliance with Law; Access & Equity; Marginalized & Vulnerable Groups; Climate Change	• Constitution of Bhutan 2008 Water Act of Bhutan 2011 • Water Regulation of Bhutan 2014 • National Environment Protection Act 2007 • National Integrated Water Resource Management Plan, 2016 • National Adaptation Plan 2023 • Forest and Nature Conservation Act, 2023	Department of Water (DoW); Thimphu Dzongkhag; Gewog Administrations; PMU	• Wangchhu River Basin Management Plans will be developed based on the National Integrated Water Resources Management Plan and the Water Act •Micro Hydro-meteorological stations will be established following DoW standards and protocols. • Annual compliance monitoring and reporting will be undertaken through the project M&E framework.

Output 1.2 EbA Solutions and Sustainable Land Management (SLM) implemented	Biodiversity Conservation; Natural Habitats; Climate Change; Compliance with Law	• Forest and Nature Conservation Act 2023 • Forest and Nature Conservation Rules and Regulations, 2023 and amendments (2025) • Forest & Nature Conservation Code of Best Management Practices 2021 •Forest Monitoring and Evaluation Framework, 2024 • Watershed Management Guidelines • Rapid Watershed Classification Guidelines • Six-Step Protocol for Springshed Revival • Agriculture and Land Development Guidelines 2017 • Guidelines for Cost Sharing Mechanism for Agri-Food Sector 2025	DoFPS; DoW; Department of Agriculture; Thimphu Dzongkhag Administration	• All restoration plantations will use approved native species and nursery standards. • Watershed restoration interventions will follow approved watershed management and springshed restoration protocols. • Activities will be screened to avoid impacts on critical habitats and biodiversity. • Technical supervision will be provided by DoFPS and relevant line agencies. • Restoration (plantation) effectiveness and environmental compliance will be monitored in line with Forest Monitoring and Evaluation Framework, 2024.
Output 1.3 Forest Fire Hazard Management strengthened	Climate Change; Public Health; Biodiversity Conservation; Compliance with Law	• Forest and Nature Conservation Act 2023 • Forest and Nature Conservation Rules & Regulations 2023 and its amendments (2025) • National Environment Protection Act 2007	DoFPS; Inter-Agency Forest Fire Coordinating Groups; Gewog Forest Fire Coordinating Groups	• Establishment of Gewog Forest Fire Coordinating Groups in accordance with FNCRR, 2023. • Procurement and use of firefighting equipment following government standards. • Annual monitoring of fire management effectiveness through DoFPS reporting systems.
Outcome 2: Ensured access to safe and reliable drinking water and irrigation water				

Output 2.1 Climate-resilient drinking water infrastructure established	Human Rights; Public Health; Compliance with Law; Access & Equity; Gender Equality	• Water Act of Bhutan 2011 • Water Regulation of Bhutan, 2014 • Bhutan Drinking Water Quality Standards (BDWQS, 2025) • National Environment Protection Act, 2007 • Regulation for Environmental Clearance of Projects, 2016 • Bhutan Schedule of Rates (BSR) 2025 • • Bhutan Standards Act 2010 • Rural Water Supply Design Manual, 2025; • Inclusive and Climate Resilient Guideline for Rural Water Supply Services (2024/2025); • Sanitation and Hygiene Guidelines, 2014; • National Sanitation and Hygiene Policy, 2020; • Climate-Resilient Rural Water Safety Planning Facilitator's (CR-RWSP Guide, December 2024; •Climate-Resilient and Inclusive Rural Water Caretaker Trainer's Manual, December 2024	Department of Infrastructure Development (DoID); Department of Water; RCDC, MoH; DoPH, MoH; Thimphu Dzongkhag Engineering Sector; NEC Competent Authority; MoICE	• Detailed engineering design and construction will comply with BSR 2025 and sector engineering standards. • Drinking water quality will comply with BDWQS 2016 (revised 2025). • Environmental clearances and Initial Environmental Examination (IEE), where required, will be obtained before construction. • Community water supply systems will be operated through WUAs and monitored through regular water quality testing. • Construction supervision and completion certification will follow government quality assurance procedures.

Output 2.2 Climate-resilient irrigation systems established and improved	Compliance with Law; Livelihoods; Climate Change; Access & Equity	• Water Act 2011 • Water Regulation 2014 • National Irrigation Policy • National Irrigation Plan • Agriculture and Land Development Guidelines 2017 • Bhutan Schedule of Rates 2025	Department of Water; Department of Agriculture; DoID; Dzongkhag Administration	• Irrigation systems will be designed and constructed according to national irrigation standards. • Water abstraction will comply with environmental flow requirements specified under the Water Act and Water Regulations. • HDPE pipelines and climate-resilient designs will comply with government engineering specifications. • Environmental clearance requirements and safeguard measures will be incorporated into implementation contracts and supervision arrangements.
Outcome 3: Increased resilience of local communities through enhanced adaptation planning and implementation capacity				
Output 3.1 Water User Associations strengthened and formalized	Access & Equity; Marginalized & Vulnerable Groups; Gender Equality	•The Bhutan Water Act of Bhutan 2011 • The Water Regulation of Bhutan 2014 •National Gender Equality Policy (NGEP), 2020 •The Guidelines for Formation and Registration of WUAs in Bhutan (2024)	Department of Water; Gewog Administrations; Dzongkhag Administration	• Water governance systems and WUAs will be formalized according to the Water Act and associated regulations. • WUA bylaws will be reviewed and updated to ensure compliance with regulations and • Participation and engagement of women in WUA will be ensured (30% office bearers should be women).

Output 3.2 Local adaptation planning and implementation capacities strengthened	Gender Equality; Compliance with Law; Access & Equity	• Adaptation Fund Environmental and Social Policy • National Environment Protection Act 2007 • Bhutan Schedule of Rates 2025 •Environmental Clearance Procedures 2016 • Community Contracting Protocol (2021) •Forest and Nature Conservation Rules and Regulations 2023 and amendment (2025) •Financial Rules and Regulations (FRR 2016) •Local Development Planning Manual 2021 •Local Government Act 2009. •Local Government Rules and Regulation 2012 •National Policy on Gender Equality (2020) •13th FYP Guidelines. •National Disability Policy (2019) •Gross National Happiness (GNH) Policy Framework •Disaster Management Act of Bhutan 2013. •Disaster management Rules and Regulation 2014. •Protocol for Local Government proceedings.	PMU; Thimphu Dzongkhag; Department of Local Governance and Disaster Management (DLGDM); Relevant Line Agencies	• Training modules will include financial management, environmental clearance, forestry clearance, social and environmental safeguards, gender mainstreaming, M&E, procurement, and infrastructure quality standards. • Compliance awareness and capacity assessments will be conducted before and after training. • Participants will include Gewog officials, local leaders, WUA members, community representatives and vulnerable groups.

Output 3.3 Project knowledge management and learning strengthened	Transparency; Accountability; Access to Information	• BTFEC M&E Framework (2017) • Adaptation Fund Results Framework • Adaptation Fund ESP and Gender Policy	PMU; BTFEC; BES; Dzongkhag Administration	• Annual learning workshops and knowledge-sharing events will monitor and document compliance lessons.

The project recognizes that sustained compliance with national legal, technical, environmental, social, and fiduciary standards depends on the capacity of local institutions and community actors that are directly involved in the planning, implementation, operation, and maintenance of project interventions. Therefore, the project includes a comprehensive capacity-building programme targeted at Gewog Administrations, Dzongkhag sector officials, Water User Associations (WUAs), Community Forest Fire Management Groups, local leaders, contractors, community monitors, women's groups, youth representatives, and vulnerable households.
The capacity-building approach will be implemented through a combination of training workshops, on-site mentoring, exposure visits, practical demonstrations, coaching by technical agencies, and community-based monitoring systems. Emphasis will be placed on strengthening the ability of local institutions to comply with national technical standards and the Adaptation Fund Environmental and Social Policy throughout the project cycle.

Technical Capacity Development
The project will strengthen technical capacities of local governments and community groups to ensure that drinking water supply systems, irrigation schemes, watershed restoration activities, and ecosystem-based adaptation interventions are designed, implemented, operated, and maintained in accordance with applicable national standards and guidelines. Technical support will be provided by the Department of Water, Department of Forests and Park Services, Department of Agriculture, Department of Infrastructure Development, and other relevant agencies.

Training modules will include:

- Bhutan Water Act 2011 and Water Regulation 2014;
- Bhutan Drinking Water Quality Standards (BDWQS) 2025;
- National Irrigation Plan and irrigation design standards;
- Forest and Nature Conservation Act 2023 and related regulations;
- Watershed Management Guidelines and Springshed Revival Protocols;
- Norms and Standards for Nursery and Plantation 2020;
- Forest and Nature Conservation Code of Best Management Practices, 2021
- Climate-resilient infrastructure design and construction standards;
- Bhutan Schedule of Rates (BSR-2025);
- Operation and maintenance of water supply and irrigation infrastructure.

Strengthening Environmental and Social Compliance

To ensure compliance with the Adaptation Fund Environmental and Social Policy and Bhutan's environmental legislation, dedicated training will be provided on:

- Environmental screening procedures;
- Initial Environmental Examination (IEE) requirements;
- Environmental Clearance processes;
- Forestry Clearance procedures;
- Environmental and Social Management Plan (ESMP) implementation;
- Occupational Health and Safety standards;
- Grievance Redress Mechanism (GRM);
- Environmental monitoring and reporting requirements;
- Biodiversity conservation and environmental flow requirements.

Local community members will participate in environmental monitoring and safeguard implementation through community-based monitoring committees established under the project. These committees will assist in identifying compliance issues, monitoring environmental and social impacts, and providing feedback to project implementers.

Gender Equality and Social Inclusion Capacity Building

The project will ensure that local actors are equipped to implement national and Adaptation Fund gender and social inclusion requirement.

F. Describe if there is duplication of project / programme with other funding sources, if any. Describe how the project/programme will ensure coordination of different initiatives, sub-projects and small grants towards a common goal, enhances collaboration across sectors and outlines how activities avoid duplication and enhance efficiencies and good practice.

The Ministry of Finance (MoF) serves as the central planning and coordination body of the Royal Government of Bhutan (RGoB). Its primary responsibility is to ensure that all development activities within the country align with the government's priorities and avoid any duplication between project interventions. Regardless of the implementing agencies involved, any external or internal funding directed towards Bhutan must pass through the MoF This proposed project complements some of the ongoing and forthcoming projects funded through the Green Climate Fund (GCF), Global Environment Facility (GEF), and GEF Least Developed Countries Fund (GEF-LDCF).

The Ministry of Finance (MoF) acts as the central coordinating agency, ensuring effective collaboration and non-duplication between projects by utilizing existing practices like the national and annual implementation performance agreements of various agencies. As the National Designated Authority (NDA) and Designated Authority (DA) to the Green Climate Fund (GCF) and Adaptation Fund (AF) respectively, MoF ensured systematic coordination of projects, primarily through the Project Management Unit (PMU) coordination. This approach facilitated enhanced cooperation and minimized redundancy across the projects.

Table 7 Alignment with other projects

Name of Project / Programme	Details of the Project	Start Date	Details of Synergy / Type of Partnership	Mitigation Methods to Prevent Duplication
Supporting Climate Resilience and Transformational Change in the Agriculture Sector in Bhutan (GCF FP107)	Promotes climate-resilient agriculture and sustainable water management for smallholder farmers in eight Dzongkhags through irrigation improvement, climate-smart agriculture, and livelihood diversification.	2020	Knowledge sharing, technical collaboration, and exchange of climate-resilient agriculture practices.	Different geographical focus and beneficiary communities. Lessons learned and technical tools will be shared while avoiding overlap in field investments.
Securing Ecological Connectivity of High Conservation Value Areas (GEF)	Supports biodiversity conservation, watershed protection, ecological connectivity, human-wildlife conflict mitigation, and sustainable land-use planning in southwestern Bhutan, including parts of Thimphu District.	2020	Collaboration on watershed conservation, ecosystem restoration, and landscape-level planning.	The proposed project focuses on water security and community adaptation, while the GEF project focuses on biodiversity and ecological connectivity. Joint planning will ensure complementary interventions.
Climate Adaptation, Resilience and Engagement in Local Governments (CARE-LG) (GCF SAP038)	Establishes an adaptation grant facility supporting vulnerable Gewogs across Bhutan for local climate-resilient infrastructure, disaster risk reduction, and community adaptation initiatives.	2024	Coordination through local governments, sharing -adaptation planning methodologies, vulnerability assessments, and capacity-building approaches.	Target Gewogs and investments will be mapped during annual planning. The Technical Advisory Committee will ensure complementary financing and prevent overlap in local adaptation investments.

Adaptation to Climate-Induced Water Stresses through Integrated Landscape Management in Bhutan (ACREWAS) (Adaptation Fund)	Enhances watershed management, spring restoration, water security, sustainable land management, and climate resilience in Dagana, Tsirang, Paro, and Mongar Dzongkhags.	2023	Strong synergy on water resource management, watershed restoration, spring-shed management, and community-based adaptation approaches.	Geographic focus differs from Thimphu District. Lessons, technologies, and monitoring systems will be shared while maintaining distinct implementation areas.
Innovative Adaptation Financing to Build the Resilience and Adaptive Capacity of Smallholder Farmers in Bhutan (InAF-Bhutan) (Adaptation Fund Innovation Project)	Pilots innovative financing mechanisms and resilience-building investments for climate-vulnerable farming communities.	2024	Knowledge exchange on climate finance mechanisms, resilience financing models, and community engagement approaches.	The proposed project does not finance agricultural credit mechanisms; therefore, it complements rather than duplicates the innovation project.
Enhancing Climate Resilience of Urban Landscapes and Communities in the Thimphu–Paro Region (ECRUL) (GEF-LDCF)	Strengthens urban climate resilience through watershed restoration, stormwater management, climate-resilient urban planning, and early warning systems in Thimphu and Paro.	2025	Collaboration on urban watershed protection, hydrological monitoring, disaster risk management, and water resource planning.	The proposed project focuses on rural Gewogs and community water security, while ECRUL addresses urban resilience and municipal infrastructure. Joint planning and data exchange will ensure complementarity.

G. If applicable, describe the learning and knowledge management component to capture and disseminate lessons learned and how this contributes to building and institutionalizing local capabilities. Provide details on managing traditional and/or indigenous knowledge, where relevant.

The project recognizes the significance of knowledge management in ensuring the long-term success of climate change adaptation goals. It aims to document and share valuable information and knowledge gathered throughout its implementation to facilitate broader communication and dissemination of project lessons and experiences. This sharing will support the replication and scaling-up of successful project outcomes.
To achieve this, the project will establish and enhance the existing knowledge management system and implement appropriate communication models to disseminate information on climate change adaptation. Key lessons learned and best practices will be well-documented for wider dissemination through various platforms, including meetings, social media, and publications.

The project will promote knowledge exchange mechanisms through study visits among communities and organizations, fostering capacity building to enhance understanding and implementation of adaptation measures. The potential outputs of this knowledge management endeavor encompass evaluation materials,

improved data management, enhanced interpretation and dissemination capacity, policy information sharing and mainstreaming, cross-cutting capacity building, and success stories.

Through systematic documentation, the project aims to make accumulated information and knowledge easily accessible to future project implementers, facilitating the replication of successful experiences in similar projects. Furthermore, case studies and technical reports will be compiled to capture the lessons learned and best practices, making them available for national and international meetings.

The project will develop a targeted communication strategy to publish and share functional achievements emanating from project activities and knowledge-sharing events. Social media, the official website, and government portals will be used as platforms for dissemination. Local people at the grassroots level will be involved to enhance the transfer of technical knowledge from experts to the community, meeting future skill requirements for project maintenance.

The assessment of Indigenous and Local Knowledge (ILK) related to water management and Ecosystem-based Adaptation (EbA) confirmed that traditional ecological knowledge remains a living, actively practiced system across the five target Gewogs of Thimphu Rural District (Kawang, Mewang, Genekha, Chang and Dagala). The findings are based on a triangulation of literature review, a household survey of 231 households, and community consultations involving 170 participants (Annex 4).

The following are recommended from the assessment:

- **Mainstream Indigenous Knowledge into Adaptation Planning and Implementation**.

The project should systematically integrate traditional water management practices, including watershed protection, spring conservation, rotational water allocation, and community stewardship mechanisms, into the design and implementation of all water security and EbA interventions. This approach will enhance local ownership, strengthen sustainability, and improve the long-term effectiveness of adaptation investments.

- **Strengthen Community-Based Watershed and Spring Protection Systems.**

Existing traditional conservation measures, such as protection of sacred water sources, tree planting around springs, maintenance of vegetation buffers, restrictions on tree felling and grazing in catchments, and community monitoring of watersheds, should be formally supported and incorporated into project-supported watershed restoration and spring-shed management programs.

- **Establish a Community-Led Indigenous Knowledge Documentation and Learning System**.

The project should document traditional water governance arrangements, seasonal calendars, sacred sites, customary practices, ecological forecasting indicators, and locally adapted climate-resilience measures to preserve knowledge, support intergenerational learning, and address the gradual erosion of traditional practices.

- **Strengthen Water User Associations as Local Adaptation Institutions.**

The project should enhance the institutional, technical, and financial capacities of WUAs while formally integrating customary governance structures, including *Chusubs, Tshogpas*, village elders, and traditional conflict-resolution mechanisms. This will strengthen community-led operation, maintenance, and governance of climate-resilient water infrastructure.

- **Promote Inclusive and Equitable Water Governance**.

WUA by-laws and water management arrangements should be reviewed and strengthened to ensure equitable access to water and meaningful participation of women, poorer households, tenants, persons with disabilities,

and other vulnerable groups. The project should ensure that adaptation benefits are distributed fairly and that existing social inequities are not reinforced.

- **Scale Up Climate-Resilient Water Harvesting and Storage Systems**.

Building on successful traditional practices, the project should support community water tanks, rainwater harvesting systems, storage ponds, spring recharge measures, and other locally proven technologies that improve water availability during dry periods and enhance resilience to climate variability.

- **Recognize and Institutionalize Customary Practices that Support Collective Action**.

Newly documented indigenous practices, including ***Gyen*** (rotational community responsibility for maintenance of shared assets) and ***Dedrik*** (community-based land adjustment arrangements for public infrastructure), should be incorporated into project governance and implementation frameworks to strengthen community ownership, reduce conflicts, and improve sustainability of project investments.

- **Integrate Cultural Heritage and Spiritual Values into Project Safeguards**.

Project planning and implementation should respect sacred sites, water-source taboos, traditional rituals, and customary resource-use practices. Participatory screening and consultation processes should be undertaken prior to infrastructure development to identify culturally sensitive areas and ensure that all necessary community and religious clearances are obtained.

- **Strengthen Women's Leadership in Climate Adaptation and Water Governance**.

Recognizing the central role of women in maintaining and transmitting indigenous knowledge, the project should promote women's participation and leadership in WUAs, community decision-making, capacity-building programs, and knowledge-management initiatives. Specific targets should be established to ensure meaningful representation and influence of women throughout project implementation.

- **Promote Hybrid Knowledge Systems for Climate Resilience.**

The project should foster the integration of indigenous knowledge with scientific research, climate information services, and modern engineering solutions to develop locally appropriate, evidence-based, and culturally accepted adaptation measures that enhance long-term resilience and sustainability.

During the project implementation phase, the project will adopt a locally led adaptation approach that builds on Indigenous and Local Knowledge, traditional governance systems, and ecosystem-based water management practices. It will strengthen community-led watershed protection, climate-resilient water harvesting and storage systems, and inclusive water governance institutions while documenting and preserving indigenous knowledge for future generations. The project will formally recognize customary resource-management practices and community institutions, promote women's leadership, integrate cultural heritage considerations into project safeguards, and combine indigenous knowledge with scientific and technical innovations to enhance water security, climate resilience, and sustainable natural resource management across the target Gewogs.

Key lessons learned from past and ongoing Sustainable Land Management (SLM)/Ecosystem based solutions will be considered during project design and will be adopted during implementation. These include the use of participatory EbA & SLM action planning to enhance community ownership and commitment, the implementation of EbA & SLM measures through group approaches to leverage labor resources and generate social co-benefits, and the adoption of a focused approach rather than spreading resources too thinly to achieve impactful results. Additionally, the project will support long-term SLM/Ecosystem based Solutions interventions with short-term benefits to mitigate opportunity costs for landowners and resource-poor farmers, ensuring tangible benefits are experienced during the project period.

H. Describe the consultative process, including the list of stakeholders consulted, undertaken during project preparation, with particular reference to vulnerable groups, including gender considerations, in compliance with the Environmental and Social Policy and Gender Policy of the Adaptation Fund. Provide details on how the consultative process considered and addressed gender-based, economic and other inequalities and encouraged vulnerable and marginalized individuals to meaningfully participate in and lead adaptation decisions.

The preparation of the full proposal for the project, "Securing Water and Enhancing Climate Resilience in Thimphu (Rural) District, Bhutan," was guided by a participatory, inclusive, and locally led consultation process undertaken between May 2025 and July 2026. The consultation process was designed to ensure compliance with the Adaptation Fund Environmental and Social Policy (ESP) and Gender Policy, while upholding the core principles of locally led adaptation, including inclusiveness, transparency, accountability, and empowerment of vulnerable communities. The consultations aimed to ensure that project priorities, interventions, and institutional arrangements were informed by the needs, perspectives, and knowledge of local stakeholders, particularly vulnerable and marginalized groups affected by increasing climate-related water insecurity.

Stakeholders Consulted

The project engaged a broad spectrum of stakeholders at national, district, gewog, and community levels. These included:

- Department of Macro-Fiscal and Development Finance (DMDF), Ministry of Finance (Designated Authority);
- Bhutan Trust Fund for Environmental Conservation (National Implementing Entity);
- Bhutan Ecological Society (Project Formulation Partner);
- Department of Water (DoW);
- Department of Forests and Park Services (DoFPS);
- Department of Infrastructure Development (DoID);
- Department of Agriculture (DoA);
- Department of Local Governance and Disaster Management (DLGDM);
- Department of Environment and Climate Change (DECC);
- National Center for Hydrology and Meteorology (NCHM);
- Thimphu Dzongkhag Administration;
- Gups and Gewog Administrative Officers (GAOs) of Chang, Kawang, Mewang, Dagala and Genekha Gewogs;
- Engineers, forestry, agriculture and livestock extension personnel;
- Community representatives and beneficiaries from the five target gewogs;
- Existing and prospective Water User Associations (WUAs);
- Schools and local institutions;
- Women, youth, elderly persons, and other vulnerable community members

Consultation Methodology

The consultation process consisted of:

1. National and technical coordination meetings with implementing and executing agencies;
2. Technical Working Group (TWG) meetings to guide proposal formulation;
3. Community-level public consultations in all five target gewogs;
4. Focus group discussions
5. Field assessments and validation visits;
6. Technical feasibility discussions and project design workshops;
7. Review and validation meetings involving local governments and sector agencies.

The first round of public consultations was conducted across Chang, Kawang, Mewang, Dagala, and Genekha Gewogs from 30 December 2025 to 10 January 2026, specifically to gather community perspectives on water scarcity challenges, validate proposed investments, identify safeguarding concerns, and capture local adaptation priorities. The consultations also included field visits to proposed project sites and direct engagement with beneficiary communities.

Consideration of Vulnerable Groups and Gender Equality

In accordance with the Adaptation Fund Gender Policy, special efforts were made to ensure meaningful participation by those most affected by climate-induced water stress. Consultations were organized at community level within the target gewogs to reduce barriers to participation and provide opportunities for local stakeholders to directly influence project design. Local governments were requested to mobilize stakeholders from communities, schools, agriculture, livestock and forestry services to ensure broad representation and inclusion.

The consultation process recognized that women, smallholder farmers, remote rural households, the elderly, and economically disadvantaged groups are among those most affected by declining water availability and climate variability. Discussions focused on understanding how water shortages affect livelihoods, domestic water collection responsibilities, irrigation access, agricultural productivity, and household resilience. These inputs directly informed the prioritization of drinking water and irrigation investments, ecosystem-based adaptation measures, and capacity-building activities included in the project design.

Furthermore, project stakeholders agreed that proposal development must remain participatory, gender-responsive, and driven by extensive stakeholder engagement. The approved Terms of Reference for the Technical Working Group explicitly require members to ensure that project development is participatory and gender-responsive, and that relevant stakeholders continue to be consulted throughout project preparation and implementation.

Safeguards, Inclusion and Meaningful Participation

Environmental and social safeguards were integrated into the consultation process from the outset. TWG members emphasized the importance of environmental and social risk management, grievance redress mechanisms, land and environmental clearances, and stakeholder consultation throughout project formulation. Stakeholders agreed that Environmental and Social Management Planning, Gender Action Planning, and social assessments would be incorporated into the full proposal and linked directly to community consultations.

The consultation process also encouraged local leadership and ownership by involving Gups, GAOs, community representatives, and prospective Water User Associations in validation of activities, identification of implementation challenges, and prioritization of adaptation measures. Communities were not merely consulted but were actively involved in reviewing water source conditions, confirming project feasibility, validating proposed interventions, and identifying local contributions for implementation and maintenance.

Addressing Gender-Based, Economic and Social Inequalities

The consultation process sought to address inequalities by creating opportunities for local communities to participate directly in project planning and decision-making. Consistent with the principles of Locally Led Adaptation, stakeholders emphasized that adaptation decisions should be influenced by local knowledge and community priorities rather than being driven solely by central agencies. During TWG consultations, it was repeatedly emphasized that local governments, Water User Associations, and community institutions would play key roles in project implementation and governance.

Attention was given to ensuring that adaptation benefits would reach communities experiencing water scarcity and limited adaptive capacity. Public consultations assessed community needs, labor

contributions, water access challenges, source reliability, and willingness to participate in local management structures. All five gewogs confirmed support for establishing and strengthening Water User Associations, which will enable equitable and inclusive participation in water governance and long-term resource management.
Stakeholders also highlighted the need for capacity-building activities to strengthen local adaptation planning, implementation, and management capabilities. The project therefore includes targeted capacity development for local governments, community institutions, and user groups, enabling vulnerable groups to participate more effectively in decision-making processes and benefit from adaptation investments.

Focus Group Discussions (FGDs) were conducted with representatives from target gewog communities to gain a comprehensive understanding of gender roles, responsibilities, and challenges related to water resource management at household, community, and institutional levels. These consultations were guided by the principle that gender equality entails equal rights, opportunities, responsibilities, and outcomes for women and men across all spheres of society. Emphasis was placed on the empowerment of women through the identification of existing gender-based disparities, power imbalances, and barriers to participation in water governance. The findings from the FGDs informed the development of gender-responsive interventions aimed at enhancing women's agency, decision-making capacity, and equitable access to water resources and related benefits within the project areas.
The participatory Gender Assessment undertaken across the five target Gewogs of Thimphu Dzongkhag confirmed that women play a central role in household water management, agricultural production, and the maintenance of community water systems, yet remain significantly underrepresented in water governance and decision-making structures. The assessment identified important gender gaps in participation, leadership, access to training, technical skills, information, and control over productive resources, all of which influence women's adaptive capacity and resilience to climate-induced water stress. These findings informed the development of the project's Gender Action Plan (GAP)(Annex 2), which seeks to ensure that women and men benefit equitably from project investments and participate meaningfully in climate-resilient water governance and management.

- All Gewogs within the project area have established Water User Associations (WUAs) responsible for the oversight and management of drinking water and irrigation systems. However, women currently account for only about 11% of WUA office bearers, despite being among the primary users and managers of water at the household level. Most existing WUAs are informally recognized by Gewog administrations but are not formally registered and have limited capacity in water governance, administration, record keeping, conflict resolution, and financial management.

- The GAP therefore prioritizes the formal strengthening and registration of WUAs and promotes women's participation in leadership and decision-making roles. The project will support the development of gender-responsive WUA guidelines, by-laws, and management systems and will ensure that women comprise at least 30% of WUA executive positions by the end of the project. Community consultations, WUA establishment processes, and governance training will be designed to ensure inclusive participation, remove barriers to women's engagement, and promote women's leadership within local water institutions.

- The assessment revealed a significant disconnect between water users and water decision-makers. While women are primarily responsible for water collection, storage, cooking, cleaning, livestock watering, and kitchen gardens, decisions regarding water infrastructure planning, allocation, and management are largely made by men at community, Gewog, Dzongkhag, and sectoral levels. The assessment further found that men dominate local governance structures, including Dzongkhag and Gewog Tshogdes, limiting women's influence over water-related planning and investments.
- To address this imbalance, the GAP incorporates measures aimed at increasing women's participation in community decision-making forums, the Wangchhu River Basin Committee, Community Engagement Platforms (CEPs), WUAs, Local Government planning processes, and disaster

management committees. Training and mentorship support will be provided to strengthen women's leadership, public participation, advocacy, negotiation, and decision-making skills.

- The assessment highlighted that men generally undertake major repairs and construction activities related to water infrastructure, while women contribute substantially to routine operation and maintenance activities at both household and community levels. Yet women have had significantly fewer opportunities to access technical training, tools, technologies, and information related to water management. Approximately 90% of consultation participants reported that men enjoy better access to training opportunities than women.
- Given the strong women's role in managing water use and local infrastructure, the project will provide targeted technical capacity-building activities for women and men on:
    - ⋆ Water distribution and management;
    - ⋆ Efficient and economic use of water;
    - ⋆ Climate-resilient water technologies;
    - ⋆ Plumbing and minor repairs;
    - ⋆ Use of maintenance tools and equipment;
    - ⋆ Operation and maintenance of climate-resilient water infrastructure;
    - ⋆ Water governance and conflict resolution;
    - ⋆ Water source protection and watershed management.

- Training activities will be scheduled at times and locations accessible to women and will seek to achieve a minimum 30% participation rate by women, with higher participation encouraged wherever feasible. Gender-responsive learning approaches and female facilitators will be promoted where appropriate.

- The assessment found that women have lower access than men to climate information, training opportunities, agricultural technologies, irrigation technologies, and extension services. National evidence cited in the assessment indicates that awareness of climate-smart agriculture is substantially lower among women than men. Similar patterns were observed in the project area, where men reported greater access to information, technical skills, and agricultural inputs.
- The GAP therefore emphasizes targeted capacity development for women and girls on climate-resilient water management, sustainable agriculture, drought preparedness, climate-smart technologies, and ecosystem-based adaptation. Gender-responsive communication materials, awareness campaigns, and training events will be designed to reach women through channels and formats that are accessible and effective. Water security assessments, watershed management planning, drought preparedness frameworks, and climate information services will systematically incorporate sex-disaggregated data and gender-responsive indicators.

- The assessment identified persistent inequalities in access to productive resources. Men continue to dominate decision-making related to land ownership, irrigation of larger agricultural fields, and control over water-related productive assets. Women generally have less access to agricultural machinery, tools, transportation, extension services, and information. However, women maintain strong influence over household expenditures, savings, borrowing, and financial decision-making.
- Recognizing these dynamics, the project will promote women's participation in financial management training, bookkeeping, operation of WUAs, and management of community water systems. Climate-resilient agriculture interventions, irrigation technologies, and sustainable land management investments will prioritize equitable access for women and support labor-saving and gender-responsive technologies that reduce women's workloads while strengthening agricultural productivity and resilience.

The Gender Assessment therefore recommended:

- Increasing women's representation in WUA leadership from approximately 11% to at least 30%.
- Achieving a minimum of 30% women's participation in all community consultations, training workshops, committees, and decision-making structures.
- Supporting formal registration and strengthening of WUAs with gender-responsive governance arrangements.
- Integrating gender equality and social inclusion considerations into the Water Policy, Wangchhu River Basin Management Plan, Water Security Index System, Drought Preparedness and Response Plan, and all major project planning instruments.
- Providing targeted technical and leadership training for women in water governance, climate adaptation, infrastructure maintenance, financial management, and climate-smart agriculture.
- Establishing gender-responsive grievance and safeguarding mechanisms.
- Mainstreaming sex-disaggregated data collection, monitoring, and reporting throughout project implementation.
- Establishing effective accountability mechanisms to prevent exclusion, elite capture, unequal benefit-sharing, and gender-based risks; establish a gender-responsive Grievance Redress Mechanism (GRM) from project inception which will provide accessible, confidential, and transparent channels for women and men to raise concerns related to project implementation, water allocation, participation, benefit-sharing, Sexual Exploitation, Abuse and Harassment (SEAH), and other safeguards issues
- Recruiting a dedicated Environmental and Social Safeguards and Gender Expert to support implementation of the Gender Action Plan, monitor gender outcomes, strengthen institutional capacity, and ensure compliance with Adaptation Fund gender requirements and national gender policies.

Table 8 Summary of Stakeholder Consultations

SL.NO	Programme	Stakeholders	Date of Consultation	Outcome of Consultation
1	Project Concept Note and Project Formulation Grant Discussion	DMDF (Designated Authority), BTF (NIE), BES, Executing Entity representatives	27 May 2025	Reviewed Adaptation Fund approval of concept note and Project Formulation Grant; agreed to establish and strengthen the Technical Working Group, review governance arrangements, discuss PMU hosting, capacity building requirements, and accelerate full proposal preparation.
2	Strategic Consultation on Funding Prioritization and Institutional Arrangements	DMDF, BTF, BES, Thimphu Dzongkhag, Designated Authority representatives	30 May 2025	Reviewed overlaps with Government of India-funded activities; agreed to prioritize the Adaptation Fund LLA financing window; endorsed integrated water management interventions; proposed PMU arrangement and formation of TWG.

3	Stakeholder Consultation on TWG Formation and Proposal Development	DMDF, BTF, BES, DoW, DoFPS, DoID, DoA, DLGDM, DECC, NCHM, Thimphu Dzongkhag	7 July 2025	Stakeholders agreed to establish the Technical Working Group to support development of the full proposal, provide sectoral inputs, facilitate coordination and ensure agency participation.
4	First Technical Working Group Meeting	DMDF, BTF, BES, DoW, DoID, DoFPS, DoA, DLGDM, DECC, NCHM, Thimphu Dzongkhag	21 July 2025	Reviewed concept note, discussed governance arrangements, clarified roles and responsibilities, endorsed TWG Terms of Reference, agreed on stakeholder consultation processes, field validation and proposal formulation roadmap.
5	Project Planning and Technical Validation Workshop	Adaptation Fund, BTF, BES, Gups, GAOs, Engineers, Agriculture Sector, WSD/DoID, Irrigation Division	3 September 2025	Shared project objectives and implementation framework; validated proposed water investments; agreed on consultation schedule, technical assessments, water source verification and detailed survey plans.
6	Public Consultation – Genekha Gewog	Community members, Gup, Mangmi, Tshogpa, GAO, sector officials, Dzongkhag representatives	30–31 December 2025	Validated integrated water supply and irrigation project priorities; confirmed community support, availability of water sources and willingness to establish Water User Associations.
7	Public Consultation – Kawang Gewog	Community members, Gup, Mangmi, Tshogpa, GAO, sector officials, Dzongkhag representatives	1–2 January 2026	Reviewed Changtagang Water Supply Project; validated source suitability, community support and proposed implementation arrangements.
8	Public Consultation – Dagala Gewog	Community members, Gup, Mangmi, Tshogpa, GAO, sector officials, Dzongkhag representatives	5–6 January 2026	Validated Helela Water Supply Project; confirmed community willingness to contribute labor and participate in Water User Associations
9	Public Consultation – Mewang Gewog	Community members, Gup, Mangmi, GAO, Tshogpa, sector officials, Dzongkhag representatives	7–8 January 2026	Assessed Woluna, Khasadrapchu and irrigation interventions; validated water availability and community commitment for implementation support.
10	Public Consultation – Chang Gewog	Community members, Gup, Mangmi, GAO, sector officials, Dzongkhag representatives	9–10 January 2026	Reviewed Rama Water Supply Project and irrigation rehabilitation needs; confirmed local ownership and support for project implementation.

11	Second Technical Working Group Meeting	DMDF, BTF, BES, DoID, NCHM, DECC, DLGDM, Dzongkhag Administration and Gewog representatives	5–6 March 2026	Reviewed outcomes from public consultations and feasibility studies; finalized project activities, budget allocations and implementation priorities for inclusion in the full proposal
12	ESS, Gender Action Plan (GAP) and Indigenous Local Knowledge (ILK) Consultation – Genekha	WUA members; community men and women; Chizhi Gonpa representative; Gup; GAO; Mangmi, Tshogpas; BTF ESS experts; Gender experts; BES; Dzongkhag officials	13 July 2026	Conducted safeguards consultation, gender assessment and indigenous knowledge documentation; identified environmental and social risks; documented traditional water management practices; ensured participation of women and local institutions in adaptation planning.
13	ESS, GAP and ILK Consultation – Maedwang Irrigation Schemes	WUA members; 5 women and 5 men from Dalukha and Khasakha villages; local leaders; BTF ESS and Gender experts; BES	14 July 2026 (Morning)	Assessed safeguard issues associated with irrigation rehabilitation works; documented gender roles in irrigation management; identified vulnerable households and opportunities for equitable benefit sharing.
14	ESS, GAP and ILK Consultation – Khasadrapchu Water Supply Scheme	WUA members; women and men from business community; school representatives; local government officials; ESS and Gender experts	14 July 2026 (Afternoon)	Examined environmental and social impacts associated with drinking water investments, identified gender-specific water access constraints and documented local knowledge related to water governance.
15	ESS, GAP and ILK Consultation – Woluna and Danglo Water and Irrigation Systems	WUA members; 5 men and 5 women from Woluna and Danglo villages; monastery representatives; local leaders	15 July 2026 (Morning)	Conducted focus group discussions on safeguards, social inclusion and gender equality; documented indigenous knowledge on watershed protection and water resource management.
16	ESS, GAP and ILK Consultation – Rama Water Supply Scheme, Chang Gewog	WUA members; male and female community representatives; private sector representatives; Gup; GAO; ESS and Gender experts	15 July 2026 (Afternoon)	Identified social and environmental concerns, gender priorities, livelihood impacts and opportunities for inclusive participation in project implementation and Water User Associations.

17	ESS, GAP and ILK Consultation – Helela-Chamgang Water Supply Scheme, Dagala Gewog	Community residents; WUA members; women and men from five chiwogs; Gup,Mangmi, GAO, Mangmi, Tshogpa, BHU, RBP, Chamgang FMU representatives	16 July 2026	Assessed environmental and social safeguard requirements, gender-differentiated impacts of water scarcity, institutional inclusion needs, and traditional practices relevant to water management and climate adaptation.
18	ESS, GAP and ILK Consultation – Chhangdagang Water Supply Scheme, Kawang Gewog	WUA members; women and men from beneficiary villages; monastery representative; Gup; GAO; ESS and Gender experts	17 July 2026	Validated project beneficiaries, discussed safeguard measures, gender-responsive implementation approaches and documented local knowledge relevant to watershed protection and sustainable water use.
19	Household Surveys for ESS, Gender Baseline and Indigenous Knowledge Documentation	Vulnerable households, women-headed households, water users, community members in target gewogs	13–17 July 2026	Collected baseline data for Environmental and Social Management Plan (ESMP), Gender Action Plan (GAP) and Indigenous Local Knowledge documentation through household interviews conducted in parallel with stakeholder consultations.
20	Third Technical Working Group Consultation	DMDF, BTF, BES, DoW, DoFPS, DoID, DoA, DECC, NCHM, DLGDM, Thimphu Dzongkhag	20–22 July 2026	Finalize project activities, work plan, budget, governance arrangements (PSC, PMU, TAC) and stakeholder responsibilities for submission-ready proposal.

I. Provide justification for funding requested, focusing on the full cost of adaptation reasoning.

Bhutan is a land-locked country situated in the delicate mountainous terrain of the Eastern Himalayas. Owing to a combination of political, geographic, and social factors, Bhutan ranks as the 38th most vulnerable country and the 62nd most prepared country on the ND-GAIN Matrix.[93] This indicates that while Bhutan is on the path to effectively respond to climate change, its adaptation needs and the urgency to act are still significant. Various other international sources have also classified Bhutan as vulnerable to climate change.

Bhutan's economic size is relatively small, with a GDP of only USD 2.2 billion. The financial market is underdeveloped, and the country's access to global financial markets is limited due to its small economy. The COVID-19 pandemic has further exacerbated the situation, leading to a sharp decline

[93] https://gain-new.crc.nd.edu/country/bhutan

in domestic revenue, with further declines projected for the next two fiscal years (2022-23). The GDP growth has also significantly declined, reaching negative 10.08%, and the fiscal deficit is projected to be negative 8.59% of GDP in 2021-22. Bhutan's debt as a percentage of GDP has increased in recent years, from 114.2% in 2018-2019 to 138.8% in 2020-2021[94]. The limited government revenue hampers potential government investment, and Bhutan heavily relies on external grants, which are expected to decrease sharply due to front-loading. The export of hydroelectricity to India accounts for 20% of Bhutan's GDP and has played a significant role in its economic achievements. However, around 77% of Bhutan's external debt is associated with hydropower projects, raising concerns about the sustainability of these projects.[95]

Being a small country with a small market and population, Bhutan faces challenges in accessing various sources of finance, particularly private sector finance, due to perceived high risks for private investments. The government's budget for addressing climate change and energy-related challenges is limited, and the country's financial markets are not mature enough to attract significant private investments. While Bhutan prioritizes climate efforts and progresses, it faces constraints in terms of cost and technology. Funding for softer climate change programs involving capacity building, institutional strengthening, and technical assistance for policy or strategy development is more accessible. However, securing adequate financial support for the implementation of these programs, policies, and strategies remains a serious challenge.

In this context, the AF-LLA grant can play a crucial role in addressing these challenges and facilitating further investments in climate change adaptation.

The results and outputs of the project are closely aligned with the Adaptation Fund's results framework, contributing directly to the overarching objectives and outcomes specified in the Adaptation Fund's Strategic Results Framework. Specifically, project outcomes 1, 2, and 3 correspond with outcomes 3, 4, and 5 of the Adaptation Fund, and these alignments have been detailed in the project component descriptions. Project Outcome 1: The enhancement of ecosystem resilience in response to climate change and variability-induced stress corresponds with AF Outcome 5: Increased ecosystem resilience in response to climate change and variability-induced stress. Ensured access to irrigation and reliable drinking water aligns with AF Outcome 4: Increased adaptive capacity within relevant development sector services and infrastructure assets. The increased resilience of local communities to climate change, achieved through improved capacity in adaptation planning and implementation, aligns with AF Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at the local level.

J. Describe how the sustainability of the project/programme outcomes has been taken into account when designing the project / programme. In particular, describe how the project/programme supports long-term development of local governance processes, and improves the capacity of local institutions (including through simpler access modalities), and how it can ensure that communities can effectively implement adaptation actions, facilitate and manage adaptation initiatives over the long term without being dependent on project-based donor funding.

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[94] *Bhutan - Country Partnership Framework for the Period FY2021-24 (English).* Washington, D.C.: World Bank Group. http://documents.worldbank.org/curated/en/620541608337280651/Bhutan-Country-Partnership-Framework-for-the-Period-FY2021-24

[95] Namgyel, T, Gebreyes, BY and Tenzing, J (2018) From global ambition to country action: Bhutan steps towards low carbon climate resilient development. IIED, London. http://pubs.iied.org/10195IIED.

The long-term sustainability of project outcomes will be ensured based on the following:

The project activities will be integrated into existing systems by aligning the activities with the 13th Five-Year Plan (FYP) objectives and the Water Flagship Programme. Additionally, in accordance with the Water Act of Bhutan 2011, the formation/strengthening of Water User Associations (WUAs) is proposed as part of the project to ensure the sustainability of the scheme. After project finalization, the operation and maintenance aspects of the scheme will be integrated into local government plans, thus institutionalizing the WUAs' role.

Different collaborating agencies from the national level, local governments and CSOs are responsible for managing various project components as they possess qualified and capable human resources for executing the tasks. These agencies have robust governance and financial systems in place, and thorough due diligence will be exercised to manage the project effectively.

RGoB Commitment and Ownership: The Ministry of Energy, Environment and Natural Resources (MoENR) is the Competent Authority for irrigation, watershed, and wetland management and the Ministry of Infrastructure and Transport for the water supply schemes through providing technical backstopping such as designs and cost estimation. The Department of Forests and Park Services (DoFPS) collaborates with stakeholders to categorize and develop management plans for watersheds and spearheads formation of the Community based Forest Fire Management Groups. Similarly, the Ministry of Energy, Environment and Natural Resources (MoENR) and Ministry of Infrastructure and Transport oversees the planning and management of drinking water supply and wastewater infrastructure in coordination with local governments. Both ministries are mandated to secure adequate budgets for the maintenance and recurring costs of irrigation and drinking water supply schemes including technical backstopping in design and costing.
The relevant line Ministries and Departments were involved as members of the Task Force in the formulation of the concept and identified as the Executing Entities. Thus, all these agencies are responsible for providing necessary policy, financial and technical support. To ensure responsibilities and sustainability, provisions will be included in the Subsidiary Agreement of the project that will be signed between the NIE and the Royal Government.
Further, the current Water User Associations (WUAs) operate under local bylaws that have been developed in collaboration with community members and subsequently approved by the Gewog. These bylaws are designed to promote sustainability by enhancing the capacity of water users to manage and maintain resources, which is facilitated through the collection of minimal fees from community members. Furthermore, annual budgeting will be secured upon request from local communities through the Ministry of Energy and Natural Resources and the Ministry of Finance in accordance with the national budgeting framework of the country

Institutional Sustainability: The project's institutional arrangements are built upon existing RGoB systems, program management, fund flow, accounting, and reporting. It supports the strengthening of capacities and organizational structures within MoENR and MoIT to ensure the resilient ecosystems and uninterrupted supply of drinking and irrigation water.

Participatory Action Planning and Community Ownership: The project encourages participatory village-level action planning and implementation through farmers' groups and community involvement to foster ownership of project interventions. Capacity development investments ensure the achievement of project results and sustainability beyond the implementation period.

Extension and Technical Support Services: The Divisional Forest Offices and Regional agriculture research and development centers (ARDCs) and local governments provide extension and technical support services, promoting responsiveness to farmers' needs and increased accountability. The project enhances the capacity of relevant officials, enhancing in-house expertise.

Research institutions such as the National Soil Service Center (NSSC), Agriculture Research Development Center (ARDC) and Ugyen Wangchuck Institute for Forestry Research and Training (UWIFoRT) possess extensive knowledge and expertise in areas including sustainable land management, ecosystem restoration, sustainable water resource management, and the design of irrigation systems. To ensure the effective implementation of Ecosystem-based Adaptation (EbA) interventions and sustainable water resource management, these institutions will be consulted for their technical expertise. The field office of the Department of Forests and Park Services and the Department of Water will primarily facilitate activities related to watershed and spring-shed management, as well as the restoration of degraded watersheds. In instances where restoration involves planting, the Forest Offices will offer technical guidance and recommend suitable species for planting.

Financial Sustainability: Infrastructure development and maintenance, including eco-restoration and EbA & SLM initiatives, will be mainstreamed into central and local government plans and programs. The RGoB allocates budgets annually to agencies involved in eco-restoration and SLM activities, ensuring post-project sustainability and scalability. Many communities in Bhutan are experiencing comparable challenges regarding the availability of water resources. Bhutan's National Adaptation Plan 2023 places significant emphasis on water management as a key priority. Most adaptation initiatives will focus on the conservation of drinking water sources, the improvement of water supply systems, and the enhancement of irrigation facilities. Given the successful execution of these initiatives and the resulting economic and social advantages in the targeted communities, there is potential for these strategies to be effectively expanded to other areas.

Community based WUA Engagement: After project completion, the WUAs will take on the responsibility of the operation and minor maintenance activities, while major maintenance beyond their capacity will be supported by local governments through inclusion in the annual budgeting. Relevant agencies will continue to provide technical support to the WUAs.

According to the Local Government Act of Bhutan 2009, a portion of the national revenue is designated for Local Governments to promote self-sufficiency and sustainability. Consequently, Local Governments are granted annual funding from the Royal Government to implement planned programs, activities, and to oversee the management and maintenance of existing service infrastructures and service delivery. At both the Gewog and Dzongkhag levels, Local Governments possess the authority to allocate budgets for priority initiatives that enhance community welfare. For minor upgrades and repairs at the community level, Water User Associations (WUAs) operate independently, managing day-to-day activities related to drinking water and irrigation supply within the community. These WUAs maintain a joint bank account where funds generated from member fees and any contributions from households are collected and managed. The WUA management committee is empowered to utilize these funds for minor maintenance and improvements. Additionally, based on a majority decision among members, a portion of the budget may also be allocated for community rituals and other activities that benefit the community.

To strengthen the capabilities of local communities, selected members of the Gewogs will undergo training in financial management, aimed at promoting sustainability and effective resource allocation.

Similarly, training on project management and financial management is proposed for the local leaders, WUAs and other local institutions.

The Local Government Act of 2009 grants authority to the Gewog Development Committees (Local Committees) to establish and enforce regulations aimed at safeguarding the health, safety, and well-being of Gewog residents. These committees are responsible for managing and distributing safe, clean drinking water from water supply systems, as well as overseeing the allocation of irrigation water in compliance with applicable laws.

To advance sustainable water management, Bhutan has implemented the National Integrated Water Resource Management Plan 2016. This plan guides activities related to sustainable water resource management at both national and local levels. Various sectors are also engaged in promoting strategies for sustainable water management, such as drip irrigation within climate-smart agriculture, optimizing irrigation systems, and reducing water waste. Component 3 includes capacity-building initiatives for climate-smart agriculture and

water resource management, along with specific modules focused on sustainable water resource management, irrigation system optimization, and strategies to minimize water wastage.
By implementing the project on these sustainable bases, it aims to secure the long-term success and effectiveness of the interventions even after the project phases out.

K. Provide an overview of the environmental and social impacts and risks identified as being relevant to the project / programme.

Following the provisional risk identification through consultation with relevant national and local stakeholders through screening of the project risk by each output that are relevant to 15 AF ESS principle, project risk category has been determined as Category B since the likelihood of risks is Moderate. The likely impact from such risks are minor, site specific and manageable. Environment, social and provisional risk categorization included in the revised concept note.

Checklist of environmental and social principles	**No further assessment required for compliance**	**Potential impacts and risks – further assessment and management required for compliance**
Compliance with the Law		Moderate Risk (Category B) Need further assessment.
Access and Equity		Moderate Risk (Category B). Need further assessment on equitable sharing of project benefits.
Marginalized and Vulnerable Groups		Moderate Risk (Category B). Need further assessment on participation of women in local governance and community user groups and gender differentiated roles in the target communities.
Human Rights		Moderate Risk (Category B)
Gender Equality and Women's Empowerment		Moderate Risk (Category B). Need further assessment on ensuring women participation in project activities.
Core Labour Rights		Moderate Risk (Category B). Need further assessment on ensuring compliance to labour rights.
Indigenous Peoples	✓	
Involuntary Resettlement		Moderate Risk (Category B) : Need further assessment to ensure that as a result of infrastructure construction or clearing of way farmers cultivated land and their settlement is not impacted
Protection of Natural Habitats		Moderate Risk (Category B). Need further assessment to ensure that invasive alien species are not planted, and only native species of plants are used for plantation.
Conservation of Biological Diversity		Moderate Risk (Category B) : Need further assessment to ensure e-flow in streams.
Climate Change		Moderate Risk (Category B). Need assessment to ensure climate smart design and infrastructure.

Pollution Prevention and Resource Efficiency		Moderate Risk (Category B). Need assessment to ensure compliance to provisions of the environmental clearance.
Public Health		Moderate Risk (Category B). Need assessment to ensure adherence to occupational health and safety standards.
Physical and Cultural Heritage	✓	
Lands and Soil Conservation		Moderate Risk (Category B). Need assessment to restore any exposed soil and prevent water pipe leakages due to project activities.

The proposal includes several sub-projects for which specific Ecosystem-based Adaptation (EbA) interventions have yet to be finalized after the detailed watershed assessments of targeted water sources are conducted in the first year. Potential measures include check dams, spring and water source protection, watershed trenching, and plantation restoration. The selection, design, and location of interventions will be determined through detailed watershed assessments during the first six months of implementation and will comply with national Sustainable Land Management (SLM) and Watershed Management Guidelines. Following confirmation of interventions, the Environmental and Social Management Plan (ESMP) will be updated to incorporate site-specific risks and mitigation measures.

An ESMP has been prepared (Annex 3) in accordance with Adaptation Fund requirements. It provides a framework for identifying, monitoring, reporting, and managing environmental and social risks, including any new risks that may emerge during project implementation.

A comprehensive Gender Assessment (Annex 2) has been conducted in line with the Adaptation Fund Gender Policy, and its findings have informed project design to ensure gender-responsive implementation. Gender analyses will continue throughout implementation to further strengthen gender equality outcomes and enhance the climate resilience of both women and men.

An Environmental and Social Safeguards and Gender Specialist will oversee compliance with the Adaptation Fund's 15 Environmental and Social Policy Principles and update the ESMP as required during the initial six months of implementation. The Project Management Unit (PMU) will secure all necessary approvals and clearances from relevant authorities before the commencement of site-specific activities.

PART III: IMPLEMENTATION ARRANGEMENT

A. Describe the arrangements for project / programme implementation. Please describe how the implementation modalities enable giving local institutions and communities more direct access to finance and decision-making power over how adaptation actions are defined, prioritized, designed and implemented.

The **Department of Macro-Fiscal and Development Finance (DMDF), Ministry of Finance**, acting as the Designated Authority (DA) to the Adaptation Fund, shall provide overall strategic guidance, policy oversight, and coordination to ensure that project interventions are fully aligned with Bhutan's national development priorities, the 13th Five-Year Plan, the National Adaptation Plan (NAP), and the principles of Locally Led Adaptation (LLA).

The **Bhutan Trust Fund for Environmental Conservation (BTFEC)**, acting as the National Implementing Entity (NIE), shall be responsible for overall project oversight, fiduciary management, environmental and social safeguards compliance, monitoring, reporting, and liaison with the Adaptation Fund Secretariat. The NIE will ensure that project implementation complies with the Adaptation Fund's Environmental and Social Policy, Gender Policy, fiduciary standards, and approved project results framework.

A **Project Steering Committee (PSC)** shall be established as the highest decision-making and oversight body of the project. The PSC shall provide strategic technical, policy, and financial guidance, approve annual work plans and budgets, monitor overall project performance, facilitate inter-agency coordination, and support adaptive management throughout project implementation.

A **Technical Advisory Committee (TAC)** will be established to provide strategic guidance, technical oversight, and quality assurance for project implementation. The Committee will comprise representatives from Thimphu Dzongkhag, including the District Engineer (DE) and District Planning Officer (DPO); the Bhutan Trust Fund for Environmental Conservation (BTFEC); the Department of Water (DoW), Ministry of Energy and Natural Resources (MoENR); the Department of Local Governance and Disaster Management (DLGDM), Ministry of Home Affairs (MoHA); the Department of Forests and Park Services (DoFPS), MoENR; the Department of Agriculture (DoA), Ministry of Agriculture and Livestock (MoAL); the Department of Infrastructure Development (DoID), Ministry of Infrastructure and Transport (MoIT), represented by the Irrigation Division and Water and Sanitation Division (WSD); and Administrative Officers from the five target Gewogs.

The TAC will review annual work plans and technical designs, provide expert advice on water resources management, watershed conservation, agriculture, forestry, irrigation, and local governance, ensure alignment with national policies and sector strategies, facilitate cross-sectoral coordination among stakeholders, monitor implementation progress, identify and address technical challenges, and provide recommendations to enhance project effectiveness, sustainability, and climate resilience outcomes at both district and community levels.

The **Project Management Unit (PMU)** shall be housed within the Thimphu Dzongkhag, in line with the principles of locally led adaptation and community-centered implementation. The PMU shall coordinate the implementation of all project components, facilitate collaboration among executing entities, local governments, Water User Associations (WUAs), community groups, and beneficiaries, and ensure timely implementation, reporting, and compliance with project requirements.
The project will be implemented through close collaboration between National Agencies, Thimphu Dzongkhag Administration, Gewog Administrations, Water User Associations, local adaptation committees, and community institutions. Local governments and community organizations will play a central role in identifying

priorities, validating interventions, participating in implementation, monitoring progress, and ensuring long-term sustainability of project investments.

Executing Entities and Component Responsibilities

Project Component	Executing Entity	Parent Organization
Component 1: Ecosystem-Based Adaptation (EbA), Watershed Restoration and Forest Fire Risk Management	Department of Forests and Park Services (DoFPS)	Ministry of Energy and Natural Resources (MoENR)
	Department of Water (DoW)	Ministry of Energy and Natural Resources (MoENR)
	Department of Agriculture (DoA)	Ministry of Agriculture and Livestock (MoAL)
Component 2: Community-Based Climate-Resilient Drinking Water and Irrigation Infrastructure	Department of Infrastructure Development (DoID)	Ministry of Infrastructure and Transport (MoIT)
	Thimphu Dzongkhag Administration	Local Government
Component 3: Capacity Building, Water Governance and Local Adaptation Planning	Department of Local Governance and Disaster Management (DLGDM)	Ministry of Home Affairs (MoHA)
	Department of Water (DoW)	Ministry of Energy and Natural Resources (MoENR)
	Thimphu Dzongkhag Administration	Local Government
Project Coordination and Knowledge Management	Thimphu Dzongkhag	Local Government

The Project Implementation arrangement is as illustrated in Figure 13 below:

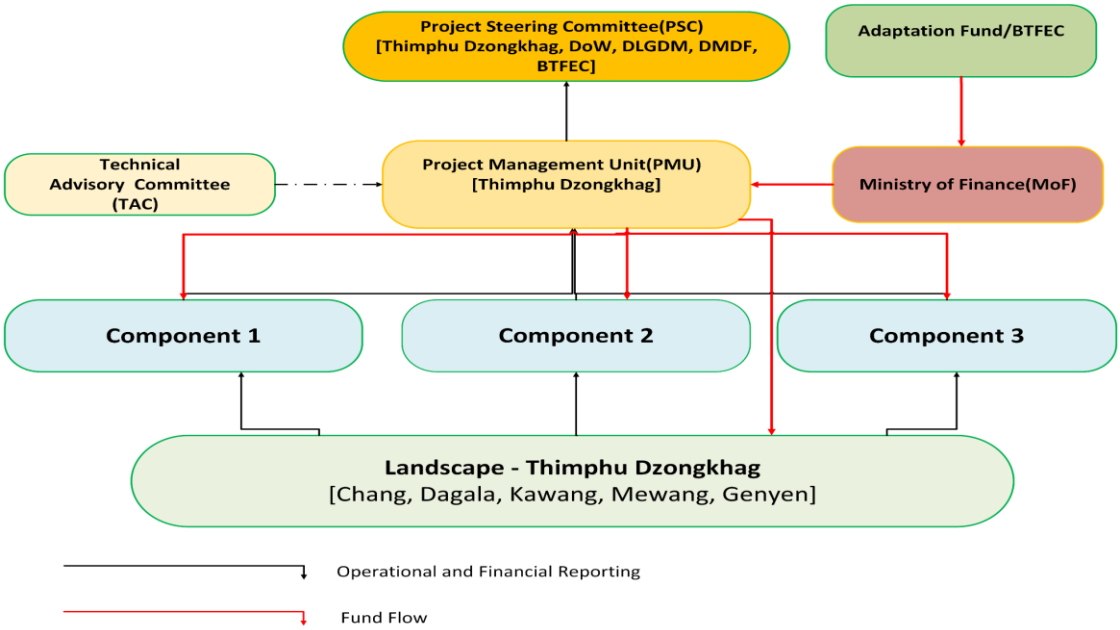


Figure 13 Project Governance & Implementation arrangement

Fund Flow Mechanism

Once the project is approved, based on the agreed disbursement schedule, the funds shall be transferred to the NIE's bank account maintained with Bhutan National Bank Limited, Thimphu Main Branch, via Royal Monetary Authority of Bhutan. Upon ensuring proper budget incorporation by respective implementing entities, the NIE shall disburse the fund to the Department of Treasury and Accounts (DTA), Ministry of Finance, Thimphu, Bhutan. The DTA, after fulfilling all the requirements, shall disburse the fund to the respective executing entities.

Periodic Progress Reporting

The Project Management Unit (PMU) shall establish and maintain a comprehensive reporting system to monitor the progress, performance, compliance, and results of the project. All Executing Entities shall prepare and submit periodic technical, financial, safeguards, gender, and monitoring reports using reporting formats prescribed by the National Implementing Entity (NIE).

Executing Entities shall submit semi-annual and annual progress reports to the PMU covering implementation progress, financial expenditure, procurement status, environmental and social safeguards compliance, gender action plan implementation, challenges encountered, lessons learned, and planned actions for the subsequent reporting period. The PMU shall review and consolidate these reports into project-wide progress reports for submission to the Project Steering Committee (PSC), the Designated Authority (DA), and the National Implementing Entity (NIE).

The Bhutan Trust Fund for Environmental Conservation (BTFEC), in its capacity as the National Implementing Entity (NIE), shall prepare and submit all required reports to the Adaptation Fund Secretariat in accordance with the Adaptation Fund reporting requirements, fiduciary standards, Environmental and Social Policy, Gender Policy, and Results Framework. Submission of reports to the Adaptation Fund

Secretariat shall be undertaken in consultation with, and with the endorsement of, the Department of Macro-Fiscal and Development Finance (DMDF) in its role as the Designated Authority (DA).

Overall reporting oversight and quality assurance shall be provided jointly by the Department of Macro-Fiscal and Development Finance (DMDF) and the Department of Public Budget and Planning (DPBP), Ministry of Finance, to ensure alignment with national planning priorities, public financial management requirements, and Adaptation Fund reporting standards. Regular review meetings shall be conducted to assess implementation progress, address bottlenecks, and facilitate adaptive management throughout the project lifecycle.

The Grant Agreement and any Subsidiary Agreements executed between BTFEC, DMDF, and the respective Executing Entities shall clearly define reporting obligations, timelines, fiduciary requirements, safeguards compliance provisions, audit requirements, monitoring and evaluation responsibilities, and performance management arrangements. These agreements shall ensure that all implementing partners comply with national regulations as well as the reporting, fiduciary, environmental, social, and gender requirements of the Adaptation Fund.

Reporting Schedule

Report Type	Prepared By	Submitted To	Frequency
Technical Progress Report	Executing Entities	PMU	Semi-Annual
Financial Progress Report	Executing Entities	PMU	Semi-Annual
Environmental & Social Safeguards Report	Executing Entities / PMU	NIE	Semi-Annual
Gender Action Plan Progress Report	PMU	NIE	Semi-Annual
Consolidated Project Progress Report	PMU	PSC, DMDF & NIE	Semi-Annual
Annual Project Performance Report	PMU / NIE	PSC, DMDF & Adaptation Fund Secretariat	Annual
Mid-Term Review Report	Independent Reviewer / PMU	PSC, NIE & Adaptation Fund Secretariat	Mid-Term
Project Completion Report	PMU / NIE	DMDF & Adaptation Fund Secretariat	End of Project
Terminal Evaluation Report	Independent Evaluator	NIE & Adaptation Fund Secretariat	Project Closure

Stakeholder Engagement Plans

Component 1: Ecosystem-Based Adaptation (EbA) and Watershed Restoration

	Stakeholder	Type	Role in Project
Output 1.1 Water Resource Management and Governance Strengthened	Department of Water (DoW)	Government Agency	Lead agency for integrated water resource management planning, hydrological mapping, hydro-met station establishment, climate-proofing guidelines, and development of centralized water information systems.
	Department of Forests and Park Services (DoFPS)	Government Agency	Technical guidance for watershed protection and catchment management.
	National Centre for Hydrology and Meteorology (NCHM)	Government Agency	Hydro-meteorological data, technical support for weather stations and climate information services.
	Thimphu Dzongkhag Administration	Local Government	Facilitate planning processes and integration into district development plans.
	Gewog Administrations	Local Government	Mobilize communities, host consultations and coordinate local implementation.
	Water User Associations (WUA	Community Institution	Participate in water governance planning, local monitoring, and data collection.
	Local Adaptation Committees	Community Institution	Validate adaptation priorities and oversee local monitoring systems.
	Women and Youth Representatives	Vulnerable Groups	Participate in planning and local decision-making.
Output 1.2 EbA and SLM Interventions Implemented	DoFPS	Government Agency	Lead implementation of ecosystem restoration, plantation establishment, spring-shed revival, habitat enrichment and watershed rehabilitation.
	Department of Agriculture (DoA)	Government Agency	Technical support on sustainable land management and climate-smart agriculture.
	Department of Water	Government Agency	Hydrological and watershed technical assessment.

	Dzongkhag and Gewog Administrations	Local Government	Community mobilization and field-level implementation coordination.
	Farmers Groups	Community Group	Participate in restoration, SLM implementation and monitoring.
	Community Forest Groups	Community Institution	Protection and maintenance of restored watershed areas.
	Women Farmers Groups	Beneficiary Group	Implementation of SLM and livelihood-related interventions.
	Local Communities	Beneficiaries	Participate in planning, labor contribution, traditional knowledge documentation and monitoring.
Output 1.3 Integrated forest fire management systems established to reduce climate-induced forest fire risks	DoFPS	Government Agency	Lead forest fire management planning and implementation.
	Inter-Agency Forest Fire Coordinating Groups (IFFCG)	Multi-sector Platform	Coordination during fire prevention and response.
	Gewog Forest Fire Coordinating Groups (GFFCG)	Community Institution	Community-based fire management and preparedness.
	Dzongkhag Administration	Local Government	Coordination and emergency response support.
	Schools and Monasteries	Community Institution	Awareness creation and community mobilization.
	Local Communities	Beneficiaries	Fire surveillance, prevention and suppression activities.
	Youth Groups	Community Volunteers	Awareness campaigns and rapid response activities.

Component 2: Community-Based Climate-Resilient Water Infrastructure

	Stakeholder	**Type**	**Role in Project**
Output 2.1 Community-Based Climate-Resilient Drinking Water Infrastructure Established	Department of Infrastructure Development (DoID)	Government Agency	Engineering design, procurement support, technical supervision and quality assurance.
	Department of Water	Government Agency	Water source assessment and resource management guidance.

	Thimphu Dzongkhag Engineering Sector	Local Government	Site supervision and implementation support.
	Gewog Administrations	Local Government	Community engagement and implementation coordination.
	Water User Associations	Community Institution	Participation in design validation and operation & maintenance planning.
	Beneficiary Households	Beneficiaries	Participate in site selection, design validation, monitoring and O&M.
	Women Representatives	Community Group	Ensure gender-responsive water services and equitable access.
	Contractors and Suppliers	Private Sector	Infrastructure construction and supply of materials.
Output 2.2 Community-Based Climate-Resilient Irrigation Infrastructure Established and Improved	Department of Water	Government Agency	Irrigation planning and water resource allocation.
	Department of Agriculture	Government Agency	Agricultural support services and irrigation management guidance.
	Department of Infrastructure Development	Government Agency	Engineering support and quality control.
	Thimphu Dzongkhag Engineering Sector	Government Agency	Engineering design, procurement support, technical supervision and quality assurance
	Gewog Administrations	Local Government	Mobilization of farmer participation.
	Beneficiary households	Beneficiaries	Participate in site selection, design validation, monitoring and O&M.
	Contractors and Suppliers	Private Sector	Infrastructure construction and supply of materials.

Component 3: Capacity of Communities and Institutions on Adaptation Planning and Water Resource Management Enhanced

	Stakeholder	Type	Role in Project
Output 3.1 Water User Associations Strengthened and Formalized for Effective Management of Drinking Water and Irrigation Systems	Department of Water (DoW)	Government Agency	Lead agency for WUA strengthening, formal registration, institutional development, preparation of governance guidelines, and technical oversight of WUA performance.
	Department of Local Governance and Disaster Management (DLGDM)	Government Agency	Provide guidance on local governance systems and institutional strengthening.
	Thimphu Dzongkhag Administration	Local Government	Coordinate WUA strengthening activities, facilitate inter-Gewog learning and support local monitoring.
	Gewog Administrations	Local Government	Facilitate WUA formation, registration, by-law review, community consultations and grievance management.
	Existing WUAs	Community Institutions	Participate in governance assessments, review of bylaws and strengthening activities.
	Newly Formed WUAs	Community Institutions	Participate in establishment processes, governance training and registration.
	WUA Executive Committees	Community Institution	Participate in specialized training on leadership, financial management, procurement, conflict resolution and water governance.
	Women Representatives	Community Group	Ensure women's representation in WUA governance and leadership positions.
	Youth Representatives	Community Group	Participate in governance and future leadership development.
	Beneficiary Households	Communities	Participate in WUA meetings, elections and governance decisions.
Output 3.2 Capacity of Local Communities, Local Leaders and Organizations	DLGDM	Government Agency	Lead implementation of capacity-building programmes and facilitation of locally led adaptation processes
	Department of Water	Government Agency	Technical training on integrated water resource management and water governance.

Enhanced for Adaptation Planning and Implementation	DoFPS	Government Agency	Capacity building on ecosystem restoration, forest fire management and watershed management.
	Department of Agriculture	Government Agency	Training on climate-smart agriculture and sustainable land management.
	Thimphu Dzongkhag Administration	Local Government	Coordination and participation in adaptation planning processes.
	Gewog Administrations	Local Government	Facilitate community participation and local training programmes.
	Local Leaders (Gups, Mangmis, Tshogpas)	Local Government	Participate in leadership development and adaptation planning.
	Women Leaders	Community Group	Participate in leadership, governance and adaptation decision-making training.
	Youth Leaders	Community Group	Participate in climate leadership development and adaptation innovation.
	Local Adaptation Committees	Community Institution	Facilitate adaptation planning, prioritization and monitoring.
	Community-Based Organizations	Community Institution	Support local adaptation implementation and awareness programmes.
	Vulnerable Households	Beneficiaries	Participate in adaptation planning consultations and targeted capacity-building activities.
Output 3.3 Project Results and Lessons Learned Disseminated	Bhutan Trust Fund for Environmental Conservation (BTFEC)	National Implementing Entity	Dissemination of lessons learned at national level and Adaptation Fund reporting.
	Department of Macro-Fiscal and Development Finance (DMDF)	Designated Authority	Policy-level knowledge uptake and integration into national adaptation processes.

	Executing Agencies	Government Agencies	Documentation of technical lessons and dissemination of sectoral knowledge.
	Thimphu Dzongkhag Administration	Local Government	Facilitate local knowledge-sharing events and learning exchanges.
	Water User Associations	Community Institution	Share local experiences and adaptation lessons.
	Community Leaders	Beneficiaries	Share adaptation success stories and indigenous knowledge.
	Research Institutions	Knowledge Partner	Research, documentation and technical publications.
	Universities and Training Institutes	Knowledge Partner	Support learning products and curriculum integration.
	Media Organizations	Communication Partner	Public awareness and dissemination.
	Local Communities	Beneficiaries	Participate in learning exchanges and dissemination events.
	Research Institutions	Knowledge Partner	Research, documentation and technical publications.
	Universities and Training Institutes	Knowledge Partner	Support learning products and curriculum integration.

B. Describe the measures for financial and project / programme risk management. Please describe how local stakeholders contribute to the design and management project risk management.

The Bhutan Trust Fund for Environmental Conservation (BTFEC), as the National Implementing Entity (NIE), has extensive experience in managing and overseeing nationally and internationally funded projects, including those financed by the Global Environment Facility (GEF), World Bank, Climate Investment Funds (CIF), the Green Climate Fund (GCF), and the Adaptation Fund. BTFEC has established fiduciary systems, operational procedures, and risk management frameworks that are consistent with international best practices and the fiduciary standards of the Adaptation Fund.
The implementation of this project will therefore be guided by BTFEC's Programme Operational Norms (PONs), Risk Management Policy, Environmental and Social Management Framework (ESMF), and applicable fiduciary and safeguard procedures.

Risk management will be integrated throughout the project cycle, from project design and implementation to monitoring, reporting, evaluation, and closure.
In line with the principles of Locally Led Adaptation (LLA), risk management will not be limited to institutional oversight but will actively involve local governments, Water User Associations (WUAs), community representatives, women, youth groups, and other project beneficiaries in identifying, assessing, monitoring, and managing risks.

During project inception and implementation, all activities will undergo systematic screening to identify potential financial, technical, environmental, social, institutional, fiduciary, procurement, operational, governance, climate, and sustainability risks. Risks identified through consultations, feasibility assessments, safeguard assessments, and implementation monitoring will be documented in a Project Risk Register. For each identified risk, an appropriate mitigation and monitoring plan will be developed, including responsibilities, timelines, monitoring indicators, and reporting requirements.

The Environmental and Social Management Plan (ESMP), Gender Action Plan (GAP), and Grievance Redress Mechanism (GRM) will form integral components of the overall project risk management framework.

Role of the National Implementing Entity (NIE)
The NIE will provide overall oversight and quality assurance of project risk management and shall:

- Promote a culture of proactive risk management, accountability, transparency, and continuous learning.
- Ensure that risk management is integrated into all project planning, implementation, procurement, financial management, monitoring, and reporting processes.
- Regularly identify, assess, monitor, and review project risks and mitigation measures.
- Maintain and periodically update the Project Risk Register and associated mitigation plans.
- Ensure that fiduciary, environmental, social, and gender risks are managed in accordance with Adaptation Fund standards.
- Monitor compliance with grant agreements, procurement procedures, financial management requirements, and environmental and social safeguards.
- Support adaptive management by responding to emerging risks and changing implementation conditions.

Governance and Audit Oversight
BTFEC's Governance and Audit Committee will provide independent oversight of internal controls, fiduciary accountability, and risk management systems. The Committee will periodically review project risks, mitigation actions, audit findings, compliance reports, and internal control mechanisms to ensure that risks

are effectively managed and remain within acceptable levels. Recommendations arising from internal and external audits will be incorporated into project management and implementation processes.

Role of the Project Management Unit (PMU)

The Project Management Unit (PMU), hosted by the Thimphu Dzongkhag, will be responsible for coordinating day-to-day risk management activities. The PMU will:

- Facilitate risk identification and assessment at project and community levels.
- Maintain and regularly update the Project Risk Register.
- Consolidate risk information from Executing Entities and communities.
- Monitor implementation of mitigation measures.
- Report emerging risks and corrective actions to the Project Steering Committee (PSC) and NIE.
- Coordinate implementation of the ESMP, GAP, stakeholder engagement activities, and grievance mechanisms.
- Ensure that lessons learned from implementation are incorporated into adaptive management and decision-making.
- Coordinate half yearly and Annual Progress review consultation with stakeholders
- Coordinate timely implementation and executing of projects reflected in annual work plans (AWPs) submitted by Executing Entities

Role of Executing Entities

The Executing Entities shall be responsible for risk management within their respective components and activities. Specifically, they shall:

- Identify and manage technical, operational, fiduciary, and safeguard risks associated with their activities.
- Ensure compliance with approved technical standards, procurement procedures, environmental clearances, and social safeguards.
- Report risks, incidents, and mitigation measures to the PMU on a regular basis.
- Participate in project risk reviews and monitoring missions.
- Support local institutions and communities in implementing risk mitigation measures.

Internal and External Audit

The Internal Auditor of BTFEC will provide independent assurance regarding the effectiveness of project governance, fiduciary controls, internal control systems, and risk management processes. Internal audit findings will be used to strengthen financial accountability, improve project implementation, and enhance institutional learning.

External audit oversight will be provided by the Royal Audit Authority (RAA), the Supreme Audit Institution of Bhutan, in accordance with Article 25 of the Constitution of the Kingdom of Bhutan and the Audit Act of Bhutan. The RAA will independently assess the economy, efficiency, effectiveness, and accountability of project expenditures and review the adequacy of financial management and risk management systems. Findings and recommendations from external audits will be used to strengthen project governance and mitigate emerging risks.

Contribution of Local Stakeholders to Risk Management

Consistent with the principles of Locally Led Adaptation, local stakeholders will play a central role in identifying, assessing, monitoring, and managing project risks. Risk management will not be solely driven by national institutions but will be embedded within community-level governance and decision-making structures.

Community-Based Risk Identification

During project planning and implementation, communities, Water User Associations (WUAs), Local Adaptation Committees, women leaders, youth representatives, and local government officials will

participate in risk identification workshops and participatory planning exercises. These consultations will help identify location-specific risks related to:

- Water scarcity and source degradation;
- Climate and weather extremes;
- Forest fire risks;
- Infrastructure sustainability and maintenance;
- Environmental and social impacts;
- Access and equity concerns;
- Gender and inclusion risks;
- Community conflicts or resource-use disputes;
- Institutional and governance challenges.

Local knowledge and traditional ecological knowledge will be incorporated into risk assessments to improve the accuracy and relevance of risk management measures.

Community Monitoring and Adaptive Management

Community-based monitoring systems will be established to support ongoing risk monitoring throughout project implementation. Water User Associations, Local Adaptation Committees, Gewog Administrations, and community monitoring teams will regularly monitor:

- Functionality of drinking water and irrigation infrastructure;
- Watershed restoration performance;
- Environmental and social safeguard compliance;
- Emerging climate-related hazards;
- Gender and inclusion outcomes;
- Community feedback and grievances.

Findings from community monitoring will be communicated to the PMU and Executing Entities and incorporated into project decision-making and adaptive management processes.

Grievance and Early Warning Mechanisms

Local stakeholders will contribute to risk management through accessible grievance and feedback mechanisms. Communities will be able to report concerns related to project implementation, environmental impacts, social issues, governance challenges, or misuse of resources through WUAs, Gewog Administrations, Local Adaptation Committees, community meetings, and the project grievance mechanism.

Capacity Building for Risk Management

To strengthen local ownership of adaptation interventions, the project will provide targeted training to WUAs, community leaders, Gewog officials, women representatives, and youth groups on:

- Project risk management;
- Financial management and accountability;
- Procurement and contract monitoring;
- Environmental and social safeguards;
- Disaster risk management;
- Climate risk assessment;
- Monitoring and evaluation;
- Operation and maintenance of infrastructure.

This capacity-building programme will enhance the ability of local institutions and communities to anticipate, manage, and respond to risks, while ensuring the long-term sustainability of project investments.

Through these measures, risk management will become a shared responsibility among the NIE, PMU, Executing Entities, local governments, communities, and beneficiaries, thereby strengthening project resilience, accountability, and sustainability while fully reflecting the principles of Locally Led Adaptation.

C. Describe the measures for environmental and social risk management, in line with the Environmental and Social Policy and Gender Policy of the Adaptation Fund. Describe the role of local actors in developing and managing these measures.

The project will implement a comprehensive Environmental and Social Risk Management (ESRM) framework that is fully aligned with the **Adaptation Fund Environmental and Social Policy (ESP)** and **Gender Policy**, as well as relevant national laws, regulations, and standards of the Royal Government of Bhutan. The project has been designed as a community-driven, locally led adaptation initiative and is expected to generate significant environmental and social benefits through watershed restoration, ecosystem-based adaptation (EbA), climate-resilient water infrastructure, strengthened water governance, and community capacity development. Nonetheless, potential environmental and social risks associated with infrastructure development, ecosystem restoration activities, land use changes, social exclusion, resource-use conflicts, occupational health and safety, and gender inequalities will be systematically identified, assessed, managed, and monitored throughout the project lifecycle.

The Bhutan Trust Fund for Environmental Conservation (BTFEC), acting as the National Implementing Entity (NIE), will apply its Environmental and Social Safeguards (ESS) procedures and risk management framework during project preparation, implementation, monitoring, and evaluation. All project activities will undergo environmental and social screening prior to implementation. The screening process will identify potential risks and impacts, determine the appropriate level of assessment required, and establish corresponding mitigation measures. Where necessary, site-specific Environmental and Social Management Plans (ESMPs), Environmental Codes of Practice (ECOPs), and safeguard action plans will be prepared and implemented before commencement of physical activities.

The Environmental and Social Risk Screening was undertaken in accordance with the **Adaptation Fund Environmental and Social Policy (ESP)** and **Gender Policy**, using the 15 Adaptation Fund Environmental and Social Principles. The assessment incorporated extensive consultations with local communities, Gewog Administrations, Water User Associations (WUAs), women's groups, youth representatives, sector agencies and implementing partners. Given that the proposed interventions focus primarily on ecosystem restoration, water governance strengthening, climate-resilient water infrastructure, community capacity development, and locally led adaptation planning, the project is expected to generate significant positive environmental and social benefits. Potential adverse impacts are expected to be localized, temporary, reversible, and manageable through appropriate mitigation measures.

Project screening and categorization (For details see Table 4 , ESMP in Annex 3)

AF Principle	Assessment	Impact (1-5)	Likelihood (1-5)	Significance
Compliance with the Law	Risks may arise from inadequate understanding of water governance regulations, environmental approval requirements, community forestry regulations, WUA bylaws, and local adaptation governance arrangements. Non-compliance may also occur if local stakeholders are not fully aware of their responsibilities under sector regulations and project safeguard requirements. These risks are expected to be minimal due to strong institutional support and capacity-building activities.	3	1	**L**
Access and Equity	Remote households, female-headed households, elderly persons, persons with disabilities, and socio-economically disadvantaged households may face barriers to participating in training, consultations, adaptation planning processes, or WUA activities. Competition for water resources could potentially affect equitable access if governance systems are weak.	3	2	**M**
Marginalized and Vulnerable Groups	Vulnerable households may be underrepresented in local decision-making processes if proactive inclusion measures are not implemented. There is a risk that adaptation benefits may not be equally accessed by all social groups. However, Bhutan's strong community institutions and targeted inclusion measures significantly reduce this risk.	3	2	**M**
Human Rights	The Constitution of Bhutan guarantees equal rights and access to services for all citizens. Project interventions are expected to strengthen community resilience and improve access to essential services. No significant human rights risks have been identified.	2	1	**L**

Gender Equality and Women's Empowerment	Women play a central role in water collection, agriculture and household water management. Increased agricultural production and water availability may increase women's responsibilities if gender-responsive measures are not implemented. Women may also be underrepresented in WUA leadership and local adaptation governance structures.	3	3	**M**
Core Labour Rights	Construction contractors and temporary workers involved in water infrastructure development may present risks related to occupational health and safety, fair wages, working conditions, non-discrimination, or child labour if not properly monitored. Difficult terrain and remote worksites may increase safety risks during construction activities.	4	2	**M**
Indigenous Peoples	Not Applicable. Bhutan does not recognize separate indigenous peoples under national legislation, and project beneficiaries comprise local communities within the project landscape.	1	1	**L**
Involuntary Resettlement	The project does not involve land acquisition, displacement, relocation, or physical resettlement. Drinking water and irrigation infrastructure will primarily utilize existing alignments, community land, public land, and rights-of-way. Limited temporary access arrangements may be required during construction works.	2	1	**L**
Protection of Natural Habitats	Ecosystem restoration, watershed restoration, and springshed management activities are expected to enhance natural habitats. However, localized disturbances may occur during construction of water infrastructure, establishment of access routes, trenching, and transportation of materials. These impacts will be small-scale and temporary.	3	2	**M**

Conservation of Biological Diversity	Restoration activities are expected to improve biodiversity outcomes. Potential risks include inappropriate species selection, accidental introduction of non-native species, and temporary disturbances to wildlife habitats during construction and restoration activities. Inadequate environmental flows from water abstraction could also affect aquatic ecosystems if poorly managed.	3	2	**M**
Climate Change	Climate variability, extreme weather events, droughts, landslides, glacial melt impacts, changing hydrological patterns, and forest fires may affect project implementation, infrastructure performance, ecosystem restoration, and water availability. However, the project is specifically designed to reduce climate vulnerability and enhance resilience.	4	3	**M**
Pollution Prevention and Resource Efficiency	Increased agricultural production and climate-smart agriculture activities may result in localized increases in agrochemical use if good agricultural practices are not adopted. Construction activities may generate limited solid waste, spoil material, fuel spills, dust, and noise. Improper management of worker camps could contribute to localized pollution risks.	3	2	**M**
Public Health	Temporary risks may arise from construction activities, worker-community interactions, dust, noise, traffic movements, and operation of machinery. Water supply systems may present public health risks if operation and maintenance systems are not adequately maintained.	3	2	**M**
Physical and Cultural Heritage	Project activities may occasionally occur in areas containing religious sites, sacred landscapes, cultural features, monasteries, chortens, lhakhangs, or community cultural assets. Unintentional damage may occur if workers are not aware of local cultural sensitivities.	3	1	**L**
Lands and Soil Conservation	Trenching, excavation, minor earthworks, access route improvements, springshed restoration, and construction activities could cause localized soil disturbance, erosion, sedimentation and slope instability, particularly in steep terrain. Heavy rainfall events may exacerbate these impacts if mitigation measures are not applied.	4	2	**M**

Community Health, Safety and Security	Water infrastructure construction activities, movement of machinery, and community participation in restoration works may pose limited safety risks to residents. Resource-use conflicts related to water allocation may emerge if governance mechanisms are weak.	3	2	**M**

Environmental Risk Management Measures
Environmental risks will be minimized through the following measures:

- Conducting environmental screening and due diligence for all project activities prior to implementation.
- Avoiding interventions in environmentally sensitive or ecologically critical habitats unless conservation outcomes are explicitly intended.
- Applying ecosystem-based adaptation approaches that enhance biodiversity, watershed functions, ecosystem services, and climate resilience.
- Ensuring infrastructure designs incorporate climate resilience, erosion control, slope stabilization, and sustainable water management principles.
- Implementing measures to prevent soil erosion, sedimentation, pollution, habitat degradation, and unsustainable extraction of natural resources.
- Following national environmental clearance procedures and obtaining required approvals where applicable.
- Promoting climate-resilient native species and avoiding the introduction of invasive species in restoration activities.
- Establishing environmental monitoring systems to assess ecosystem restoration performance, water quality, watershed health, and biodiversity outcomes.
- Incorporating climate risk assessments into planning and design of infrastructure and ecosystem investments.

Social Risk Management Measures
Potential social risks, including exclusion of vulnerable groups, inequitable access to project benefits, conflicts over water resources, labor-related risks, and unintended livelihood impacts, will be managed through:

- Participatory planning and decision-making processes at Gewog and community levels.
- Inclusive stakeholder engagement and consultation throughout project design and implementation.
- Establishment of transparent and accessible Grievance Redress Mechanisms (GRMs).
- Application of Free, Prior and Informed Consultation principles during community engagement.
- Measures to ensure equitable benefit-sharing among target communities.
- Social inclusion targets for women, youth, elderly persons, persons with disabilities, and vulnerable households.
- Conflict-sensitive approaches for water allocation, resource management, and infrastructure siting.
- Occupational health and safety measures for workers, contractors, and community participants.
- Community awareness programmes on safeguards, rights, responsibilities, and grievance procedures.
- Regular social monitoring and adaptive management throughout implementation.

The Project Management Unit (PMU) will coordinate implementation of all safeguard measures and maintain safeguard monitoring and reporting systems. Environmental and social performance will be reviewed regularly by the Project Steering Committee (PSC), executing entities, and the NIE.

Gender Risk Management and Gender Equality Measures

The project will implement a Gender Action Plan (GAP) consistent with the Adaptation Fund Gender Policy and Bhutan's national commitments on gender equality and social inclusion. Gender considerations will be integrated across all project components and implementation arrangements.

The project will:

- Ensure meaningful participation of women in project planning, implementation, monitoring, and evaluation.
- Promote women's representation in Water User Associations (WUAs), Local Adaptation Committees, and project governance structures.
- Establish participation targets to ensure balanced representation in consultations, training programmes, and decision-making processes.
- Conduct gender-sensitive consultations to identify specific adaptation needs, barriers, and priorities.
- Support women's leadership development in water governance, ecosystem management, and local adaptation planning.
- Collect and report sex-disaggregated data across all project indicators.
- Integrate gender considerations into capacity-building programmes, livelihood interventions, and adaptation planning activities.
- Monitor gender-related risks and barriers throughout implementation.
- Ensure women and girls have equal access to project benefits, training opportunities, infrastructure services, and decision-making forums.

The proposed Locally Led Adaptation (LLA) project adopts a community-driven approach to environmental and social risk management, whereby local actors play a central role in identifying, managing, and monitoring risks throughout the project cycle. Gewog Administrations, Water User Associations (WUAs), Local Adaptation Committees, community leaders, women's groups, youth representatives, farmers' groups, and vulnerable households will participate in environmental and social screening, vulnerability assessments, risk mapping, and community consultations to identify site-specific environmental, social, gender, and climate-related risks. Their local knowledge and experience will contribute to the design of practical and culturally appropriate mitigation measures, including infrastructure siting, water governance arrangements, environmental safeguards, gender-responsive interventions, and operation and maintenance plans.

Local stakeholders will also support the implementation and monitoring of Environmental and Social Management Plans (ESMPs), Gender Action Plans (GAPs), and stakeholder engagement activities. Through community-based monitoring systems, WUAs, local adaptation committees, women leaders, youth groups, and Gewog Administrations will monitor ecosystem restoration activities, water source protection measures, infrastructure performance, safeguard compliance, gender inclusion, participation of vulnerable groups, and community satisfaction. Community representatives will participate in grievance redress and conflict resolution mechanisms, helping to address concerns related to water allocation, environmental impacts, infrastructure works, labour issues, social inclusion, and safeguard compliance.

To strengthen long-term sustainability, the project will provide capacity building and mentoring on environmental safeguards, watershed and water resource management, social inclusion, gender equality, grievance management, occupational health and safety, climate risk assessment, and community monitoring. Through these measures, local institutions and communities will serve not only as beneficiaries but also as active custodians of environmental and social safeguards, ensuring that project investments remain environmentally sustainable, socially inclusive, gender-responsive, and resilient beyond the project duration.

D. Describe the monitoring and evaluation arrangements and provide a budgeted M&E plan, in compliance with the Evaluation Policy, Environmental and Social Policy and the Gender Policy of the Adaptation Fund. Describe how the monitoring and innovation arrangement deploys innovative tools to enable monitoring by the community and local actors.

The project will establish a comprehensive Monitoring, Evaluation, Accountability,Learning (MEAL) framework that complies with the Adaptation Fund Evaluation Policy, Environmental and Social Policy (ESP), and Gender Policy, while also conforming to the Bhutan Trust Fund for Environmental Conservation (BTFEC) Monitoring and Evaluation Manual and institutional safeguard procedures. The MEAL framework will support adaptive management, accountability, evidence-based decision-making, safeguard compliance, and continuous learning throughout the project's four-year implementation period (2027–2030).

The Project Management Unit (PMU) will be responsible for day-to-day monitoring and evaluation coordination. A dedicated Monitoring, Evaluation and Learning Officer for the project will be recruited to oversee data collection, analysis, reporting, safeguard monitoring, gender monitoring, knowledge management, and adaptive management. The MEAL Officer will work closely with Executing Entities, Gewog Administrations, Water User Associations (WUAs), Local Adaptation Committees, and community representatives to ensure timely and accurate monitoring of project results.

During the inception phase, the project will establish baseline information to understand existing environmental, social, and livelihood conditions and provide a benchmark for measuring change over time. Progress will be monitored against the approved Results Framework using a combination of quantitative indicators and qualitative feedback from communities and stakeholders. Monitoring data will be analyzed by sex, age, Gewog, and vulnerability status to ensure that project benefits are reaching women, youth, elderly persons, persons with disabilities, and other vulnerable groups in line with the Adaptation Fund Gender Policy.
Environmental and social safeguard considerations will be integrated into the project's monitoring system. Indicators relating to ecosystem health, water security, community participation, grievance management, and gender equality will be tracked regularly to support adaptive management and timely decision-making. Project performance will be reviewed through quarterly implementation reviews, semi-annual field monitoring missions, annual learning and reflection workshops, and independent Mid-Term and Terminal Evaluations. The Project Management Unit (PMU) will prepare consolidated technical, financial, gender, and safeguards reports for submission to the Bhutan Trust Fund for Environmental Conservation (BTFEC) and the Project Steering Committee (PSC). BTFEC will subsequently submit the required reports to the Adaptation Fund Secretariat in accordance with the Fund's monitoring, evaluation, and reporting requirements.

Environmental, Social and Gender Monitoring
Environmental, social, and gender considerations will be monitored as an integral part of project implementation rather than as standalone activities. The project's monitoring and evaluation system will track how well commitments under the Environmental and Social Management Plan (ESMP), Gender Action Plan (GAP), Stakeholder Engagement Plan (SEP), and Grievance Redress Mechanism (GRM) are being put into practice and whether they are delivering meaningful benefits to local communities.
Monitoring will focus on key issues such as the participation of women and vulnerable groups, equitable access to project benefits and water resources, the effectiveness of grievance mechanisms, watershed restoration progress, biodiversity and ecosystem health, and the long-term sustainability of water sources. It will also assess occupational health and safety practices, community satisfaction with project interventions, benefit-sharing arrangements, and the extent to which women are participating in local governance and decision-making processes.
The Project Management Unit (PMU) will prepare safeguard monitoring reports every six months. These reports will be reviewed by the Project Steering Committee (PSC) and the Bhutan Trust Fund for

Environmental Conservation (BTFEC) to ensure that any emerging issues are identified and addressed in a timely manner.

Community-Based Monitoring and Innovation
In line with the principles of Locally Led Adaptation, communities will play an active role in monitoring project activities and outcomes. Rather than being passive recipients of information, local stakeholders will help generate, validate, and use monitoring data to inform decisions and guide project implementation.

To support this approach, the project will establish a Community-Based Monitoring System (CBMS) involving Water User Associations, Local Adaptation Committees, Gewog Administrations, women's groups, youth representatives, and community volunteers. These groups will work alongside the project team to collect information, track progress, and provide feedback on project performance.

The project will introduce practical and user-friendly tools to improve data collection and decision-making. Mobile applications will be used for field data collection and community reporting, while hydro-meteorological monitoring systems will combine local observations of rainfall, spring discharge, streamflow, and water availability with technical monitoring data. Participatory mapping exercises will help communities identify climate risks, water sources, and priority areas for ecosystem restoration.
Community Scorecards will provide a platform for communities to assess the quality of services, infrastructure performance, and local governance. Digital feedback and grievance channels will make it easier for people to raise concerns, share suggestions, and receive responses. Local monitors will also use photos and geo-tagged records to document changes on the ground and track project progress over time.
Regular learning and reflection workshops will create opportunities for communities and project stakeholders to review findings together, discuss lessons learned, and agree on any adjustments needed to improve project effectiveness.
By placing communities at the centre of monitoring and learning, the project will strengthen local ownership, improve accountability, and support more adaptive and responsive decision-making.

Evaluation Arrangements
The project will undertake an independent Mid-Term Evaluation in 2028 to assess progress towards project objectives, the effectiveness of implementation arrangements, safeguards compliance, gender outcomes, and overall performance. Findings from the evaluation will be used to identify areas for improvement and to make any necessary adjustments during implementation.

A Terminal Evaluation will be conducted in 2030 to assess the project's overall impact, sustainability, environmental and social performance, locally led adaptation outcomes, and potential for replication in other areas. Lessons learned from both evaluations will help inform future adaptation initiatives in Bhutan and contribute to broader knowledge-sharing efforts.

Audit and Assurance Arrangements
The Governance and Audit Committee (GAC) of BTFEC will oversee internal audit functions throughout the project. Periodic reviews will examine financial management systems, procurement processes, operational performance, fraud prevention measures, risk management arrangements, and compliance with environmental and social safeguards. These reviews will also assess whether project activities are being implemented in accordance with national regulations, project procedures, and Adaptation Fund requirements.
In addition, annual external audits will be carried out by the Royal Audit Authority (RAA) of Bhutan. These audits will provide independent assurance that project funds are being managed responsibly and used for their intended purposes in a transparent, efficient, and accountable manner.

Budgeted Monitoring and Evaluation Plan (2027–2030)

M&E Activity	Frequency	Responsibility	Budget (USD)	Note
Baseline Survey and Inception Assessment	Year 1	PMU, NIE, Communities, Executing Entities	15,000	Included under NIE Fee
Recruitment of M&E for PMU	Year 1	PMU	60000	Included under PMU
Semi-Annual Monitoring Missions	Twice per year	PMU, Executing Entities	30,000	Included under PMU
Environmental and Social Safeguards and Gender Expert & Monitoirng	Semi-Annual	PMU, Safeguards Specialist	50,000	Included under NIE Fee
Annual Learning and Reflection Workshops	Annual	PMU/NIE	20,000	Included under NIE Fee
PSC Meetings , TAC Meetings & Workshops	Semi-Annual	PMU, NIE, Executing	30,000	Included under PMU
Mid-Term Evaluation (Independent)	Year 2	External Evaluator	30,000	Included under NIE Fee
Terminal Evaluation (Independent)	Year 4	External Evaluator	45000	Included under NIE Fee
External Audit (RAA)	Annual	Royal Audit Authority (RAA)	6,000	Included under NIE Fee
Knowledge Products, Case Studies and Learning Outputs	Continuous	PMU	5,000	Included under PMU
Total M&E Budget			**291,000**	

E. Include a results framework for the project proposal, with a set of measurable milestones, targets and smart indicators, in compliance with the Gender Policy of the Adaptation Fund.[96]

The Results Framework is aligned with the Adaptation Fund Results Framework, the Environmental and Social Policy (ESP), and the Gender Policy. All indicators are SMART (Specific, Measurable, Achievable, Relevant and Time-bound) and include gender-responsive and socially inclusive targets. Baseline value will be confirmed during the inception phase.

[96] https://www.adaptation-fund.org/wp-content/uploads/2022/07/New-Design-Evaluation-Policy.pdf The AF utilized OECD/DAC terminology for its results framework. Project proponents may use different terminology, but the overall principle should still apply

Project Results	Indicator(s)	Baseline	Target(s)	Means of Verification	Risks and Assumptions
Project Objective: To build resilience to climate change and enhance adaptive capacity of water-stressed communities					
	Number of beneficiaries	12313 individuals	**15000** beneficiaries	Baseline and endline surveys; beneficiary database; Dzongkhag records	Communities actively participate and remain engaged throughout the project period
	Total land area brought under climate-resilient management	0 ha	TBC ha (TBC ha watershed management; **347** ha sustainable land management)	GIS mapping, land-use records, watershed intervention reports	Long-term protection of restored landscapes is maintained
COMPONENT 1	**Ecosystem-Based Adaptation to Ensure Natural Capacity for Water Infiltration, Recharge and Water Buffering**				
Outcome 1	**Increased ecosystem resilience in response to climate change and variability-induced stress**				
	Number of ecosystem-based adaptation interventions implemented	Limited and fragmented interventions	EbA interventions implemented across all targeted watersheds and recharge areas	Project progress reports; field verification reports	Extreme climate events do not exceed design thresholds
Output 1.1 Water Resource Management and Governance Strengthened	Revised Water Policy and Vision developed and endorsed	Water Policy and Vision 2008, outdated	Policy revised and endorsed	Policy endorsed notification	Timely policy approval, policy changes
	Wangchhu River Basin Management Plan developed	One, non-operational	One basin plan operational	Operational Wangchhu RBMP	Inter-agency collaboration and support
Output 1.2 Ecosystem-Based Adaptation and Sustainable Land Management Measures Implemented	No. of scheme-based watershed rehabilitation and ecosystem restoration	0	5	Watershed intervention report	number of watershed restoration based on the findings of watershed assessment

	Drought Preparedness and Response Plan developed	0	DPRP developed for Thimphu Dzongkhag	Approved DPRP	Technical coordination among agencies
Output 1.3 Integrated Forest Fire Management Strengthened	Gewog Forest Fire Coordination Groups established	0	5 Gewog Forest Fire Coordination Groups established	DoFPS records, meeting reports, TORs and no. of GFFCGs created	Continued volunteer participation
COMPONENT 2	**Community-Based Climate-Resilient Drinking Water and Irrigation Infrastructure Established**				
Outcome 2	**Increased access to reliable climate-resilient drinking water and irrigation services**				
	Population benefiting from climate-resilient water supply systems	To be established through baseline survey	All households served by five water-supply schemes and four irrigation schemes	Household surveys; water service records	Water sources remain productive under climate change
Output 2.1 Enhanced Access to Clean and Safe Drinking Water	Number of Climate-resilient drinking water schemes constructed	Existing inadequate systems	Five major water supply systems completed (Woluna, Changtagang, Helela-Chamgang, Rama, Khasadrapchu)	Engineering completion certificates	Construction completed on schedule
Output 2.2 Enhanced Access to Adequate Irrigation Water	Number of Irrigation infrastructure constructed and rehabilitated	Existing climate-vulnerable channels	Four irrigation schemes completed	Completion certificates	Timely construction
COMPONENT 3	**Capacity of Communities and Institutions on Adaptation Planning and Water Resource Management Enhanced**				
Outcome 3	**Increased resilience of local communities through enhanced capacity in adaptation planning and implementation**				

	Number of people with increased adaptive capacity (sex-disaggregated)	Limited adaptation capacity	At least 200 people trained and applying adaptation practices	Training records; surveys	Participants remain engaged and apply knowledge
Output 3.1 Water User Associations Strengthened	Water User Associations established or strengthened	Non-formal	5 WUAs proposed	WUA formation /sensitization documents	Need assessment, and willingness from the community, as WUA formation is voluntary
Output 3.2 Capacity for Adaptation Planning and Implementation Enhanced	Community engagement platforms operational	None	5 CEPs established	Meeting records	Stakeholder participation maintained
Output 3.3 Knowledge Management, Learning and Monitoring Strengthened	Knowledge products developed and disseminated	None	5 knowledge products produced	Publications and dissemination records	Stakeholders utilize knowledge products

F. Demonstrate how the project / programme aligns with the Results Framework of the Adaptation Fund, including its core impact indicators.

The project aligns strongly with the Adaptation Fund Results Framework by addressing the three interconnected adaptation priorities identified for Thimphu Dzongkhag: ecosystem resilience, climate-resilient water security, and community adaptive capacity. Investments in watershed restoration, sustainable land management, and forest fire management contribute to ecosystem resilience and reduced climate risks. Climate-resilient drinking water and irrigation infrastructure directly enhance water security and reduce vulnerability of rural households and agricultural systems. Capacity building, establishment of Water User Associations, and localized water governance plans strengthen community ownership and institutional capacity for adaptation. Together, these interventions contribute to the Adaptation Fund's core impact of increasing the resilience of ecosystems, communities, and livelihoods to climate change while promoting the integration of climate-resilient development planning at local and district levels.

Project Outcome(s)	Project Outcome Indicator(s)	Fund Outcome	Fund Output	Fund Output Indicator /Core Impact indicator
Outcome1: Increased ecosystem resilience in response to climate change and variability-induced stress.				

Output 1.1 Water Resource Management & Governance strengthened	No. of water policy plans revised. No. of River Basin Management Plan developed.	**Outcome 7** Improved integration of climate-resilience strategies into country development plans	**Output 7**	**7.1. No. of policies introduced or adjusted to address climate change risks (by sector)**
Output 1.2 Ecosystem based solutions /SLM interventions to enhance watershed functions implemented	Area (Ha) of degraded watersheds restored through eco-restoration.	**Outcome 3** Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	**Output 3.2**	**3.2. Percentage of targeted population applying appropriate adaptation responses**
Output 1.3. Management of forest fire hazards by promoting integrated forest fire management	Number of Community Forest Fire Management groups (CFFMGs) established	**Outcome 1:** Reduced exposure to climate-related hazards and threats	**Output 1**	**1. Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis**
Outcome 2: Ensured access to irrigation and safe and reliable drinking water.				
Output 2.1 Community-based climate resilient drinking water infrastructure established.	Number of resilient drinking water supply systems established.	***Outcome 4:*** Increased adaptive capacity within relevant development and natural resource sectors	Output 4.2	**Physical infrastructure improved to withstand climate change and variability-induced stress**
Output 2.2 Community-based climate resilient irrigation infrastructure established & improved.	Number of irrigation infrastructures improved/established.	Outcome 4	Output 4.2	**Physical infrastructure improved to withstand climate change and variability-induced stress**
	Area (Ha) of agricultural land with access to adequate water for irrigation.	Outcome 4	Output 4.2	**Agricultural land benefiting from climate-resilient infrastructure**
Outcome 3: Increased resilience of local communities to climate change through enhanced capacity in adaptation planning and implementation				

Output 3.1 User groups in the community strengthened for effective management of irrigation and drinking water	No. of Water User Associations (WUAs) established and formalized.	**Outcome 3:** Strengthened awareness and ownership of adaptation and climate risk reduction processes	Output 3.1	**Targeted population participating in adaptation and risk reduction activities**
Output 3.2 Capacity of local communities, local leaders and organizations enhanced on local adaptation planning and implementation.	No. of people (local communities /LG Leaders) trained on Adaptation Planning and Project Implementation	Outcome 3	Output 3.2	**Percentage of targeted population applying adaptation responses**
Output 3.3 Dissemination of Project Results and Lessons Learned	No.of/Knowledge Sharing and Learning Sessions/Workshops conducted.	**Outcome 7:** Improved integration of climate resilience into planning processes	Output 7	**Knowledge products and lessons influencing adaptation planning and decision-making**

G. Include a detailed budget with budget notes, a budget on the Implementing Entity management fee use, and an explanation and a breakdown of the execution costs[97].

Component 1: Ecosystem-Based Adaptation to Ensure Natural Capacity for Water Infiltration, Recharge and Water Buffering						
Output	**Activities**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Total (USD)**
Output 1.1 Water Resource Management & Governance Strengthened	1.1.1 a Revision of Water Policy and Vision 2008	25,000	0	0	0	25,000
	1.1.2.a Develop Wangchhu River Basin Management Plan	30,000	30,000	26,000	0	86,000
	1.1.2.b Develop Wangchhu Water Security Index System	15,000	15,000	10,000	0	40,000
	1.1.2.c Establish Wangchhu River Basin Committee	0	0	5,000	0	5,000
	1.1.3a Establish Water Knowledge Bank and Strengthen Water Curricula	46,000		0	0	46,000
	1.1.3b Assess the ongoing water adaptation activities and publish a paper on the future intervention measures.	0	15,000	0	0	15000
	1.1.4a Hydrogeological Mapping and Recharge Assessment	45,000	0	0	0	45,000
	1.1.4b Design and Implement EbA Watershed Restoration Measures	0	311,000	0	0	311,000
	1.1.4c Establish Microclimate and Meteorological Monitoring Stations	0	37,500	0	0	37,500

[97] IE and EE fees calculator: https://www.adaptation-fund.org/document/ie-and-ee-fees-calculator/

	1.1.4d Capacity Building on Hydrological Modelling	0	25,000	0	0	25,000
Subtotal Output 1.1		**161,000**	**433,500**	**41,000**	**0**	**635,500**
Output	**Activities**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Total**
Output 1.2 EbA Solutions and Sustainable Land Management Implemented	1.2.1a Support Sustainable Land Management and Land Development Measures (terrace development and consolidation)	10,000	5,000	5,000	0	20,000
	1.2.1b Support sustainable land development through efficient utilization of agricultural land (bioengineering, check -dam & orchard basin management)	2000	2000	2000	0	6000
	1.2.1c Conduct feasibility study for storing excess water.	7,500	7,500	0	0	15,000
	1.2.1d Develop and design an implementation plan	20000	20000	0	0	40,000
	1.2.1e Develop Climate-Resilient Water and Water Services Framework	0	30,000	0	0	30,000
	1.2.2a Develop a guideline for an overall framework for DPRP and develop DPRP for Thimphu Dzongkhag	22,500	22,500	0	0	45,000
	1.2.3 Promote Climate-Smart Agriculture Practices	9,200	9,200	0	0	18,400
Subtotal Output 1.2		**69,200**	**97,200**	**8,000**	**0**	**174,400**
Output	**Activities**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Total**

Output 1.3 Mitigation of forest fire hazards by promoting integrated forest fire management.	1.3.1 Establishment of Gewog level forest fire coordinating group (GFFCG) in Thimphu district to foster community participation in forest fire management	10,000	10,000	0	0	20,000
	1.3.1 Development of Ecosystem based adaptation solutions (Earthen dam) for forest fire suppression.	4,500	4,500	0	0	9,000
Subtotal Output 1.3		**14,500**	**14,500**	**0**	**0**	**29,000**
Component 2: Community-Based Climate Resilient Drinking Water and Irrigation Infrastructure						
Output	**Activities**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Total**
Output 2.1 Enhanced Access to Clean and Safe Drinking Water	2.1.1Construction of Woluna Water Supply Scheme	137,873	137,873	0	0	275,746
	2.1.2 Construction of Changtagang Water Supply Scheme	106,107	106,107	0	0	212,214
	2.1.3 Construction of Helela–Chamgang Water Supply Scheme	144,581	144,581	0	0	289,162
	2.1.4 Construction of Domtshang Ney–Khasadrapchu Water Supply Scheme	117,831	117,831	117,832	0	353,494
	2.1.5 Construction of Rama Water Supply Scheme	88,746	88,746	0	0	177,492
Subtotal Output 2.1		**595,138**	**595,138**	**117,832**	**0**	**1,308,108**
Output	**Major Activities**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Total**
Output 2.2 Enhanced Access to Adequate Irrigation Water	2.2.1 Rehabilitation of Lower Danglo Irrigation Channel	61,603	61,603	0	0	123,206
	2.2.2 Rehabilitation of Dalukha-Khasakha Irrigation Channel	138,497	138,497	0	0	276,993

	2.2.3 Rehabilitation of Dalukha-Dalulum Irrigation Channel	100,808	100,808	0	0	201,616
	2.2.4 Construction of Gangritueshay-Zangleykha Irrigation Scheme	283,645	283,645	283,645	283,646	1,134,581
Subtotal Output 2.2		**584,553**	**584,553**	**283,645**	**283,646**	**1,736,396**
Component 3: Capacity of Local Communities and Organizations Enhanced						
Output	**Activities**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Total**
Output 3.1 Community-Based Water User Associations Strengthened	3.1.1 Establishment and Strengthening of Water User Associations (WUAs)	0	0	120,250	0	120,250
Subtotal Output 3.1		**0**	**0**	**120,250**	**0**	**120,250**
	Major Activities	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Total**
Output 3.2 Capacity of Communities, Leaders and Organizations Enhanced	3.2.1 Capacity building on climate change adaptation, planning and implementation for local leaders and communities	38,833	20,833	40,000	0	99,666
	3.2.2 Conduct training workshops on project management; financial management; advocacy and communication skills for local leaders to strengthen the organizational and leadership skills.	0	0	10,000	0	10,000
	3.2.3 Engineers and Technicians Capacity Development	30,000	37,500	0	0	67,500
	3.2.4 Capacity building training workshop for communities on integrated water resource management and sustainable agricultural practices.	1,667	1,667	1,666	0	5,000

	3.2.5 Capacity building training workshop on disaster risk management including forest fires, flash floods, landslides, etc.	0	15,000	0	0	15,000
Subtotal Output 3.2		**70,500**	**75,000**	**51,666**	**0**	**197,166**
	Activities	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Total**
Output 3.3 Knowledge Management, Learning and Dissemination Strengthened	Knowledge Products, Learning Forums and Dissemination	0	0	2000	3,000	5,000
Subtotal Output 3.3		**0**	**0**	**2000**	**3,000**	**5,000**
	Total Direct Cost	8,78,500	15,73,500	12,84,950	4,68,871	**42,05,820**
	Project Execution Cost (PMU)	77119	143144	115732	38204	**3,74,200**
	Total (Direct + PMU Cost)	**9,55,619**	**17,16,644**	**14,00,682**	**5,07,075**	**45,80,020**
	PCM Fee Charged by the Implementing Entity	**72459**	**137147**	**110290**	**34333**	**3,54,230**
	GAP Mitigation	**13217**	**24917**	**1666**	**0**	**39800**
	ESMP	**8967**	**5367**	**8241**	**3375**	**25950**
	Grand Total	**10,50,263**	**18,84,076**	**15,20,879**	**5,44,784**	**5000,000**

Budget Notes

Sl. No.	Component 1: Ecosystem-based Adaptation to Ensure Natural Capacity for Water Infiltration, Recharge and Water Buffering (Total: USD 838,900)
1	**Revision of Water Policy and Vision 2008** through five stakeholder consultation and validation workshops at a unit cost of USD 5,000 per workshop. **Total: USD 25000**
2	**Development of Wangchhu River Basin Management Plan** including stakeholder consultations, data collection, hydrological assessment and expert consultancy services for integrated river basin planning. **Total: USD 86,000**

3	**Development of Wangchhu Water Security Index System** including consultations, technical assessments and consultancy inputs for water security monitoring and decision support. **Total: USD 40,000.**
4	**Establishment of the Wangchhu River Basin Committee** through stakeholder workshops and institutional coordination mechanisms. **Total: USD 5,000.**
5	**Strengthening the Water Resources Curriculum and Water Knowledge Bank** at the College of Science and Technology through curriculum development workshops, procurement of equipment and establishment of learning resources. **Total: USD 61,000.**
6	**Hydrogeological Mapping and Recharge Assessment** for nine water supply catchments to identify recharge zones and potential water source protection interventions at USD 5,000 per survey. **Total: USD 45,000.**
7	**Design and Implementation of Ecosystem-based Adaptation (EbA) Measures** including watershed consultations and implementation of five watershed intervention packages at an average cost of approximately USD 62,200 per intervention package. **Total: USD 311,000.**
8	**Installation of Microclimate and Meteorological Monitoring Stations** including procurement of five stations and associated protective structures. **Total: USD 37,500.**
9	**Capacity Building on Hydrological Modelling** for five technical officials to strengthen climate and water modelling capacity. **Total: USD 25,000.**
	Sub-total Output 1.1: USD 635,500
10	**Sustainable Land Management (SLM) Measures** covering terrace development, land consolidation, bioengineering, check dams and orchard basin management across approximately 70 acres. **Total: USD 26,000.**
11	**Feasibility Studies and Design of Water Storage Systems** including three feasibility assessments and implementation planning consultancy services. **Total: USD 55,000.**
12	**Development of Climate-Resilient Water and Water-related Services Framework** through consultations and expert technical support. **Total: USD 30,000.**
13	**Development of Drought Preparedness and Response Plan (DPRP)** including framework preparation, consultations and technical consultancy. **Total: USD 45,000.**
14	**Promotion of Climate-Smart Agriculture Practices** through support for protected agriculture, smart irrigation, water harvesting technologies, GAP, organic agriculture and IPM. **Total: USD 18,400.**
	Sub-total Output 1.2: USD 174,400

15	**Establishment and Capacity Building of Gewog Forest Fire Coordinating Groups (GFFCGs)** including consultations, development of guidelines, training and firefighting equipment. **Total: USD 20,000.**
16	**Nature-based Forest Fire Suppression Measures** through construction of three earthen water storage dams for forest fire response. **Total: USD 9,000**
	Sub-total Output 1.3: USD 29,000
	Total Component 1: USD 838,900
	Component 2: Community-based Climate Resilient Drinking Water and Irrigation Infrastructure (Total: USD 3,044,505)
17	**Construction of Five Climate-Resilient Drinking Water Supply Schemes** (Woluna, Changtagang, Helela–Chamgang, Domtshang Ney–Khasadrapchu and Rama) including intakes, reservoirs, transmission and distribution systems, labor, materials, and contractor services. **Total: USD 1,308,108.**
18	**Rehabilitation of Three Irrigation Systems** (Lower Woluna–Danglo, Dalukha–Khasakha and Dalukha–Dalulum) including rehabilitation works, engineering services, materials and labor. **Total: USD 601,815.**
19	**Construction of Gangritueshay–Zangleykha Irrigation Scheme** including intake structures, conveyance systems and associated infrastructure. **Total: USD 1,134,581.**
	Total Component 2: USD 3,044,505
	Component 3: Capacity of Local Communities and Organizations Enhanced (Total: USD 322,417)
20	**Community Engagement and Strengthening of Water User Associations (WUAs)** through consultations and training of approximately 90 WUA office bearers on governance, financial management and monitoring. **Total: USD 120,250.**
21	**Capacity Building of Local Government Functionaries on Climate Change Adaptation and Mainstreaming** including curriculum development, engagement platforms and training workshops. **Total: USD 99,667.**
22	**Leadership, Advocacy and Communication Skills Training** for local government leaders and community representatives. **Total: USD 10,000.**
23	**Capacity Building for Engineers and Technicians** on sustainable water supply management and climate-resilient irrigation system design. **Total: USD 67,500.**
24	**Community Capacity Building on Sustainable Agriculture and Integrated Water Resource Management** for farmers and extension personnel. **Total: USD 5,000.**
25	**Disaster Risk Management Capacity Building** including training on forest fires, flash floods and landslides. **Total: USD 15,000.**

26	**Knowledge Management, Learning and Dissemination Activities** including development of project knowledge products, dissemination materials and learning platforms. **Total: USD 5,000**
	Total Component 3: USD 322,417
	Project Execution Cost (Total: USD 366,800)
27	Project Management Unit (PMU) comprising Project Manager, two Project Engineers, M&E Officer, travel and transportation, office equipment and furniture, IT equipment, capacity-building, stakeholder consultations, TAC and PSC and coordination meetings, safeguard implementation and grievance redress mechanisms. **Total: USD 366,800**
	Project Cycle Management Fee Charged by the Implementing Entity (Total: USD 318,000)
28	Compensation for implementing entity staff, M&E monitoring missions, ESG and Gender consultancy support, mid-term and terminal evaluations, mobility, office operations, NIE capacity building, audits, inception workshop and dissemination workshops. **Total: USD 318,000.**

H. Include a disbursement schedule with time-bound milestones.

Schedule Year	**Jan- Dec 27**	**Jan-Dec-28**	**Jan-Dec 29**	**Jan-Dec30**	**Total (USD)**
Total Direct Cost	8,78,500	15,73,500	12,84,950	4,68,870	**42,05,820**
Project Execution Cost (PMU)	77119	143144	115732	38204	**3,74,200**
Total (Direct + PMU Cost)	**9,55,619**	**17,16,644**	**14,00,682**	**5,07,075**	**45,80,020**
PCM Fee Charged by the Implementing Entity	**72459**	**137147**	**110290**	**34333**	**3,54,230**
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ESMP	**8967**	**5367**	**8241**	**3375**	**25950**
Grand Total	**10,50,263**	**18,84,076**	**15,20,879**	**5,44,784**	**50,00,000**

PART IV: ENDORSEMENT BY GOVERNMENT AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. Record of endorsement on behalf of the government[98]

Provide the name and position of the government official and indicate date of endorsement. If this is a regional project/programme, list the endorsing officials all the participating countries. The endorsement letter(s) should be attached as an annex to the project/programme proposal. Please attach the endorsement letter(s) with this template; add as many participating governments if a regional project/programme:

(Enter Name, Position, Ministry)	Date*: (Month, day, year)*
Mr. Tshering Dorji Director General, Department of Macro-Fiscal and Development Finance Ministry of Finance	July 23, 2026

B. Implementing Entity certification

Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/programme contact person's name, telephone number and email address.

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans (National Adaptation Plan, 13th Five Year Plan of Royal Government of Bhutan and Adaptation Fund's New funding window of Locally Led Adaptation) and subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy and the Gender Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.

Name & Signature Dr. Karma Tshering, Managing Director. Implementing Entity Coordinator	
Date: *(Month, Day, Year)*	Tel. and email: +97517162393 karma@bhutantrustfund.bt
Project Contact Person: Sonam Lhamo, Project Specialist	
Tel. and Email: 00975-17411353 sonaml@bhutantrustfund.bt	

[98] Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

Annex 1. Community Consultation Report

Annex 2. Gender Action Plan

Annex 3. Environmental and Social Safeguard Management Plan

Annex 4. Analysis of Indigenous Knowledge, Strategies and Traditional Practices in Water Management and Ecosystem-based Adaptation

Annex 5. Letter of Endorsement

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Ministry of Finance
Royal Government of Bhutan
Department of Macro-Fiscal and Development Finance

MoF/DMDF/DCDMD/AF_LLA/BTFEC/2026-2027/**161** July 24, 2026

To:

The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Subject: Endorsement for Securing Water and Enhancing Climate Resilience in Thimphu (Rural) District, Bhutan

In my capacity as designated authority for the Adaptation Fund in Bhutan, I confirm that the above national grant proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in the country.

Accordingly, I am pleased to endorse the above grant proposal with support from the Adaptation Fund. If approved, the project will be implemented by Bhutan Trust Fund for Environmental Conservation and executed by Thimphu Dzongkhag/District Administration.

Thanking you.

Yours Sincerely,

(Tshering Dorji)
Director General/Designated Authority of Bhutan to the Adaptation Fund

Copy to:

1. Dzongdag, Thimphu Dzongkhag Administration for kind information.
2. Managing Director, Bhutan Trust Fund for Environmental Conservation, Thimphu for kind information and support.

Securing Water and Enhancing Climate Resilience in Thimphu (rural) District, Bhutan

Adaptation Fund (AF) Single Country Locally Led Aadaptation (LLA) Project

GENDER ANALYSIS &
Gender Action Plan (GAP)

Prepared and submitted as Annex to the full Project Proposal Document under Single Country LLA Project on ' Securing Water and Enhancing Climate Resilience in Thimphu (rural) District, Bhutan'.

Department of Macro-fiscal and Development Finance (DMDF), Designated Authority (DA)

Bhutan Trust Fund for Environmental Conservation (BTF) National Implementing Entity (NIE), Thimphu, Bhutan

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ACRONYM/ABBREVIATIONS

AF	:	Adaptation Fund
BPfA	:	Beijing Platform for Action
BTF	:	Bhutan Trust Fund for Environmental Conservation
CBWM	:	Community-based Water Management
CC	:	Climate change
CCPB		Climate Change Policy of Bhutan
CEDAW	:	Convention on the Elimination of All Forms of Discrimination Against Women
CFG	:	Community Forestry Group
EbA	:	Ecosystem-based Adaptation
ERS	:	Environmental and Social Risks
FGD	:	Focus Group Discussion
GAO	:	Gewog Administrative Officer
GAP	:	Gender Action Plan
GBV	:	Gender-based Violence
GESP	:	Gender Equality Strategy Framework
GP	:	Gender Policy
HH	:	Household
LG	:	Local Government
LLA	:	Locally-led Adaptation
M&E	:	Monitoring and Evaluation
NAP	:	National Adaptation Plan
NES	:	National Environment Strategy
N/IE	:	National Implementing Entity
NGEPB	:	National Gender Equality Policy of Bhutan
NRM	:	Natural Resource Management
PHCB	:	Population and Housing Census of Bhutan
RNR	:	Renewable Natural Resources
SDG	:	Sustainable Development Goals
SLM	:	Sustainable Land Management
WUA	:	Water User Association

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1. INTRODUCTION

1.1 Rationale and Purpose

1. This gender analysis was carried out as part of the '*full project proposal development*' for the Adaptation Fund's (AF) Single Country Locally Led Adaptation (LLA) funding window on the project, '*Securing Water & Enhancing Climate Resilience in Thimphu (Rural) District, Bhutan'*. The Project aims to enhance the climate adaptation capacities and resilience of Thimphu district's vulnerable rural communities (five Gewogs) through improved integrated water management system and ecosystem-based adaptation (EbA) practices[1].

2. In line with the Project's objectives and thematic focus, this gender analysis was built on the understanding that community-based water management (CBWM) and EbA initiatives involve direct interaction with local communities' daily resource use. Women and men have different roles, responsibilities, and knowledge regarding water and natural resource management. The gender norms, relations and inequalities in the community often influence women and men's access to water and ecosystem resources, participation in resource governance and decision-making process, benefit-sharing from the EbA interventions, and their adaptive capacity to climate change. Understanding these differences through a comprehensive gender analysis ensures inclusive, effective, and sustainable interventions to improve the different ways women, men, girls and boys use, manage, and benefit from water resources and ecosystems services. In that respect, this gender analysis was carried out to gather critical insights into how social and gender dynamics influence water management and climate adaptation in the project Gewogs.

3. Besides sex-disaggregated data and differential roles of women and men, the gender analysis included the differentiated climate change impacts on different gender groups and their differentiated adaptation capabilities[2]. It assessed how the livelihoods of men and boys, women and girls are, or, likely to be affected differently by climate change due to cultural norms and gendered perceptions.

4. The findings of gender analysis informed the development of corresponding gender-responsive adaptation interventions, to address identified differences, impacts and risks, and opportunities for

[1] Project's Concept Note.
[2] Para 24 of Updated Gender Guidance Document for Implementing Entities on Compliance with the Adaptation Fund Gender Policy, 2022.

equitable benefits for all gender groups[3]. They are presented in a framework of Gender Action Plan (GAP).

5. This gender analysis exercise represents full compliance to the requirement of AF's Gender Policy (GP) for implementing entities (IE) to *undertake a gender assessment during the project proposal development to select gender-responsive indicators, collect gender-disaggregated data, and to design gender-responsive implementation and monitoring arrangements*[4]. It is intended to '*comply with the dual mandate of AF's gender approach on analysing and addressing gender-differentiated impacts and risks ("do no harm") and to detail gender-responsive opportunities to proactively address persistent gender gaps ("do good")*'[5]. In particular, the gender analysis identifies project-related risks to gender equality and women's empowerment, including the gender-specific cultural and legal contexts in which the project will operate, as well as specify the gender-differentiated impacts of intended adaptation activities to be funded.

1.2 Objectives of Gender Analysis

6. The specific objectives of this gender analysis were[6]:

(a) Identify gender roles and responsibilities in water collection, ecosystem management, and climate adaptation activities.
(b) Find out gender-based access and control over water resources, land, technologies, financial resources, and information.
(c) Examine participation and decision-making power of women and men in community water governance and ecosystem management institutions.
(d) Understand gender-differentiated impacts of climate change, such as increased workload, health risks, and livelihood challenges.
(e) Identify barriers and opportunities for gender equality in water management and ecosystem-based adaptation.
(f) Understand capacity-building needs of women and men the project's thematic areas.
(g) Provide recommendations for gender-responsive policies, programs, and interventions.

[3] AF's Updated Gender Guidance Document for Implementing Entities on Compliance with the Adaptation Fund Gender Policy (2022), Para 19, 21 & 25.
[4] AF's GP, para 16; AF's Updated Gender Guidance Document for Implementing Entities on Compliance with the Adaptation Fund Gender Policy (2022), Para 1, 9 & 19.
[5] AF's GP, para 16.
[6] Updated Gender Guidance Document for Implementing Entities on Compliance with the Adaptation Fund Gender Policy, 2022, Para 24.

1.3. Approach and Methodology

7. In compliance to the AF's GP requirements (para 17), the gender analysis was carried out based on a meaningful and comprehensive consultation with intersectional stakeholders in a gender-responsive, inclusive, participatory, and fully transparent process[7]. The consultation findings served as a basis of identifying gender differences (supported with empirical evidence in the form of qualitative and quantitative data) in terms of roles, activities, needs, and available opportunities and challenges or risks within the Project's context. Consultations were conducted within the context and background of Bhutan's socio-economic, political, legal context in which the project will operate, including the current cultural norms, and gender concerns and issues assessed based on an extensive literature review[8].

8. This gender analysis was guided by the conceptual framework summarised below:

Table 1: Conceptual Framework

8.1	***Gender Mainstreaming*** **is** a strategy for integrating gender perspectives into policies, programs, and projects across all stages to ensure that outcomes benefit all genders equitably. It goes beyond "women-focused" action to transformational change in gender norms and power relations. Gender mainstreaming is not a stand-alone activity but integral to planning, implementation, monitoring, and evaluation of programmes.
8.2	**Gender Equality** provides equal rights, responsibilities, and opportunities of all genders. Gender equity recognises inequalities created by structural barriers, and allocates resources or benefits to achieve fairness. Areas of gender equality in water management and adaptation includes: equal access to water; equal control and management, equal participation and decision-making roles, equal labour burdens.
8.3	In **CBWM** practices**,** local communities govern the water resources through their own governance framework (committees, water user associations, etc) and processes (governance and management guidelines) to meet their water needs (drinking, farming and irrigation).
8.4	**EbA** means use of biodiversity and ecosystem services to help communities adapt to climate change (e.g., watershed restoration to regulate water flows). The concept of **locally-led EbA** lies in the use of adaptation initiatives using local priorities and knowledge with direct involvement of the affected community members in planning and implementation of the adaptation interventions.

[7] Updated Gender Guidance Document for Implementing Entities on Compliance with the Adaptation Fund Gender Policy, 2022, Para 16 & 19.
[8] Updated Gender Guidance Document for Implementing Entities on Compliance with the Adaptation Fund Gender Policy, 2022, Para 23.

8.5	**Mainstreaming gender and promotion of gender equality are not just social imperatives**. They enhance knowledge, governance, resilience, and sustainability of community-based water management and EbA efforts. Ignoring gender dimensions risks ineffective interventions and perpetuates inequalities.
8.6	Effective gender equality enhances sustainability of water systems, community's resilience to climate change, and equitable social outcomes. The need for gender analysis for gender mainstreaming and gender equality in water management and EbA is premised on the following: • **Differential roles of women and men:** Women and men engage themselves with their differential roles. Women often bear the primary responsibility for domestic water collection and household water quality. Men often control water infrastructure, agricultural irrigation, and cash resources. • **Differential Impacts:** Water scarcity and climate variability affect women and marginalized groups disproportionately due to varying labour demands from women and men, health outcomes, and livelihood risk. Example, water insecurity increases women's unpaid care-works labour and reduces time for education or income-generating activities, which does not happen much to men due to men out-migration for alternative opportunities outside the household chores. • **Participation and Decision Making:** Women's participation in water management strategies such as engagement in water user groups increases equity and improves outcomes. However, women are not usually given adequate access to water management due to stereotypes and gendered perceptions prevailing among the community members. The most common involvement of women lies in 'token representation', which means that women are involved for head count without much rights and platform for influencing the decision-making of results and benefit-sharing. Gender gaps in participation and decision-making are created often by the formal norms of socio-cultural practices in the communities. • **Access to Resources**: When women have access to critical resources such as finance, land and training courses, community-management of water systems improves and become more sustainable. However, in general, it is mostly men that takes the rights to access to resources and control them, with women being the passive recipients of benefits controlled by men. • **Climate and EbA Outcomes**: EbA interventions that integrate local gender knowledge led to better adaptation and resilience outcomes. Restoration of wetlands co-managed by mixed-gender groups improve water availability and enhance women's leadership.
8.7	**Barriers to gender equality, mainly includes:** • **Socio-cultural norms and patriarchy:** Gender norms restrict women's mobility, voice, and access to formal decision-making. Gender norms determine gendered roles, which have influence over decision-making for participation, leadership roles and benefit-sharing.

	• **Policy and institutional gaps:** Policies often mandate gender mainstreaming but lack implementation mechanisms, budgets, or gender expertise. • **Capacity Constraints:** Local institutions and community members may lack gender training, facilitation skills, or understanding of gender power relations.
8.8	**Gender equality in community-based or locally-led water management and EbA enhances the effectiveness of interventions as well as promotion of social justice**, through the following interventions: • *Inclusive Decision-Making*: Women often have distinct knowledge about local water sources, seasonal changes, and ecosystem services because of their roles in household water collection, agriculture, and natural resource management. Ensuring gender equality in decision-making processes allows communities to benefit from their knowledge, resulting in more sustainable and effective water management strategies. • *Improved Resource Management*: Equal participation by women with men in water committees or ecosystem governance ensures better maintenance of water systems, and fair allocation of resources. For example, equitable participation can reduce over-extraction, improve water quality, and increase resilience to droughts and floods. • *Enhanced Community Resilience*: EbA interventions rely on local communities to protect and restore ecosystems that safeguard climate impacts. Gender-inclusive approaches ensure that both men and women contribute to identifying vulnerabilities and implementing adaptive solutions, resulting in strengthened overall community resilience. • *Economic and Social Benefits*: Women's involvement in water management can lead to income-generating opportunities, such as community irrigation projects, sustainable aquaculture, or eco-tourism. Gender equality also promotes education, health, and empowerment, which reinforces the social fabric necessary for long-term adaptation initiatives. • *Equity and Social Justice*: Water access and ecosystem services are often unequally distributed, with women and marginalized groups disproportionately affected. Integrating gender equality in local water governance ensures fair access to resources, reduces conflict, and aligns with human rights principles. • *Better Outcomes for Climate Adaptation*: Gender-sensitive approaches help identify differentiated climate vulnerabilities and adaptive capacities. Policies and interventions designed with perspectives of both women and men are more context-specific and effective, leading to durable environmental and social outcomes.
8.9	**Gender equality is not just a social goal but a practical strategy** that helps enhance the sustainability, equity, and resilience of community-based water management and EbA initiatives. Ignoring it risks undermining the effectiveness of interventions and marginalizing key community knowledge and labour.

8.10	**Gender equality measures must ensure considering strategies beyond token representation**, for: more effective adaptation solutions that reflect on-the-ground gendered realities; greater sustainability of water and ecosystem interventions due to strengthened community legitimacy; and, broader social outcomes, such as shifts in gender roles and enhanced leadership opportunities for women.

9. The gender analysis involved[9]: (i) a comprehensive desk study or literature review to build the context revolving around the national policy guidelines, legal frameworks, and current gender statistics of Project areas[10]. The literature review also contributed in gathering related findings of academic field research and previous similar projects; (ii) structured household survey of project areas to gather individual perspectives of intended project beneficiaries on gender dynamics related to project's thematic areas, risks and opportunities; (iii) targeted focus group discussions (FGD) and consultations to derive information on community settings, operational mechanisms and frameworks, governance measures, community practices on water management and EbA, and, social, environmental risks from intended project activities. In addition, exact project sites and locations were visited, where it was necessary, for field observations.

[9] Updated Gender Guidance Document for Implementing Entities on Compliance with the Adaptation Fund Gender Policy, 2022, Para 26..

[10] Updated Gender Guidance Document for Implementing Entities on Compliance with the Adaptation Fund Gender Policy, 2022, Para 24.

1.4 Analytical Framework of Gender Analysis and Development of Gender Action Plan (GAP)

10. The Gender Analysis and development of GAP framework

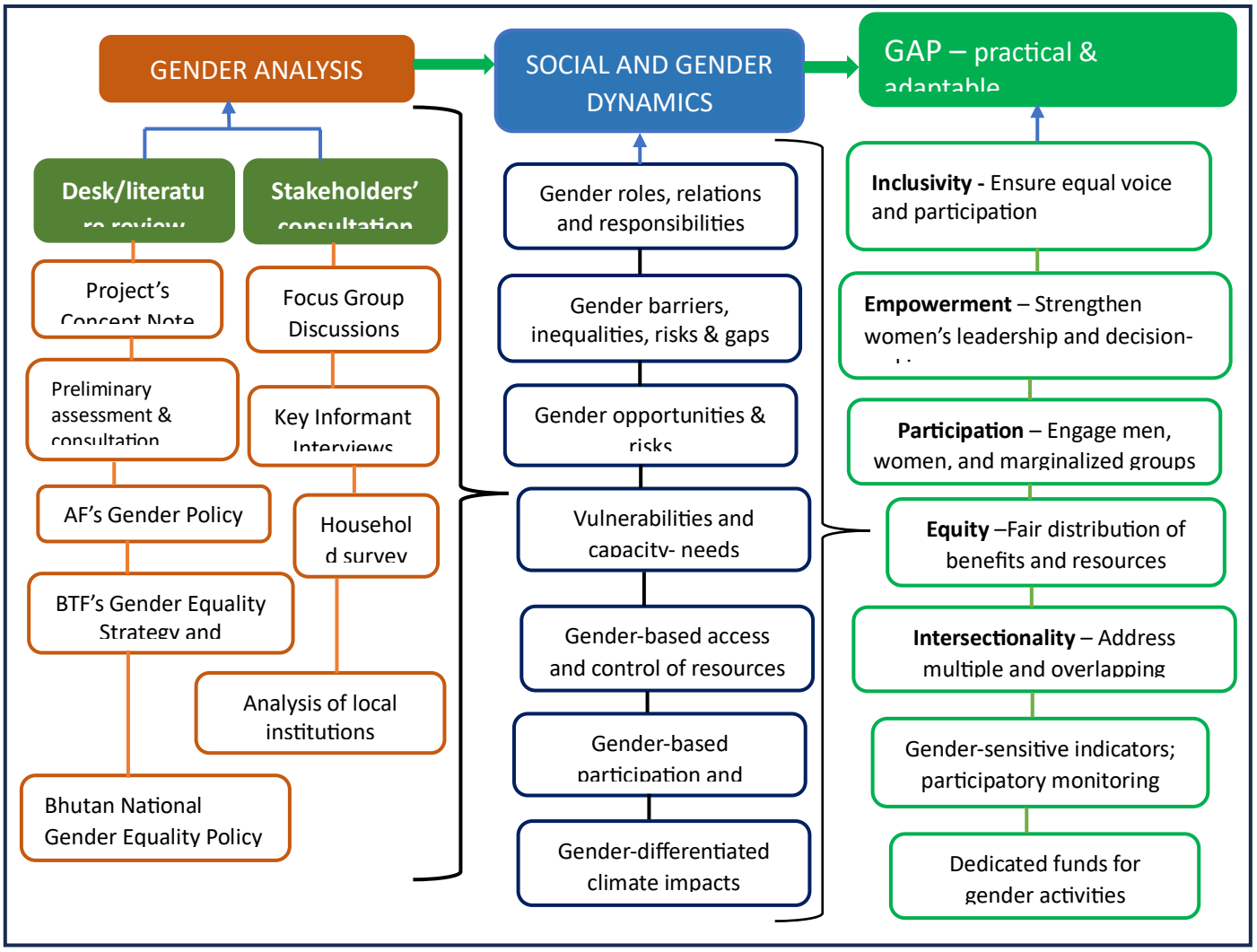


Figure 1: Visual diagram of GAP development process steps

2. GENDER EQUALITY AND, ENVIRONMENT AND CLIMATE CHANGE POLICY AND LEGAL FRAMEWORK

2.1 Gender Equality Promotion and Gender Mainstreaming Policy Guideline of Bhutan

11. All Bhutanese citizens are guaranteed the right to life, liberty and adequate livelihood security with legal protection from discrimination on the grounds of race, sex, language, religion, politics or other status[11]. Any act of 'abuse of women' is prohibited and all citizens have the fundamental duty to take necessary

[11] *Article 7 (Fundamental Rights)* of the Constitution of the Kingdom of Bhutan 2008

steps to prevent such acts[12]. The state has the mandate to ensure a good quality of life for the people of Bhutan in a process that is just, fair, transparent and expeditious, enabled by policies that minimise inequalities of income or concentration of wealth in a few, while promoting equitable distribution of public facilities among individuals and people. Such state policies must promote equal right as well as favourable conditions of work, vocational guidance and training, fair and reasonable remuneration for one's work with elimination of all forms of discrimination and exploitation against women including abuse, violence, harassment and intimidation at work[13].

12. The *National Gender Equality Policy of Bhutan (NGEP) 2020* recognises the inherent linkage of gender equality to sustainable development. The policy maintains that Bhutan embraces gender equality practice by providing equal opportunities for women and men and, boys and girls to benefit equitably from the country's social, economic and political development without limitations based on gender stereotypes and discrimination[14]. Within the framework of the Constitution and other international conventions[15], the country intends to achieve substantive gender equality through gender responsive policies, plans and programmes beyond the formal approach to gender equality[16]. This promotes the premise that improving women's participation and leadership in decision-making (like men's) is aligned with the overall development and good governance principles, so that all individuals can engage and be part of the development of the country. Greater engagement and contribution of women in the social and economic domain will directly contribute to the country's development and productivity, which will augment the progress of sustainable economic growth. Women's and girls' equal access to and participation in education and training are a prerequisite to their engagement in formal employment.

[12] *Article 8 (Fundamental Duties)* of the Constitution of the Kingdom of Bhutan 2008.
[13] *Article 9 (Principles of State Policy)* of the Constitution of the Kingdom of Bhutan 2008.
[14] *National Gender Equality Policy (NGEP) 2020*, National Commission for Women and Children, Royal Government of Bhutan (RGoB).
[15] Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW); Beijing Platform for Action (BPfA); Sustainable Development Goals (SDGs); Universal Declaration on Human Rights, the UN Charter and other regional and international conventions and agreements.
[16] '**Formal approach to equality'**, is based on the understanding and treatment of men and women as similar or the same, and gender equality measures are limited to providing same treatment, platform or opportunities. '**Substantive gender equality**' considers gender equality and mainstreaming measures based on the biological, social and cultural differences between men and women, including social perceptions and their impact on women. The CEDAW Committee's General Recommendations 25 states that "it is not enough to guarantee women the treatment that is identical to that of men. A purely formal legal approach is not sufficient to achieve *women's de facto equality* with men, which is substantive equality.

2.2 National Environment and Climate-Change Policy Guideline and Legal Framework

13. Bhutan's commitment in addressing the impacts of climate-change is reflected in the *Constitution*[17], policies[18], legal instruments[19], international commitments[20], and strategies[21]. These policy guidelines, legal instruments and strategic frameworks are implemented in a manner that foster collaboration, inclusivity, and innovative approaches, with active participation of public and communities to collectively address the common interests of enhancing climate resilience.

14. Every Bhutanese is a trustee of the country's natural resources and environment, with a fundamental duty to protect and prevent environmental and ecological degradation through the adoption of environment friendly practices and policies[22]. The Constitution mandates the Government to secure an ecologically balanced sustainable development[23] by promoting those circumstances that would enable the citizens to secure an adequate livelihood, particularly in the event of a lack of adequate means of livelihood with reasons beyond one's control[24]. Further, the Constitution ensures the decentralisation and devolution of power and authority to the elected Local Governments (LG) for people's direct participation in the development and management of their own social, economic and environmental well-being[25].

15. The *Climate Change Policy of Bhutan (CCPB) 2020* provides a policy guideline and road-map for Bhutan's efficient and effective climate change adaptation and resilience building. The policy calls for not only tackling the challenges posed by climate-change, but also seeks to leverage the opportunities through international collaboration in financial support, technological needs, capacity building and research on climate change at both the national and local levels. The policy emphasises safeguarding of Bhutan's environmental heritage and contribution to global endeavours in combating climate change impacts for a climate resilient future, through an active participation of public and private sectors.

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[17] Article 5 (Environment), Article 8 (Section 2), Article 9 (section 11, 20 & 22), Article 22 (section 1)of the *Constitution of the Kingdom of Bhuta, 2008*.
[18] *Climate Change Policy of the Kingdom of Bhutan, 2020; Water policy of Bhutan 2007.*
[19] *Biodiversity Act of Bhutan, 2003*; *Disaster Management Act of Bhutan, 2013*; *Environmental Assessment Act of Bhutan, 2000*; *Forest and Nature Conservation Act of Bhutan, 1995*; *Land Act of Bhutan, 2007*; *Livestock Act of Bhutan, 2001*; *Local Government Act of Bhutan, 2009*; *National Environment Protection Act of Bhutan, 2007*; *Water Act of Bhutan, 2011*, among others.
[20] Commitment to remain carbon neutral (UNFCCC COP1 in 2009 and reaffirmed in UNFCCC COP21 in 2015).
[21] Nationally Determined Contribution; National Adaptation Plan (NAP) 2023; National Environment Strategy (NES) 2020-2030.
[22] Article 5, Section 1 and Article 8, Section 2 of the Constitution of the Kingdom of Bhutan 2008.
[23] *Article 5, Section 2(c)* of the Constitution of the Kingdom of Bhutan 2008.
[24] *Article 9, Section 11 and 22* of the Constitution of the Kingdom of Bhutan 2008.
[25] *Article 22 (section 1)* of the Constitution of the Kingdom of Bhuta, 2008.

16. The country's *National Environment Strategy (NES) 2020-2030* further upholds mainstreaming environmental and ecological conservation along the economic development progress of the country. The strategy translates CCPB's requirement to maintain carbon neutrality, practising environment-friendly and climate-resilient infrastructure development, and foster sustainable and climate-resilient agricultural practices. In addition, the *National Adaptation Plan (NAP)* adopted in 2023 provides specific guidance on climate change adaptation with clear priorities aimed at reducing exposure and vulnerability to climate-related hazards and enhancing adaptive capacity.

2.3 AF's Gender Policy and Gender Equality Strategy Framework (GESF) of NIE-Bhutan Trust Fund for Environmental Conservation (BTF)

17. The AF upholds that climate change affects women and men differently, with the women's vulnerability being more than men due to gendered roles, responsibilities, access to resources, and decision-making power. Thus, the Fund maintains that its programmes and projects ensure: provision of equal opportunities for women and men; address differentiated vulnerabilities and enhance the adaptive capacity of women, men, girls and boys separately; mitigate gender-related risks ("do no harm") in funded adaptation actions; proactively reduce gender gaps and power imbalances that limit women's participation and benefits ("do good"); advance women's leadership and meaningful participation in decision-making at all stages of project design, implementation, monitoring and evaluation; and, accelerate learning on effective gender-equal adaptation practices and share gender-related knowledge and lessons[26]. The Fund considers gender equality as an essential factor to sustainable, people-centered adaptation outcomes, and asserts systematic integration of gender across all stages of the project cycle—from concept and design to implementation, monitoring and evaluation. The Fund's gender policy requires all AF's projects to identify gender-differentiated needs and risks, ensuring that women and men have equitable access to the Project's benefits, resources and decision-making platforms.

18. Similarly, BTF regards gender inclusion and gender considerations as essential part of its projects' environmental and social safeguards. BTF recognises that men and women are bound by distinct socio-economic roles, responsibilities and opportunities. Gender relations influence how households and communities are organized, based on which decisions to access, control and management of resources are made differently, giving rise to gender differences in vulnerability and adaptation ability. Compared to men, women are affected differently, and often more severely by climate change and associated natural disasters. Therefore, it is necessary to reduce gender inequality through gender mainstreaming so that adaptation needs based on the diverse roles and needs of women and men are treated equitably. In this respect, it requires its projects to incorporate gender equality throughout the project's design and implementation, so that both women and men participate meaningfully and equitably[27]. It mandates all projects funded through international climate finance mechanisms (like Green Climate Fund and AF) to carry out a preliminary gender assessment and develop gender action plans with identification of gender

[26] AF's *Gender Policy 2021*; https://www.adaptation-fund.org/wp-content/uploads/2016/04/OPG-Annex-4_GP-and-GAP_approved-March2021pdf-1.pdf

[27] *Gender Equality Strategy Framework 2016*, BTF.

gaps and proposal of gender-responsive interventions to ensure that project interventions benefit women and vulnerable groups and address gender-differentiated constraints.

2.4 Context of Gender Mainstreaming, Gender Gaps and Issues

19. Gender equality is important for inclusive and holistic development and that the adaptative capacity of both women and men are equally important for communities' resilience to climate-change impacts. Studies have pointed out that women are more vulnerable than men to the impacts of climate change due to multiple factors, such as social structures and norms, as well as economic opportunities (Bhadwal et al., 2019; Goodrich, 2019). Women's vulnerability is intensified by their limited access to information, lack of mobility and decision-making power, as well as their limited financial resources and capacity-building training.

20. Gender differences exist in climate-change vulnerability, participation in decision-making and action on climate adaptation, and benefit sharing[28]. Climate change increases women's workload more than that of men's, making women to experience a decrease in household income, and changes in household food habits and the natural resources they depend on. The deteriorating working conditions due to climate-change constrain women's potential to improve their adaptive capacity in the long run.

21. The Bhutan's NGEP 2020 notes that despite guarantees of formal equality, structural and cultural norms continue to pose barriers to the broader realisation of sustentative gender equality in Bhutan. Most of the existing policies have minimal reference to gender equality interventions, and does not seek to address gender concerns, leaving such policies gender neutral or gender blind. Ad-hoc gender considerations across laws, policies, programmes and projects, often with lack of adequate accountability and monitoring approaches, make gender mainstreaming uneven and non-realistic.

22. Gender stereotypes and prejudices based on socio-cultural norms and practices pervade across the economic sectors in which men and women are employed, making the need to strengthen gender sensitisation and awareness high. Gender stereotypes based on cultural norms, structural barriers and societal attitudes combined with implementation challenges shape gender roles that limit substantive equality, particularly constraining women's public representation, participation and protection, and

[28] *Gender and Climate Change in Bhutan with a Focus on a Nationally Determined Contribution Priority Areas: Agriculture, Energy and Waste, 2020*, NCWC.

partaking in leadership roles[29]. Empirical evidence suggests a need of gender-responsive data systems, tailored interventions, and empowerment practices to translate policy intent into measurable outcomes.

23. According to the Labour Force Survey Report of Bhutan 2024, the rate of women's employment in regular paid jobs (24.6%) is lower than men (39.8%), with the rate also being lower in both urban (54.2% against men's 64.2%) and rural areas (11.4% against men's 26.0%)[30]. Women's substantial engagement is in the agricultural sector (52.5% against 34.8% of men), with a more pronounced gap between women and men's engagement in agriculture found in the rural areas (73.6% of women and 52.1% of men)[31]. This data shows that even in rural areas, women's engagement in unpaid family farms and subsistence agriculture is more than men, who appears to be engaged in non-farm works. Although, women perform unpaid care works (71%) that is 2.5 times more than men, they are unrecognised and remain invisible in the policies, programmes and projects, particularly in terms of the potential negative impacts associated to their engagement for a living[32].
24. Despite being disproportionally affected, women speak out to a lower degree in climate projects at local level[33]. Women face a wide range of challenges to participate and perform at the same level as men. These challenges ranges from skewed social norms and feminisation of agriculture to poor access to and control of resources such as finance, training, technologies and user-friendly equipment. Remoteness and limited facilities in remote areas also impedes women's capability and efficiency in climate adaptation in agricultural works. Considering the rugged terrain of the country, certain equipment and machineries are not easily available. An ICIMOD/FAO report suggests that a range of new and inexpensive agriculture machinery, adapted to local conditions, could potentially enhance labour productivity, reduce work burden and drudgery, and enable women to gain new skills and knowledge that can transform rural gender relations and reduce inequalities[34].

25. The specific gender equality requirements include, but not limited to the following[35]:

    - Creation of an enabling environment to increase the participation of women, with an inclusive lens, in decision-making in the workforce.

[29] *Gender Equality in Public Administration in Bhutan: In-depth Review of Measures for Promoting the Presence and Leadership of Women in Public Administration in Bhutan 2023*, UNDP, UNDESA and NCWC.
[30] *2024 Labour Force Survey Report of Bhutan*, National Statistics Bureau. https://www.nsb.gov.bt/wp-content/uploads/dlm_uploads/2025/03/2024-LFS-report.pdf
[31] Ibid.
[32] *Accounting for unpaid care work in Bhutan 2019*, National Commission for Women and Children, RGoB.
[33] *Bhutan Gender Report for RNR and LGs* 2022, EU Technical Assistance Support Project.
[34] ICIMOD/FAO, 2021.
[35] NGEP 2020

- Exploring and adoption of affirmative and targeted actions to improve women's representation in the social, economic and public sphere at the national and local levels, including for those with disabilities.
- Continuation of advocacy and awareness programmes to encourage women's participation in decision-making and showcasing role models who highlight women's contributions to society.
- Developing and implementation of evidence-based interventions to address gender issues faced by women and girls due to their varying vulnerabilities, particularly those related to employment.
- Mainstreaming gender in all disaster and climate change related initiatives by acknowledging the differential impacts of disasters and climate change on women and men, and highlight the positive roles women can play in adaptation and mitigation efforts.
- Creation of an ecosystem, such as improving gender-friendly infrastructure and facilities in rural areas, that encourages women's participation in the formal economy and enable them to recognise their contribution in the informal segment of the economy.
- Enhancing access to finance and market opportunities.
- Providing capacity and skills development support for women, including rural and socio-economically disadvantaged women.
- Implementation of interventions to increase women's employment in underrepresented sectors based on a detailed situational analysis

3. THIMPHU'S DEMOGRAPHIC AND WATER STATISTICS

3.1 Overview of Thimphu's Demographic Statistics

26. Thimphu's population (including the population of municipality and town) is 138,736 out of which 66,214 or 47.7% are female[36]. The Thimphu's urban population[37] (PHCB 2017) is 115,517 with 56,064 or 48.5% females. As the most urbanized (~83%) district of the country, the higher urban population is attributed to migration for labour, education and employment from other districts of the country. The rural population is 23,219 with 10,150 or 43.7% females. While the rural areas have a slightly higher male skew, urban areas comprise of more balanced male and female population, suggesting family-based and settled populations.

Table 1: Population of Thimphu Dzongkhag by gender, Gewog, Urban/Rural, and Project Gewogs (excluding tourists/non-Bhutanese)

[36] The Population and Housing Census of Bhutan 2017 (PHCB 2017).
[37] Municipality + other designated urban areas.

	Number of Persons			Sex Percent			
Gewog/Town	Male	Female	Total	Male %	Female %	Total %	Sex Ratio
THIMPHU	**72,522**	**66,214**	**138,736**	**52.3**	**47.7**	**100.0**	**110**
Urban	**59,453**	**56,064**	**115,517**	**51.5**	**48.5**	**100.0**	**106**
Thimphu Thromde	58,996	55,555	114,551	51.5	48.5	**100.0**	106
Khasadrupchu Town	457	509	966	47.3	52.7	**100.0**	89.8
Rural	**13,069**	**10,150**	**23,219**	**56.3**	**43.7**	**100**	**128.8**
Kawang	3,185	2,292	5,477	58.2	41.8	100	139
Lingzhi	276	214	490	56.3	43.7	100	129
Naro	163	87	250	65.2	34.8	100	187.4
Soe	101	81	182	55.5	44.5	100	124.7
Chang	3,801	2,951	6,752	56.3	43.7	100	128.8
Darkarla	1,387	707	2,094	66.2	33.8	100	196.2
Ge-nyen	597	544	1,141	52.3	47.7	100	109.7
Maedwang	3,559	3,274	6,833	52.1	47.9	100	108.7
Source: Compiled based on Table A2.1 of Population and Housing Census of Bhutan (PHCB) 2017, Thimphu.							

27. The population projections for 2027 shows slightly more females than men in urban areas of Thimphu, while the rural population maintains the same male skew. The population projection of Thimphu in 2047 shows higher females (51%) than men (49%) when population of urban and rural areas are combined. It shows that the number of females in the peri urban areas, i.e the project areas, will increase.

Table 2: Projected population of Thimphu Dzongkhag by place of residence and gender

Year 2027								
Urban			***Rural***			**Total Dzongkhag**		
Male	Female	Total	Male	Female	Total	Male	Female	Total
72,196	72,221	144,417	19,087	16,131	35,218	91,283	88,352	179,635
Rural male and female %			*54.2*	*45.8*	*100.0*			
Year 2047								
Urban			***Rural***			***Total Dzongkhag***		
Male	Female	Total	Male	Female	Total	Male	Female	Total
						129,672	133,481	263,153
					Rural male and female %	*49*	*51*	*100*
Source: Compiled based on Table 2, 3 & 4 of Dzonkghag Population Projections 2017-2027, and Table 4.12 of Population Projections for Bhutan 2017-2047, NSB, Bhutan.								

28. The most notable characteristic of Thimphu's population is the prevalence of 23.7% female-headed rural households compared to the urban female-headed household of 14%[38]. The rural female-headed

[38] *Bhutan Household Consumption and Expenditure Survey (HCES) 2025*, NSB, RGoB.

households also have a higher number of persons (3.7 persons) than that of urban female-headed households (3.4 persons). **This data translates to the rural Gewogs experiencing male out-migration to urban and peri-urban areas of Thimphu, leaving the women in rural areas as a de-facto household head shouldering the brunt of household livelihood responsibilities while at the same time having to face with increased burden of climate-change impacts**. **While this scenario portrays higher involvement of women in decision-making, existence of structural and cultural gender barriers that could affect women's engagement needs to be considered**. **This data also indicates women's involvement in rural farming and agricultural activities more than men, showing the prevalence of feminisation of agriculture, and, therefore, the more likelihood of women in agriculture sector being impacted by climate-change**. Although feminisation of agriculture may be seen as a positive opportunity from the point of women's opportunity to engage, participate and benefit-sharing, **it would also mean that women have more risks of being exposed to climate threats**.

29. The total population of the five Project Gewogs, including Khasadrupchu local areas (town) is 23,263 with 10,277 or 44% females. The peri-urban zones like Chang, Kawang and Maedwang Gewogs host spillover population of Thimphu municipality. All Gewogs as well as the Khasasrupchu town have slight male skew, with Dakarla having the least female population**. The population data indicates that women could suffer from risks of male-dominance in participation and decision-making, in addition to women shouldering the burden of climate-change impacts due to gendered roles. This suggests for a need to consider targeted gender equality and women empowerment activities during the project period**.

Table 3: Population by of project areas at the Gewog/town levels by gender

KAWANG	**Male**	**Male %**	**Female**	**Female %**	**Total**
Boegarna_Dodennang	296	65	161	35	457
Chhamina_Chhokhor	248	63	146	37	394
Dazhi-Zhoshuel	1,244	48	1,349	52	2,593
Chhangdagang_ Chhoekhortse_ Phajoding	820	68	388	32	1,208
Kuzhugchen	577	70	248	30	825
All Chiwogs of Kawang	***3,185***	***58***	***2,292***	**42**	***5,477***
CHANG	**Male**	**Male %**	**Female**	**Female %**	**Total**
Ramtoktok_Tsangrina	506	53	457	47	963
Yoeselpang	448	55	372	45	820
Lhoongtsho_Tashigang	521	55	428	45	949
Gangchhe_Talakha	1331	58	983	42	2314
Changyokha-Debsid	995	58	711	42	1,706

All Chiwogs of Chang	***3,801***	**56**	***2,951***	**44**	**6,752**
DARKARLA	**Male**	**Male %**	**Female**	**Female %**	**Total**
Wangdrog	11	61	7	39	18
Doongdrog	29	63	17	37	46
Gyaltala	15	47	17	53	32
Chamgang Toed	229	51	223	49	452
Chamgang Maed	1,103	71	443	29	1,546
All Chiwogs Dakarla	***1,387***	**66**	***707***	**34**	***2,094***
GENYEN	**Male**	**Male %**	**Female**	**Female %**	**Total**
Tsho-chekha_Zamtog	65	48	71	52	136
Ge-nyenkha	58	47	66	53	124
Wangbama	298	53	261	47	559
Chizhi	94	75	32	25	126
Zang-legkha	82	42	114	58	196
All Chiwogs of Genyen	***597***	**52**	***544***	**48**	***1,141***
MAEDWANG	**Male**	**Male %**	**Female**	**Female %**	**Total**
Tsha-loong-na	127	50	129	50	256
Jiminang	1617	56	1295	44	2912
Danglo-Namsaeling	721	53	641	47	1,362
Khasadrupchhu	550	49	572	51	1,122
Sisinang	544	46	637	54	1,181
All Chiwogs of Maedwang	***3,559***	**52**	***3,274***	**48**	***6,833***
KHASADRUPCHHU	**Male**	**Male %**	**Female**	**Female %**	**Total**
Local Area 1	289	49	304	51	593
Local Area 2	168	45	205	55	373
All Local Areas of Khasadrupchhu	***457***	47	***509***	53	***966***
Total of Gewogs/Thimphu (Rural)	**12,529**	56	**9,768**	44	**22,297**
Total Project areas	**12,986**	**56**	**10,277**	**44**	**23,263**
Source: Compiled based on Table A2.7 of Population and Housing Census of Bhutan (PHCB) 2017, Thimphu.					

30. Some Chiwogs of the project areas (Chhangdagang, Wangdrog, Chamgang Maed and Chizhi) have strong male skew, indicating the **risks of complete male dominance in participation, decision-making and access to resources or opportunities**. On the other hand, Genyenkha, Zanglegkha and Khasadrupchhu have female skew, like the Khasadrupchhu town areas. **This data suggests a targeted gender-equality sensitisation and trainings for the two clusters of Chiwogs : gender-equality and women's empowerment sensitisation for the first cluster of Chiwogs; and, building women's capacity in climate-change impacts and participation in water governance management in the second cluster of Chiwogs due to more women's exposure to climate-risks.**

Table 4: Population of project areas at Chiwog level by gender

KAWANG	Male	Female	Total
Chhangdagang_ Chhoekhortse_ Phajoding	820	388	1,208
Project Chiwogs and Gewog level	**820**	**388**	**1,208**
CHANG	**Male**	**Female**	**Total**
Ramtoktok_Tsangrina	506	457	963
Project Chiwogs and Gewog level	**506**	**457**	**963**
DARKARLA	**Male**	**Female**	**Total**
Wangdrog	11	7	18
Doongdrog	29	17	46
Chamgang Toed	229	223	452
Chamgang Maed	1103	443	1546
Project Chiwogs and Gewog level	***1,372***	***690***	***2,062***
GENYEN	**Male**	**Female**	**Total**
Ge-nyenkha	58	66	124
Chizhi	94	32	126
Zang-legkha	82	114	196
Project Chiwogs and Gewog level	**234**	**212**	**446**
MAEDWANG	**Male**	**Female**	**Total**
Danglo-Namsaeling	721	641	1362
Khasadrupchhu	550	572	1122
Project Chiwogs and Gewog level	**1271**	**1213**	**2484**
KHASADRUPCHU	**Male**	**Female**	**Total**
Local Area 1	289	304	593
Local Area 2	168	205	373
All Local Areas of Khasadrupchhu	***457***	***509***	***966***
Total of Project Chiwogs	***4,203***	***2,960***	***7,163***
Total Project beneficiaries	***4,660***	***3,469***	***8,129***
Source: Compiled based on Table A2.7 of Population and Housing Census of Bhutan (PHCB) 2017, Thimphu.			

3.2 Source of Drinking Water, Distance from Sources and, Water Reliability

31. All the project areas have piped water inside their dwelling for their drinking water, while a reasonable number of households still do not have piped water inside their dwelling. Use of piped water outside the dwelling is almost equal or slightly higher in Dakarla and Ge-nyen Gewogs. Households using protected well/spring as source of drinking water is higher in Kawang, Chang and Maedwang Gewogs, while the Dakarla Gewog has higher number of households with unprotected springs/rivers/pond as their source of drinking water. **This data indicates a need for a targeted activities for the Gewogs that do not have piped water outside the dwelling, use spring as the drinking water source, and those households that depends on unprotected spring/rivers/ponds for their drinking water. The targeted activities should prioritise empowerment of women, due to the gendered roles making women to be involved in collection and use of household water more than men.**

Table 5: Distribution of Households by Main Source of Drinking Water by Gewog/Town

Gewog/Town	Main Source of Drinking Water						Total
	Piped water Inside the Dwelling	Piped Water Outside the Dwelling	Protected Well/ Protected Spring	Rain Water Collection	Unprotected Well/Spring/ Rivers/ Streams/Lake/ Pond/Dam	Other	
Khasadrupchhu Town	168	68	0	0	0	0	236
Kawang	749	551	12	0	4	0	1,316
Chang	890	541	8	9	2	3	1,453
Darkarla	165	163	0	0	15	1	344
Ge-nyen	102	133	1	0	1	0	237
Maedwang	875	613	11	2	0	4	1,505
Source: Compiled based on Table A7.10 of Population and Housing Census of Bhutan (PHCB) 2017, Thimphu.							

32. Most households in the project areas have their water source within less than 30 minutes. However, the water sources for a few households are located at a further distance of 30 minutes or more, with Ge-nyen Gewog having maximum number of households with their water source at a distance of one-to-two hours. Kawang, Chang, Maedwang and Ge-nyen also have households with their water sources that takes more than two hours.

Table 6: Distribution of Households by Time Taken to Reach the Nearest Water Source by Gewog/town

Gewog/Town	Distance of Household to Water Source					
	Less Than 30 Minutes	30 Minutes - 1 Hour	1 - 2 Hours	More Than 2 Hours	Not Reported	Total
Khasadrupchhu Town	234	0	0	2	0	236
Kawang	1,283	10	13	10	0	1,316
Chang	1,385	49	8	9	2	1,453
Darkarla	342	1	1	0	0	344
Ge-nyen	207	0	23	6	1	237
Maedwang	1,476	9	12	7	1	1,505
Source: Compiled based on Table A7.11 of Population and Housing Census of Bhutan (PHCB) 2017, Thimphu.						

33. Although most residents of the project areas said their source of drinking water is reliable, a reasonable number of residents under Kawang, Chang Maedwang also said their water source is not reliable, indicating a need to understand its implications on women and men, and implement measures to minimise the negative impacts.

Table 7: Distribution of Households by Reliability of Source of Drinking Water by Gewog/Town

Gewog/Town	Reliability of Source of Drinking Water			
	Yes	No	Not Reported	Total
Khasadrupchhu Town	214	22	0	236
Kawang	1,131	185	0	1,316
Chang	1,221	230	2	1,453
Darkarla	295	49	0	344
Ge-nyen	184	53	0	237
Maedwang	1,293	212	0	1,505
Source: Compiled based on Table A7.12 of Population and Housing Census of Bhutan (PHCB) 2017, Thimphu.				

4. CONSULTATION ANALYSIS AND FINDINGS

4.1 Consultation Participants' Profile

34. The focus group consultations in the project areas - four Gewogs and Khasadrupchhu town areas – involved a total of 170 participants. They included relevant Gewog administration officials (both appointed and elected), RNR agents, WUA members, farmers' group members, and community members who are direct beneficiaries of the project activities in the respective project areas. The female participation was 45%.

Table 8: Community consultation participants by Gewog and gender

Gewog	**Date**	**Gender**		**Total**	**Female %**
		Male	**Female**		
Ge-Nyen	13-Jul-26	21	11		
Maedwang	14-Jul-26	35	27		
Chang	15-Jul-26	7	11		
Dakarla	16-Jul-26	21	21		
Kawang	17-Jul-26	9	7		
Total		**93**	**77**	**170**	**45**

35. Despite a reasonable number of female participants in the community group consultations, the discussions and issues of consultations were dominated by men, and women were found to be a passive listener, or generally dependent on men's views and ideas. The consultation process recorded the women participants not willing to engage in the consultations as much as men did.

36. Nevertheless, women in leadership positions and roles in Gewog administration office of the project

Gewogs is encouraging, and represents a strength to drive gender equality and promotion of women in LG and community level.

37. Although consultations in all Gewogs reported gender-equality and absence of any gender issues, deeper discussions revealed gender-equality was translated to mean gender-neutrality. The demographic statistics and other social indicators revealed prevalence of stereotypes, structural barriers, social beliefs and practices that resulted into gendered roles that risks gender-inequality. The detailed stud on such situation was incorporated in the household survey, and discussed in the following sections.

4.2 Profile of Household (HH) Survey Respondents

38. The household (HH) survey recorded a total of 231 responses out of the target of 347 households (30% of total of 1,157 HH estimated in the project areas), representing 62% of the survey target and 20% of the total HHs in the project areas. Out of these, 138 respondents (60%) were females.

Table 9: HH survey respondents by Gewog and Gender

Gewog	Female	Male	Total	% by Gewog
Chang	7	8	**15**	6%
Dakarla	7	4	**11**	5%
Ge-Nyen	47	13	**60**	26%
Kawang	39	35	**74**	32%
Meadwang	38	33	**71**	31%
Toal	**138**	**93**	**231**	**100%**
Percentage	**60%**	**40%**		

Kawang Gewog had the highest number of survey respondents (32%), followed by Maedwang (31%) and Ge-nyen (26%) Gewogs. Except for Chang Gewog, all other four Gewogs have female skews, with **Gen-Nyen Gewog recording the strong female skew.** The gender representation in other four Gewogs of Chang, Dakarla, Kawang and Maedwang are almost balanced. **Women's high representation in Gen-yen Gewog and the overall survey indicates more women's involvement in community activities as well as their exposure to climate-change impacts and water use/management**.

39. The mean age of survey respondents is 46 years, with just 3% under 25 years, and 9% being above 65 years. **This data means that the perceptions of youths were limited, and project activities, like establishment and strengthening of WUA need to consider youth's (including young girls) for equal access, participation and benefit-sharing.**

Table 10: HH Survey respondents by Gewog and Age

Chang			
18-25	0	0	**0**
26-35	2	0	**2**
36-45	3	2	**5**
46-55	2	4	**6**
56-65	0	1	**1**
66-75	0	1	**1**
75 +	0	0	**0**
	7	**8**	**15**

Dakarla			
18-25	0	1	**1**
26-35	2	1	**3**
36-45	3	1	**4**
46-55	1	1	**2**
56-65	1	0	**1**
66-75	0	0	**0**
75 +	0	0	**0**
	7	**4**	**11**

Ge-Nyen			
18-25	4	0	**4**
26-35	12	0	**12**
36-45	10	4	**14**
46-55	11	4	**15**
56-65	7	3	**10**
66-75	1	1	**2**
75 +	2	1	**3**
	47	**13**	**60**

Kawang			
18-25	3	2	**5**
26-35	6	4	**10**
36-45	13	11	**24**
46-55	15	4	**19**
56-65	1	8	**9**
66-75	1	5	**6**
75 +	0	1	**1**
	39	**35**	**74**

Maedwang			
18-25	1	1	**2**
26-35	5	3	**8**
36-45	12	9	**21**
46-55	14	13	**27**
56-65	5	3	**8**
66-75	0	4	**4**
75 +	1	0	**1**
	38	**33**	**71**

40. 79.6% of the survey respondents are married, with more women reporting it than men. **Women also outnumber men in other categories, with strong skew in 'divorced' and 'widowed' category, indicating a need to consider targeted inclusion and participation opportunities in the project activities for their empowerment and equal access to project resources.**

Table 11: Marital status of survey respondents by Gewog and gender

Marital Status	Chang			Dakarla			Ge-Nyen			Kawang			Maedwang			Total		
	F	M	T	F	M	T	F	M	T	F	M	T	F	M	T	F	M	T
Married	5	8	**13**	5	**3**	**8**	35	**13**	**48**	30	**27**	**57**	29	**29**	**58**	104	**80**	184
Single	1		**1**	1	**1**	**2**	3		**3**	6	**7**	**13**	2	**2**	**4**	13	**10**	23
Living Together			**0**			**0**	1		**1**	0	**0**	**0**	1	**2**	**3**	2	**2**	4
Divorced	1		**1**	1		**1**	5		**5**	1	**1**	**2**	4	**0**	**4**	12	**1**	13
Widowed			**0**			**0**	3		**3**	2	**0**	**2**	2	**0**	**2**	7	**0**	7
	7	**8**	**15**	**7**	**4**	**11**	**47**	**13**	**60**	**39**	**35**	**74**	**38**	**33**	**71**	**138**	**93**	**231**

41. There is a fair balance between men and women in education qualification. However, more women than men have 'no education'.

Table 12: Education qualification by Gewog and gender

Education Qualification	Chang			Dakarla			Ge-Nyen			Kawang			Maedwang			Total		
	F	M	T	F	M	T	F	M	T	F	M	T	F	M	T	F	M	T

Primary School	1	1	**2**	0	**1**	**1**	15	**3**	**18**	6	**6**	**12**	12	**5**	**17**	34	**16**	50
High School	3	2	**5**	3	**1**	**4**	1	**0**	**1**	3	**0**	**3**	1	**0**	**1**	11	**3**	14
Bachelor	3	5	**8**	0	**1**	**1**	1	**0**	**1**	13	**11**	**24**	9	**13**	**22**	26	**30**	56
Monastic Education			**0**	2	**0**	**2**	6	**3**	**9**	6	**9**	**15**	9	**8**	**17**	23	**20**	43
Non-formal Edu.			**0**	0	**0**	**0**	6	**1**	**7**	1	**1**	**2**	1	**1**	**2**	8	**3**	11
No education			**0**	2	**1**	**3**	18	**6**	**24**	10	**8**	**18**	6	**6**	**12**	36	**21**	57
Respondents	**7**	**8**	**15**	**7**	**4**	**11**	**47**	**13**	**60**	**39**	**35**	**74**	**38**	**33**	**71**	**138**	**93**	**231**

42. Farming is the dominant occupation (48.9%) with more women (55.5%) than men (38.7%) involved in it. **Since farming is the leading occupation for both sexes, especially women, design and scheduling of implementing the project activities must ensure that women's farm labour calendars are not affected.** There's a tendency of equal increase in self-employment of men and women, indicating outmigration to urban areas for alternative income activities.

Table 13: Occupation of survey respondents by Gewog and gender

Job	**Chang**			**Dakarla**			**Ge-Nyen**			**Kawang**			**Maedwang**			**Total**		
	F	M	**T**	F	**M**	**T**	F	**M**	**T**	F	**M**	**T**	F	**M**	**T**	F	**M**	**T**
Farmer	1	1	**2**	2	**1**	**3**	44	**13**	**57**	11	**6**	**17**	19	**15**	**34**	77	**36**	113
Livestock Herder			**0**	1	**0**	**1**			**0**	0	**0**	**0**	0	**0**	**0**	1	**0**	1
Business (SME,etc)		2	**2**	1	**0**	**1**			**0**	5	**5**	**10**	6	**5**	**11**	12	**12**	24
Self employed	5	3	**8**	1	**3**	**4**	3		**3**	12	**11**	**23**	11	**12**	**23**	32	**29**	61
Unemployed	1	2	**3**	2	**0**	**2**			**0**	11	**13**	**24**	2	**1**	**3**	16	**16**	32
	7	**8**	**15**	**7**	**4**	**11**	**47**	**13**	**60**	**39**	**35**	**74**	**38**	**33**	**71**	**138**	**93**	**231**

43. Most people have lived in the same location of survey all the time or more than fifteen years (**68.4%), indicating rich experience of local systems and adaptation practices, as well as exposure to climate risks and impacts. The data shows that women (**74.5%) **have longer experience of living in the same village than men (**60.2%).

Table 14: Number of years lived in the village by Gewog and Gender

Years	**Chang**			**Dakarla**			**Ge-Nyen**			**Kawang**			**Maedwang**			**Total**		
	F	M	**T**	F	M	**T**	F	M	**T**	F	M	**T**	F	M	**T**	F	M	**T**
1 to 5 years	1	4	5	1	0	1	3	0	3	7	6	13	4	3	7	16	**13**	29
6 to 10 years	0	2	2	0	0	0	2	1	3	2	7	9	6	4	10	10	**14**	24
11 to 15 years	1	0	1	0	1	1	1	1	2	5	7	12	3	1	4	10	**10**	20
More than 15 Yrs or all time	5	2	7	6	3	9	41	11	52	25	15	40	25	25	50	102	**56**	158
	7	**8**	**15**	**7**	**4**	**11**	**47**	**13**	**60**	**39**	**35**	**74**	**38**	**33**	**71**	**138**	**93**	**231**

44. The composition of family members in a household shows a mean size of 2.8 males and 2.9 females on a modal category of 2 to 3 members of both women and men. This indicates equal size and representation

of women and men in the household. This data also suggests a size of coverage of men and women beneficiaries in the project areas.

Table 15: Number of family members in the household by Gewog and gender:

Gewog	Female	Male	Total	Total Household taken
Chang	43	44	**87**	15
Dakarla	33	31	**64**	11
Ge-Nyen	171	178	**349**	60
Kawang	256	261	**517**	74
Maedwang	202	187	**389**	71
Total	**705**	**701**	**1406**	**231**

45. The survey showed 64.94% of households headed by women, and 31.17% households headed by men. This indicates high involvement of women in participation and decision-making activities, **yet it also could suggest that, because of gendered roles in household chores and other unpaid care works shouldered by women, they bear the most burden of family and community activities.**

Table 16: No. of households headed by a woman and man by gender.

Gewog	Woman-headed	Man-headed	Don't know	Total	Total HH taken
Chang	9	6	0	**15**	**15**
Dakarla	6	5	0	**11**	**11**
Ge-Nyen	56	4	0	**60**	**60**
Kawang	35	34	5	**74**	**74**
Maedwang	44	23	4	**71**	**71**
Total	**150**	**72**	**9**	**231**	**231**

46. Most households source their drinking water from a piped HH supply (46.75%) and tapped community water supply (44.58%). A negligible number of households use spring or river (7.35%) and other sources (1.29%). Likewise, most households' irrigation water is sourced from proper irrigation canal system (37.6%) and, a river or spring (33.7%). Dependence on rain water and other sources for irrigation water is low.

Table 17: Source of drinking water

Gewog	Drinking Water Source				
	Piped (HH)	Community Water Supply Taped	Spring or River	Other	Total survey HHs
Chang	3	10	2	0	**15**
Dakarla	4	7	0	0	**11**
Ge-nyen	42	14	3	1	**60**
Kawang	34	36	3	1	**74**
Maedwang	25	36	9	1	**71**
Total	**108**	**103**	**17**	**3**	**231**

Table 18: Source of irrigation water

Gewog	Irrigation Water Source				
	Irrigation channel	River/Spring	Rain Water	Other	Total survey HH
Chang	5	4	1	5	**15**
Dakarla	0	9	0	2	**11**
Ge-nyen	29	7	0	24	**60**
Kawang	15	31	10	18	**74**
Maedwang	38	27	1	5	**71**
Total	**87**	**78**	**12**	**54**	**231**

4.3 Access to Resources, Participation and Decision-making in Household and Community Activities

47. Women take the main ownership of agriculture lands in 48.5% HHs, and agriculture lands of 35.5% of households are owned by both men and women. This maintains consistency with the customary practice of matrilineal land-tenure in western districts of Bhutan. However, irrespective of the differences in ownership of agriculture lands, both men and women are equally engaged in HHs income generation from the agriculture and livestock producers. This suggests that women's higher ownership in agriculture lands does not necessarily correspond to their upper hand in HH income generation.

Table 19: Main ownership of agriculture lands by Gewog and gender

Gewog	Main owner of agriculture Land				
	Woman	Man	Both	Don't know	Total
Chang	5	1	**8**	1	**15**
Dakarla	7	2	**2**	0	**11**
Ge-nyen	41	4	**15**	0	**60**
Kawang	26	10	**34**	4	**74**
Meadwang	33	13	**23**	2	**71**
Total	**112**	**30**	**82**	**7**	**231**

Table 20: Primary earner of income from agricultural and livestock produces by Gewog and gender

Gewog	Primary Earner of income from Agriculture and Livestock produces				
	Woman	Man	Both	Don't know	Total
Chang	3	1	**11**	0	**15**
Dakarla	4	2	**5**	0	**11**
Ge-nyen	10	8	**42**	0	**60**
Kawang	23	11	**31**	9	**74**
Maedwang	18	6	**42**	5	**71**
Total	**58**	**28**	**131**	**14**	**231**

48. Women and men mostly take joint decisions on the management and use of natural resources in all Gewogs. However, there are differences between men and women in decision-making of specific resources. Women largely have upper hand in decision-making on management and use of family land, agriculture seeds/seedlings, expenditure on essential food items, and buying and selling of family land. Likewise, men have largely an upper hand in decision-making on irrigation water and expenditure on non-food items. **These data suggest distribution of workloads between men and women based on gendered roles, and social customs and practices such as the matrimonial rights to head family households, land ownership and land management. This information also indicates that women are involved and capable of leadership roles in the household as well as community activities, if they are provided with equal opportunities and empowerment facilities. Nevertheless, such data could also mean the increase in women's burden due to unequal distribution of household activities, which will affect their engagement and participation in other non-household and income-generating jobs, leisure, recreational activities, etc that have direct implications on their health and wellbeing.**

Table 21: Main decisions made by women and men in management and use of natural resources

Gewog	Expenditure on essential food Supplies				
	Woman	Man	Both	Don't know	Total
Chang	5	2	8	0	15
Dakarla	2	1	8	0	11
Ge-nyen	5	7	47	1	60
Kawang	11	12	49	2	74
Maedwang	17	9	44	1	71
Total	**40**	**31**	**156**	**4**	**231**

Gewog	Irrigation water				
	Woman	Man	Both	Don't know	Total
Chang	1	1	12	1	15
Dakarla	2	9	0	0	11
Ge-nyen	6	7	47	0	60
Kawang	8	9	50	7	74
Maedwang	8	6	51	6	71
Total	**25**	**32**	**160**	**14**	**231**

Gewog	Agriculture seeds and seedlings				
	Woman	Man	Both	Don't know	Total
Chang	6	1	7	1	15
Dakarla	5	2	4	0	11
Ge-nyen	12	3	45	0	60
Kawang	21	4	45	4	74
Maedwang	21	5	43	2	71
Total	**65**	**15**	**144**	**7**	**231**

Gewog	Buying and selling land				
	Woman	Man	Both	Don't know	Total
Chang	2	0	12	1	15
Dakarla	3	1	6	1	11
Ge-nyen	9	6	39	6	60
Kawang	13	9	37	15	74
Maedwang	9	9	41	12	71
Total	**36**	**25**	**135**	**35**	**231**

Gewog	Drinking Water				
	Woman	Man	Both	Don't know	Total
Chang	2	2	11	0	15
Dakarla	1	2	8	0	11
Ge-nyen	5	4	51	0	60
Kawang	11	10	53	0	74
Maedwang	7	8	52	4	71
Total	**26**	**26**	**175**	**4**	**231**

Gewog	Land management and use				
	Woman	Man	Both	Don't know	Total
Chang	3	1	11	0	15
Dakarla	2	2	7	0	11
Ge-nyen	7	3	50	0	60
Kawang	16	15	42	1	74
Maedwang	20	15	35	1	71
Total	**48**	**36**	**145**	**2**	**231**

Gewog	Expenditure on non-food Items				
	Woman	Man	Both	Don't know	Total
Chang	1	3	11	0	15
Dakarla	1	1	9	0	11
Ge-nyen	8	10	42	0	60
Kawang	10	11	51	2	74
Maedwang	14	14	41	2	71
Total	**34**	**39**	**154**	**4**	**231**

49. Time spent by women and men in different HH chores and community activities shows gendered roles with differentiated perspectives between men and women. All women are found to be spending 'a lot of time' in cooking, cleaning house/washing clothes, collecting water/fuelwood, taking care of children, farming/agriculture works, and tending to livestock. Women take slightly less or almost equal time in 'collection of non-wood forest products' and 'local community/project works. On the other hand, all men reported they spend in these activities 'most of the times' or 'sometimes' only, indicating less time they spend in these activities compared to women. At the same time, men are found to spend 'a lot of time' compared to women in collecting non-wood forestry products and local community activities/projects. These data suggest that women are more involved in domestic chores and unpaid care works for the households, indicating that they shoulder more household management burden and workloads, which in turn, reduces their time and opportunities for paid employment opportunities. This data also reveals that men are engaged more in non-household income generating activities, meaning they avail better access and opportunities to paid works. In this regard, project activities should be designed, planned and implemented in a manner that considers women's convenient timing, availability, easy reach and without giving them additional burdens.

Table 22: Time spent by men and women in different household and community activities

Gewog	Sex	Cooking					
		A lot of Time	Most of Time	Some times	Not at all	Total	Total survey HH
Chang	Female	2	3	**2**	0	**7**	**15**
	Male	1	4	**3**	0	**8**	
Dakarla	Female	0	6	**1**	0	**7**	**11**
	Male	1	2	**1**	0	**4**	
Ge-nyen	Female	3	37	**7**	0	**47**	**60**
	Male	1	5	**7**	0	**13**	
Kawang	Female	15	18	**6**	0	**39**	**74**
	Male	6	16	**11**	2	**35**	
Maedwang	Female	12	23	**3**	0	**38**	**71**
	Male	3	13	**17**	0	**33**	
Total	**Female**	**32**	**87**	**19**	**0**	**138**	**231**
	Male	**12**	**40**	**39**	**2**	**93**	

Gewog	Sex	Cleaning the house & washing clothes					
		A lot of Time	Most of Times	Some times	Not at all	Total	Total survey HH
Chang	Female	2	4	1	0	7	15
	Male	2	1	5	0	8	
Dakarla	Female	1	5	1	0	7	11
	Male	0	3	1	0	4	
Ge-nyen	Female	4	27	16	0	47	60
	Male	1	4	8	0	13	
Kawang	Female	14	23	1	1	39	74
	Male	5	13	17	0	35	
Maedwang	Female	14	20	4	0	38	71
	Male	5	10	17	1	33	
Total	Female	35	79	23	1	138	231
	Male	13	31	48	1	93	

Gewog	Sex	Collecting water & fuelwood					
		A lot of Time	Most of Time	Some times	Not at all	Total	Total survey HH
Chang	Female	1	2	3	1	7	15
	Male	0	2	5	1	8	
Dakarla	Female	0	3	4	0	7	11
	Male	1	2	1	0	4	
Ge-nyen	Female	3	12	31	1	47	60
	Male	1	4	8	0	13	
Kawang	Female	5	13	17	4	39	74
	Male	3	6	19	7	35	
Maedwang	Female	6	15	14	3	38	71
	Male	4	5	13	11	33	
Total	**Female**	**15**	**45**	**69**	**9**	**138**	**231**
	Male	**9**	**19**	**46**	**19**	**93**	

Gewog	Sex	Taking care of children					
		A lot of Time	Most of Time	Some times	Not at all	Total	Total survey HH
Chang	Female	2	3	2	0	7	15
	Male	2	1	3	2	8	
Dakarla	Female	2	4	1	0	7	11
	Male	0	2	2	0	4	
Ge-nyen	Female	5	18	22	2	47	60
	Male	1	3	6	3	13	
Kawang	Female	10	20	6	3	39	74
	Male	4	11	16	4	35	
Maedwang	Female	12	16	7	3	38	71
	Male	4	7	18	4	33	
Total	**Female**	**31**	**61**	**38**	**8**	**138**	**231**
	Male	**11**	**24**	**45**	**13**	**93**	

Gewog	Sex	Farming & Agriculture works					
		A lot of Time	Most of Time	Some times	Not at all	Total	Total survey HH

Chang	Female	2	3	**2**	0	**7**	**15**
	Male	2	2	**4**	0	**8**	
Dakarla	Female	0	6	**1**	0	**7**	**11**
	Male	0	1	**3**	0	**4**	
Ge-nyen	Female	2	38	**7**	0	**47**	**60**
	Male	2	9	**2**	0	**13**	
Kawang	Female	11	14	**11**	3	**39**	**74**
	Male	4	11	**18**	2	**35**	
Maedwang	Female	11	18	**5**	4	**38**	**71**
	Male	10	13	**10**	0	**33**	
Total	**Female**	**26**	**79**	**26**	**7**	**138**	**231**
	Male	**18**	**36**	**37**	**2**	**93**	

Gewog	**Sex**	**Tending to Livestock**					
		A lot of Time	**Most of Time**	**Some times**	**Not at all**	**Total**	**Total survey HH**
Chang	Female	0	3	**2**	2	**7**	**15**
	Male	2	2	**4**	0	**8**	
Dakarla	Female	0	6	**1**	0	**7**	**11**
	Male	0	1	**3**	0	**4**	
Ge-nyen	Female	2	38	**7**	0	**47**	**60**
	Male	2	9	**2**	0	**13**	
Kawang	Female	11	14	**11**	3	**39**	**74**
	Male	4	11	**18**	2	**35**	
Maedwang	Female	11	18	**5**	4	**38**	**71**
	Male	10	13	**10**	0	**33**	
Total	**Female**	**24**	**79**	**26**	**9**	**138**	**231**
	Male	**18**	**36**	**37**	**2**	**93**	

Gewog	**Sex**	**Collecting non-wood forest products**					
		A lot of Time	**Most of Time**	**Some times**	**Not at all**	**Total**	**Total survey HH**
Chang	Female	0	0	**5**	2	**7**	**15**
	Male	0	1	**4**	3	**8**	
Dakarla	Female	0	1	**5**	1	**7**	**11**
	Male	1	3	**0**	0	**4**	
Ge-nyen	Female	1	15	**27**	4	**47**	**60**
	Male	0	4	**8**	1	**13**	
Kawang	Female	1	4	**14**	20	**39**	**74**
	Male	1	3	**16**	15	**35**	
Maedwang	Female	1	2	**22**	13	**38**	**71**
	Male	2	3	**10**	18	**33**	
Total	**Female**	**3**	**22**	**73**	**40**	**138**	**231**
	Male	**4**	**14**	**38**	**37**	**93**	

Gewog	**Sex**	**Local community activities/projects**					
		A lot of Time	**Most of Time**	**Some times**	**Not at all**	**Total**	**Total survey HH**
Chang	Female	1	1	**5**	0	**7**	**15**

	Male	3	2	**3**	0	**8**	
Dakarla	Female	1	3	**3**	0	**7**	**11**
	Male	0	2	**2**	0	**4**	
Ge-nyen	Female	2	12	**33**	0	**47**	**60**
	Male	0	5	**8**	0	**13**	
Kawang	Female	2	9	**27**	1	**39**	**74**
	Male	4	4	**25**	2	**35**	
Maedwang	Female	3	14	**21**	0	**38**	**71**
	Male	3	11	**17**	2	**33**	
Total	**Female**	**9**	**39**	**89**	**1**	**138**	**231**
	Male	**10**	**24**	**55**	**4**	**93**	

50. Both women and men seem to be participating in the membership to different groups within the community. However, such memberships are gendered in the degree of involvement and engagement. **The data in the following table shows that men's membership in farmers group is less than women, whereas women's non-membership in community trade and businesses has huge differences. Women's non-membership in WUA, voluntary works and community forest group is higher than men's.**

Table 23: Membership by men and women in different groups

Gewog	Sex	Farmers group			Community Trade/Business			Voluntary			Water user association			Community Forest		
		Yes	No	Total	Yes	No	Total	Yes	No	Total	Yes	No	Total	Yes	No	Total
Chang	Female	5	2	**7**	4	3	**7**	6	1	**7**	7	0	**7**	3	4	**7**
	Male	2	6	**8**	2	6	**8**	6	2	**8**	8	0	**8**	2	6	**8**
Dakarla	Female	1	6	**7**	1	6	**7**	2	5	**7**	3	4	**7**	4	3	**7**
	Male	3	1	**4**	3	1	**4**	2	2	**4**	2	2	**4**	3	1	**4**
Ge-nyen	Female	18	29	**47**	12	35	**47**	11	36	**47**	22	25	**47**	41	6	**47**
	Male	8	5	**13**	3	10	**13**	6	7	**13**	8	5	**13**	10	3	**13**
Kawang	Female	19	20	**39**	10	29	**39**	15	24	**39**	26	13	**39**	19	20	**39**
	Male	10	25	**35**	4	31	**35**	15	20	**35**	28	7	**35**	21	14	**35**
Maedwang	Female	20	18	**38**	9	29	**38**	16	22	**38**	23	15	**38**	14	24	**38**
	Male	14	19	**33**	4	29	**33**	20	13	**33**	26	7	**33**	17	16	**33**
Total	**Female**	**63**	**75**	**138**	**36**	**102**	**138**	**50**	**88**	**138**	**81**	**57**	**138**	**81**	**57**	**138**
	Male	**37**	**56**	**93**	**16**	**77**	**93**	**49**	**44**	**93**	**72**	**21**	**93**	**53**	**40**	**93**
		100	**131**	**231**	**52**	**179**	**231**	**99**	**132**	**231**	**153**	**78**	**231**	**134**	**97**	**231**

4.4 Gender-based climate vulnerability, impacts and access to capacity-building activities

51. A large number of 81% of respondents agree that climate change is affecting their life, and 62.3% agree it is increasing their personal workload (perceptions broadly shared by women and men). **However, whether or not women are affected by climate change impacts more than men, or whether it increases**

women's workloads more than men's are inconclusive. This indicates respondents' lack of knowledge and low awareness of gender-differentiated climate impacts, which suggests a need for sensitisation and capacity-building on gender-based and gender-differentiated impacts of climate change.

Table 24: Opinion on gender-based climate-change impacts and capacity

Gewog	Sex	CC - affect life				CC- impact women more than men				CC increases personal workload				CC increase women's workload more than men			
		Agree	Disagree	Don't know	Total	Agree	Disagree	Don't know	Total	Agree	Disagree	Don't know	Total	Agree	Disagree	Don't know	Total
Chang	Female	7	0	0	**7**	3	1	3	**7**	7	0	0	**7**	3	2	2	**7**
	Male	8	0	0	**8**	4	2	2	**8**	5	1	2	**8**	4	3	1	**8**
Dakarla	Female	7	0	0	**7**	2	3	2	**7**	4	1	2	**7**	2	4	1	**7**
	Male	3	0	1	**4**	0	2	2	**4**	1	1	2	**4**	0	1	3	**4**
Ge-nyen	Female	30	5	12	**47**	18	15	14	**47**	24	7	16	**47**	14	19	14	**47**
	Male	11	0	2	**13**	6	3	4	**13**	9	2	2	**13**	3	5	5	**13**
Kawang	Female	35	1	3	**39**	14	12	13	**39**	25	13	1	**39**	15	13	11	**39**
	Male	26	3	6	**35**	6	10	19	**35**	19	5	11	**35**	8	7	20	**35**
Maedwang	Female	31	2	5	**38**	9	11	18	**38**	22	5	11	**38**	8	13	17	**38**
	Male	30	1	2	**33**	9	10	14	**33**	28	0	5	**33**	12	8	13	**33**
Total	**Female**	**110**	**8**	**20**	**138**	**46**	**42**	**50**	**138**	**82**	**26**	**30**	**138**	**42**	**51**	**45**	**138**
	Male	**78**	**4**	**11**	**93**	**25**	**27**	**41**	**93**	**62**	**9**	**22**	**93**	**27**	**24**	**42**	**93**
		188	**12**	**31**	**231**	**71**	**69**	**91**	**231**	**144**	**35**	**52**	**231**	**69**	**75**	**87**	**231**

52. Participation in the capacity-building sensitisation and training in climate-change, watershed protection, SLM and climate smart agriculture are low across the board. Both women and men reported high 'No' in all these trainings, indicating low knowledge and skills in these relevant areas of the Project's objectives and thematic areas.

Table 25: Participation in the sensitisation and training

Gewog	Sex	CC adaptation			Water/spring shed protection			SLM			Env/natural resources			Climate smart/protect			Gender mainstreaming		
		Yes	No	Total	Yes	No	Total	Yes	No	Total	Yes	No	Total	Yes	No	Total	Yes	No	Total
Chang	F	5	2	**7**	5	2	**7**	4	3	**7**	5	2	**7**	4	3	**7**	5	2	**7**
	M	4	4	**8**	4	4	**8**	2	6	**8**	3	5	**8**	1	7	**8**	4	4	**8**
Dakarla	F	4	3	**7**	5	2	**7**	3	4	**7**	5	2	**7**	4	3	**7**	3	4	**7**
	M	2	2	**4**	1	3	**4**	1	3	**4**	2	2	**4**	0	4	**4**	0	4	**4**
Ge-nyen	F	9	38	**47**	13	34	**47**	10	37	**47**	16	31	**47**	10	37	**47**	12	35	**47**
	M	3	10	**13**	3	10	**13**	4	9	**13**	3	10	**13**	3	10	**13**	5	8	**13**
Kawang	F	12	27	**39**	16	23	**39**	11	28	**39**	16	23	**39**	12	27	**39**	11	28	**39**

	M	12	23	35	17	18	35	14	21	35	17	18	35	14	21	35	16	19	35
Maedwang	F	7	31	38	13	25	38	8	30	38	12	26	38	15	23	38	14	24	38
	M	6	27	33	16	17	33	10	23	33	16	17	33	13	20	33	12	21	33
Total	**F**	**37**	**101**	**138**	**52**	**86**	**138**	**36**	**102**	**138**	**54**	**84**	**138**	**45**	**93**	**138**	**45**	**93**	**138**
	M	**27**	**66**	**93**	**41**	**52**	**93**	**31**	**62**	**93**	**41**	**52**	**93**	**31**	**62**	**93**	**37**	**56**	**93**
		64	**167**	**231**	**93**	**138**	**231**	**67**	**164**	**231**	**95**	**136**	**231**	**76**	**155**	**231**	**82**	**149**	**231**

53. Both men and women reported gender equality and gender-balanced participation is important (**87.4%)** and most of them (**89.2%)** believe that there are equal access and opportunity for both women and men

Table 26: Opinion on importance of participation water, climate-change and NRM with equal access and opportunity.

Gewog	**Sex**	**Gender-balanced participation in water, NRM, and CC**				**Equal access & Opportunity**			
		Important	**Not Important**	**Don't know**	**Total**	**Yes**	**No**	**Don't know**	**Total**
Chang	Female	7	0	0	**7**	6	0	1	**7**
	Male	7	0	1	**8**	8	0	0	**8**
Dakarla	Female	6	0	1	**7**	6	0	1	**7**
	Male	4	0	0	**4**	4	0	0	**4**
Ge-nyen	Female	44	0	3	**47**	46	0	1	**47**
	Male	9	1	3	**13**	10	0	3	**13**
Kawang	Female	30	4	5	**39**	32	1	6	**39**
	Male	31	0	4	**35**	29	1	5	**35**
Maedwang	Female	35	0	3	**38**	35	2	1	**38**
	Male	29	2	2	**33**	30	1	2	**33**
Total	**Female**	**122**	**4**	**12**	**138**	**125**	**3**	**10**	**138**
	Male	**80**	**3**	**10**	**93**	**81**	**2**	**10**	**93**
		202	**7**	**22**	**231**	**206**	**5**	**20**	**231**

5. SYNTHESIS OF FINDINGS AND RECOMMENDATIONS

5.1 Conceptual Rationale of Gender Analysis

54. Gender mainstreaming and gender equality are critical components in community-based and locally led water management and ecosystem-based adaptation (EbA) because water resources and ecosystems directly affect men and women differently due to social roles, responsibilities, and access to resources. Incorporating gender considerations ensures effectiveness, equity, and sustainability.

55. Gender roles and social norms influence how men and women interact, share and benefit from with water resources and EbA strategies. Gender roles based on social and cultural norms and practices have implications on division of labour and workload distribution in water collection, household water management and climate-change adaptation measures. They also affect women's participation in leadership positions/roles, since they influence who performs what kinds of activities.

56. Equal access and control over resources by women and men is important to maintain gender equality and promotion of gender-balanced development. Limited access to the critical livelihood resources based on gender inequality would reduce women's and men's adaptive capacity to climate change.

57. Equal participation in decision-making process strengthens community's governance and effective use of critical local resources. Thus, it is important to provide equal access and opportunity for both women and men to participate and engage actively in the community decision-making forums and processes, including but not limited to water user committees; community forest or ecosystem management groups; and, local adaptation planning processes. Meaningful participation ensures integration of diverse needs and knowledge systems into management decisions.

58. Gender roles and gender inequality expose women and men differently to climate-change impacts and vulnerabilities.
59. Gender equality or integration of gender perspectives into ecosystem-based water management improves water security. strengthens community resilience to climate change, increases women's participation and leadership, enable equitable access to ecosystem services, and upholds sustainable natural resource management.

60. Key strategies for gender mainstreaming, includes:

- Conducting gender analysis in specific project stages to understand gender roles, responsibilities, and vulnerabilities, and to inform gender-balanced and gender-responsive implementation of specific project activities
- Ensuring inclusive participation in planning, decision-making, and monitoring of project activities.
- Providing capacity-building and training opportunities for women/men and marginalized groups.
- Implementing gender-responsive budgeting to address the specific needs of different groups.
- Promotion of women's leadership in local water committees, watershed management, and EbA initiatives.

5.2 Summary of gender status, concerns, gaps and recommendations

61. Gender status, concerns, gaps and recommendations:

Table 27: Gender status, concerns, gaps and recommendations

No.	***Gender status, concerns, and gaps***	***Recommendations***
1.	Male out-migration leaves women as a de-facto household head, shouldering the brunt of household livelihood responsibilities with increased burden of climate-change impacts. Women tend to be involved more in rural farming and agricultural activities, leading to feminisation of agriculture, with more risks of exposure to climate-impacts.	• Design, plan and implement the project activities in a manner that does not further increase women's burden and risks of climate-change impacts. • Carry out assessment and analysis of gender-based implications as part of the design and planning of project activities to inform gender-responsive and gender-balanced strategies of implementation. • Involve women in designing, planning and implementation of project activities to consider their adaptation needs. • Schedule implementation of project activities corresponding to women's maximum participation without implicating their gendered roles and responsibilities. • Promote use of gender-friendly tools and mechanised machinery.
2	Male skews in rural population (eg. Chhangdagang, Wangdrog, Chamgang Maed and Chizhi) leaves room for male-dominance in participation, decision-making and access to resources/opportunities.	• Provide gender-equality sensitisation and awareness programmes targeted at Chiwogs with male or female skews. Gender-equality and women's empowerment sensitisation for Chiwogs with male skews, women's capacity-building women's programmes on climate-change impacts adaptation strategies and participation in water governance.

	Likewise, some other Chiwogs (Genyenkha, Zanglegkha and Khasadrupchhu) have female skew, risking women's exposure to adverse climate-change impacts.	
3	Low participation of youths in the consultations as well as HH survey, due to which their perceptions could not be incorporated in the analysis, risking their exclusion from the project process and benefits.	• Involve and engage youths, especially the drop-out and unemployed girls and boys, in water governance and management forums like WUAs, for their participation and benefit-sharing.
4.	Women outnumber men in the 'divorced' and 'widowed' category with the risks of increased vulnerability to poor livelihood support system.	• Targeted inclusion, participation and access of such community groups for equal access to opportunities from the project activities and empowerment for resilience.
5	Farming is the dominant occupation with more women than men involved in it.	• Design and schedule implementation project activities ensuring women's farm labour calendars are not affected. • Promote use of gender-friendly and mechanised equipment, tools and machinery.
6	Women have longer experience of living in the same village than men.	• Involve and engage rural women for local knowledge and practices in climate-adaptation strategies.
7	Social customs and practices give women takes more ownership of agriculture lands, just as more women take the matrimonial rights for HH head positions.	• Leverage women's capacity for leadership positions and roles in project activities, such as water governance, water scheme protection and maintenance, and leading climate-adaptation mechanisms.
8.	Gendered roles, stereotyping, structural barriers and social norms create women's unequal distribution of HH chores with men. That increases women's burden, affecting their access and opportunities for participation in capacity-building trainings, income-generating works, leisure	• Design, plan and implement project activities in a manner that considers women's convenient timing, availability, easy reach and without giving them additional burdens. • Schedule project activities to enable women's participation and involvement. • Creating enabling conditions for women's unrestricted participation and engagement, with affirmative measures, such as allowing to be accompanied by maid (for lactating mothers), etc.

	and recreational activities, health and wellbeing.	
9	Memberships in different groups in the community are gendered and unequal scope of engagement between men and women is different.	• Promote women's membership and participation in community trade and businesses groups. • Enhance and strengthen women's membership and participation in water governance platforms and WUAs, supported by affirmative strategies.
10	Low community knowledge and understanding on how climate-change affects women and men differently due to gendered roles, structural barriers, social norms and practices.	• Sensitisation and capacity-building on gender-based and gender-differentiated impacts of climate change.

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ADAPTATION FUND

Securing Water and Enhancing Climate Resilience in Thimphu (rural) District, Bhutan

Adaptation Fund (AF) Single Country Locally Led Aadaptation (LLA) Project

Gender Action Plan (GAP)

Prepared and submitted as Annex to the full Project Proposal Document under Single Country LLA Project on ' Securing Water and Enhancing Climate Resilience in Thimphu (rural) District, Bhutan'.

Department of Macro-Fiscal and Development Finance (DMDF), Designated Authority (DA)

Bhutan Trust Fund for Environmental Conservation (BTF) National Implementing Entity

1. Purpose and Objectives of GAP

This Gender Action Plan (GAP) is developed for the AF's Single Country LLA Project on '*Securing Water & Enhancing Climate Resilience in Thimphu (Rural) District, Bhutan'*, which is aimed at enhancing the capacities and resilience of Thimphu district's vulnerable rural communities (five Gewogs) in climate adaptation through improved water management and ecosystem-based adaptation (EbA) practices.

This GAP is informed by a comprehensive Gender Analysis that studied the gender context within which the project will be implemented, and gathered critical insights on the gender roles, responsibilities, access to resources, and decision-making dynamics relevant to the project. This GAP is a mechanism to address key gender concerns and gaps perceived through the gender analysis in order to uphold gender balance and pursue gender equality across the project activities.

2. Summary of Key Gender Concerns, Gaps and Recommendations from Gender Analysis

No.	***Gender status, concerns, and gaps***	***Recommendations***
1.	Male out-migration leaves women as a de-facto household head, shouldering the brunt of household livelihood responsibilities with increased burden of climate-change impacts. Women tend to be involved more in rural farming and agricultural activities, leading to feminisation of agriculture, with more risks of exposure to climate-impacts.	• Design, plan and implement the project activities in a manner that does not further increase women's burden and risks of climate-change impacts. • Carry out assessment and analysis of gender-based implications as part of the design and planning of project activities to inform gender-responsive and gender-balanced strategies of implementation. • Involve women in designing, planning and implementation of project activities to consider their adaptation needs. • Schedule implementation of project activities corresponding to women's maximum participation without implicating their gendered roles and responsibilities. • Promote use of gender-friendly tools and mechanised machinery.
2	Male skews in the Project's rural population (eg. Chhangdagang, Wangdrog, Chamgang Maed and Chizhi) leaves room for male-dominance in participation, decision-making and access to resources/opportunities. Likewise,	• Provide gender-equality sensitisation and awareness programmes targeted at Chiwogs with male or female skews. Gender-equality and women's empowerment sensitisation for Chiwogs with male skews, women's capacity-building women's programmes on climate-change impacts adaptation strategies and participation in water governance.

	some other Chiwogs (Genyenkha, Zanglegkha and Khasadrupchhu) have female skew, risking women's exposure to adverse climate-change impacts.	
3	Low participation of youths in the consultations as well as HH survey, due to which their perceptions could not be incorporated in the analysis, risking their exclusion from the project process and benefits.	• Involve and engage youths, especially the drop-out and unemployed girls and boys, in water governance and management forums like WUAs, for their participation and benefit-sharing.
4.	Women outnumber men in the 'divorced' and 'widowed' category with the risks of increased vulnerability to poor livelihood support system.	• Targeted inclusion, participation and access to such community groups for equal access to opportunities from the project activities and empowerment for resilience.
5	Farming is the dominant occupation with more women than men involved in it.	• Design and schedule implementation project activities ensuring women's farm labour calendars are not affected. • Promote use of gender-friendly and mechanised equipment, tools and machinery.
6	Women have longer experience of living in the same village than men.	• Involve and engage rural women for local knowledge and practices in climate-adaptation strategies.
7	Social customs and practices give women takes more ownership of agriculture lands, just as more women take the matrimonial rights for HH head positions.	• Leverage women's capacity for leadership positions and roles in project activities, such as water governance, water scheme protection and maintenance, and leading climate-adaptation mechanisms.
8.	Gendered roles, stereotyping, structural barriers and social norms create women's unequal distribution of HH chores with men. That increases women's burden, affecting their access and opportunities for participation in capacity-building trainings, income-generating works, leisure and recreational activities, health and wellbeing.	• Design, plan and implement project activities in a manner that considers women's convenient timing, availability, easy reach and without giving them additional burdens. • Schedule project activities to enable women's participation and involvement. • Creating enabling conditions for women's unrestricted participation and engagement, with affirmative measures, such as allowing to be accompanied by maid (for lactating mothers), etc.
9	Memberships in different groups in the community are gendered and unequal scope of engagement between men and women is different.	• Promote women's membership and participation in community trade and businesses groups. • Enhance and strengthen women's membership and participation in water governance platforms and WUAs, supported by affirmative strategies.
10	Low community knowledge and	• Sensitisation and capacity-building on gender-based and

	understanding on how climate-change affects women and men differently due to gendered roles, structural barriers, social norms and practices.	gender-differentiated impacts of climate change.

3. Structure of GAP and How to Read GAP

The Project activities under its Outcomes and Outputs are screened from a gender lens with the approach of gender mainstreaming and gender equality. The key gender concerns, gender gaps and needs identified from the gender analysis are integrated across the project activities to make them gender responsive, and helps guide the implementing agencies concerned to consider gender elements of the respective project activities. For each activity, corresponding gender responsive measures and gender actions are identified. Relevant activities to address specific gender needs are budgeted.

Outcome 1: Increased ecosystem resilience in response to climate change and variability-induced stress.												
Component 1: Ecosystem based adaptation to ensure natural capacity for water infiltration, recharge and water buffering implemented.												
Output 1.1 : Water Resource Management & Governance strengthened												
Activity		***Activity and description***			***Gender concerns, gap and needs***	***Gender Action***	***Target/Indicator***	***Time/ year***	***Responsible agency***	***Collaborating agency***	***Budget (USD)***	***Budget Description***
		Sub-activity		***Activity type***								
1.1.1	Update Water Policy and Vision 2008	1.1.1 (a)	Revision of Water Policy and Vision 2008	Workshop/ Meetings)	* Policy drafting task force may not engage adequate number of men and women to make the policy gender responsive and gender may not be effectively mainstreamed in the policy statements and strategies; * Draft policy public consultation process may not involve adequate number of women and men, and necessary concerns and needs of men and women concerned may not be adequately heard and incorporated in the policy. * Despite meeting gender parity in drafting task force and public consultations, gender equality measures may not be discussed and incorporated in the draft policy. * Composition of Policy screening and approval committee/taskforce may not include adequate number of women and men members. * Policy drafting task force members may not have required capacity for gender mainstreaming and incorporating gender-equality measures.	1.Include adequate number of men and women in the policy drafting task-force; 2. Public consultations of the drat policy is made gender responsive and participatory with adequate number of women and men; 3. Gender equality and gender-responsiveness of the policy is adequately discussed during the public consultations of the policy and gender concerns and needs, and gender equality measures incorporated; 4. Policy screening as well as approval committee are composed of members with adequate number of women and men. 5. Sensitise and train policy drafting taskforce members on gender mainstreaming, incorporation of gender-equality measures in the draft policy.	1. At least two members of the policy drafting task force are women; 2. Provide at least one sensitisation and training for Policy drafting taskforce members by a Gender Expert/NCWC, etc on gender equality and gender mainstreaming, and incorporation of gender-responsive policy measures. 3. Both women and men's participation in all public consultations is at least 30%. 4. Policy public consultations include discussion on gender equality measures. 5. Policy statements include at least 1 gender equality measures; 6. Policy is screened from gender lens using the policy screening protocol and process-steps, with at least two women members in the policy screening committee.	Y1 (Q2, Q3)	DoW	DoFPS; DoA; DLGDM; Thimphu Dzongkhag; 5 Project Gewogs of Thimphu; NCWC/etc.	3,300	Costs of two-day training for 8 to 11 members - gender expert/trainer fees; participants' perdiem and accommodation; hall charges, working lunch/refreshments; participants' transportation/communication allowances; miscellaneous expenses.
1.1.2	Adoption of the IWRM principles	1.1.2 (a)	Develop Wangchu River Basin Management Plan.	Meetings/ Workshops; data collection; professional services	* Adopt participatory and consultative approach to ensure that the Plan and its implementation framework is gender-responsive, and meets the priorities and needs of women and men. * Include both women and men, especially vulnerable groups of the settlements along the river basin, and incorporate gender-related measures. * Implement gender equality and	1. Include adequate number of women and men in all public consultations to inform the drafting of the Plan. 2. Carry out comprehensive gender analysis/assessment. 3. Put in place and implement Gender (Equality) Action Plan, with gender actions, and gender-equality measures in the management plan.	1. Participation of men and women in all public consultations is at least 30%. 2. 1 Gender Analysis/Assessment carried out. 3. Gender (Equality) Action Plan put in place and implemented, including sensitisation and awareness	Y1(Q3); Y2 (Q1 to Q4); Y3 (Q1 to Q4)	DoW	DoFPS; DoA; DLGDM; Dzongkhags and Gewogs concerned; NCWC/etc.	5,000	Costs of: gender analysis study and development of action plan; gender analysis finding consultation and validation workshops; workshop on validation and operationalisation

					gender mainstreaming strategies, based on gender analysis and action-plan.		sessions on prevention of SEAH.					of gender action plan.
		1.1.2 (b)	Develop Wangchu Water Security Index System.	Meetings/workshops/trainings; professional services	Strengthen women's safety is a fundamental prerequisite for water security system. Therefore, recognise and include both women and men beyond mere beneficiaries, and involve them as key stakeholders in leadership and decision-making forums to take the following into considerations: - Women and girls' unpaid labour burden in collecting household water, that limits their social and economic opportunities; - Risks of harassment and gender-based violence (GBV) for women and girls due to burden of water collection and poor sanitation. - Barriers frequently faced by women in securing water rights due to discriminatory land ownership;	1. Collect sex-disaggregated demographic and health indicators on water access and socio-economic status to expose hidden disparities. 2. Measure and monetize the time burdens of unpaid water hauling and caregiving to capture the true economic toll of water insecurity on women and girls. 3. Include indicators that measure the minimisation of risks of gender-based violence (GBV) during water collection and the availability of gender-segregated, hygienic WASH facilities. 4. Consider inclusion of women in leadership and decision-making roles (e.g., on local water committees, basin boards, or policy-making bodies) beyond tokenism to active influence. 5. Consider to assess and evaluate legal and customary barriers regarding women's equal rights to land and water resources. 6. Assessment of women's equity in access to irrigation water, credit, and water-related technologies, as women make up a large portion of the agricultural workforce but often lack control over productive resources. 7. Track how water-related disasters (floods, droughts) disproportionately disrupt women's livelihoods, safety, and health, integrating women into community-level disaster mitigation planning.	1. Development of water security index system is informed by gender analysis showing women's socio-economic status and hidden disparities , women's unpaid burdens of water collection, risks of GBV, etc. 2. Women included in basin board and other leadership committees. 3. Water security index system includes assessment and minimisation of legal and customary barriers to women for equal rights to land and water resources; access to water, credit, and water-related technologies. 4. Water security index system includes methods of tracking and minimising disproportionate disruption to women's livelihoods, safety, and health.	Y1(Q3); Y2 (Q1 to Q4); Y3 (Q1 to Q4)	DoW	DoW; DoFPS; DoA; DLGDM; Dzongkhags and Gewogs concerned; NCWC/etc.	0	No specific budget requirement; the gender activities can be implemented within the activity budget.
		1.1.2 (c)	Establish Wangchu River Basin Committee.	Workshops /meetings	Basin Committee has to be gender-balanced and the Committee must consider gender-based concerns in its mandate to implement gender equality measures	1. ToR of the Committee requires inclusion and engagement of desired number of women and men for gender-equality in participation and decision-making by the Committee.	1. At least 5 women (including at least 1 woman each from relevant Dzongkhags and Gewogs is in the Wangchu River Basin Management Committee. 2. The Committee's TOR mandates the Committee on implementation of Gender Action Plan of the Wangchu	Y3 (Q3, Q4)	DoW	DoFPS; DoA; DLGDM; Dzongkhags and Gewogs concerned;	0	No specific budget requirement; the gender activities can be implemented within the activity budget.

							Basin Management Plan and Strategy.					
1.1.3	Institute knowledge bank on water resources management	1.1.3 (a)	Strengthen the programme on the water curriculum at the College of Science and Technology.	equipment/ computers	* Include gender equality and gender-responsive water governance and management strategies, and lesson plans in the curriculum, including: - Analysis of Division of Labour in terms of gendered and differentiated roles between women and men in household chores such as water collection, agricultural duties and WASH to understand differentiated gendered roles and, gender-based household burdens. - Mapping Access to Water Resource and Control, to teach students on evaluation of community water rights, land ownership rights, opportunities to operate irrigation technologies, impacts of resource pricing on single-headed female households, etc. - Training for Inclusive Leadership, such as roleplay or simulate community water user committees, emphasizing equal representation and voice for women and marginalized groups in infrastructure planning. - Addressing Specific Needs: Include modules on gender-specific health and safety, such as the importance of safe water pathways, and designing schools to support menstrual hygiene management. - Working with Disaggregated Data: Teaching on how to collect, record, and analyse sex-disaggregated water data, essential to making fair and sustainable local water policies.	1. Write shop for curriculum developers on design and development of gender-based and gender-responsive water curriculum. 2. Water curriculum incorporates gender-equality and gender-responsive strategies and management.	1. One write shop for gender-responsive and gender-based curriculum developers, with at least 3 women conducted. 2. Water curriculum includes gender-based and gender-responsive teaching and learning syllabus.	Y1 (Q1, Q2, Q3, Q4)	DoW	DoW; RUB; MoE, CST.	0	No budget requirement; the gender activities can be implemented within the activity budget.
		1.1.3 (b)	Assess ongoing water adaptation activities and publish a paper on the future intervention	Field surveys/workshops/publication fees	Paper should include research on gender-based water adaptation, including impact of water-induced stress on women, women's vulnerability and recommendations for gender-responsive adaptation strategies	1. Include components on assessment of water-induced stress on women and their vulnerability, and recommendations for gender-responsive adaptation strategies	1. Findings and recommendations include gender-based research and gender-responsive adaptation measures	Y2 (Q1, Q2, Q3, Q4)	DoW	Agencies concerned	0	No budget requirement; the gender activities can be implemented within the activity budget.

			measures.									
1.1.4	Carry out hydrological mapping and appropriate revival measures; and, implement suitable EbA solutions for watershed conservation and restoration for a sustainable supply of water.	1.1.4 (a)	Carry out hydrogeological mapping and identify potential recharge areas of the water supply schemes.	Field survey	Men and women's differential interaction with local landscapes and water uses, their distinct traditional ecological knowledge, labour burdens, and decision-making roles must inform every phase of watershed management. Inclusion of women in consultation for mapping and identification of recharge areas is valuable, as women often have highly localized knowledge of soil moisture, seasonal flow changes, and specific traditional uses (e.g., holy water sites, laundry areas, and livestock watering).	1. Involve local women with men during field visits to identify exact coordinates of historical springs, shallow wells, saturated zones, and types of land-cover or vegetation (e.g., broad-leaved trees for fodder, specific groundcovers) that will thrive in the recharge zone and support their daily livelihoods 2. Involve both men and women in measuring spring discharge and educating them on how to accurately gauge flow rates. 3. Include both female and male extension workers or hydrologists during technical field assessments and mapping to facilitate open communication with all community members; 4. Involve both men and women in delineating the boundaries of recharge zones.	1. Conduct participatory gender analysis with sex-disaggregated data to understand how different genders access, use, and benefit from water resources before identifying and planning EbA intervention activities. The analysis should include identification and mitigation of potential protection risks, such as GBV associated with traveling long distances to new or altered water sites. 2. Design EbA measures (e.g., traditional water storage, reforestation of recharge zones, etc) in consultation with local women to ensure incorporation of their traditional and local environmental insights, 3. Implement inclusive community-based management and governance strategies to ensure equal participation and decision-making, and equitable benefit-sharing. 4. Besides ecosystem services, ensure that EbA measures support women's economic security and agricultural productivity. 5. Design and implement targeted training and workshops to ensure both men and women are equally sensitised and capacity built on the use and benefits, as well as the risks prevention and mitigation measures.	Y1 (Q1, Q2, Q3, Q4)	DoW	Dzongkhags and Gewogs concerned; NCHM; DFPS, etc.	0	No budget requirement; the gender activities can be implemented within the activity budget.
		1.1.4 (b)	Design and implement appropriate EbA measure	Workshops /public consultations; watershed protection	* Women and girls are primarily responsible for household water collection and use. EbA measures should aim at reducing walking distance (e.g., via wetland restoration or spring protection) to free up time and labour for women and girls.	1. Conduct participatory gender analysis with sex-disaggregated data to understand how different genders access, use, and benefit from water resources before identifying and planning EbA intervention activities. The analysis	1. Design and implementation of EbA measures are based on a participatory gender analysis informing how different genders access, use, and benefit from EbA activities,	Y2 (Q1, Q2, Q3, Q4)	DoW	DoFP; Dzongkhags and Gewogs	5,000	Costs of validation on findings of gender analysis carried out for EbA measures, and training of affected

			s to sustain the sources.	interventions	* EbA measures to be aligned with women's rights over secure land tenure and water rights, enabling their full participation or equal benefit-sharing from long-term ecosystem management. * Women possess critical indigenous knowledge of local flora, hydrology, and seasonal shifts. This must be co-opted directly into watershed restoration plans. * Water insecurity and the necessity to travel long distances for water heighten the risk of gender-based violence and harassment. EbA measures to consider minimisation of women's safety risks. * Provide targeted training and technical roles for women in EbA measures implemented (including participatory monitoring, etc). * Utilise sex-disaggregated and intersectional data to track how men and women respectively benefit from EbA. * EbA measures should aim at supporting women's economic resilience, besides just ecosystem services.	should include identification and mitigation of potential protection risks, such as GBV associated with traveling long distances to new or altered water sites. 2. Design EbA measures (e.g., traditional water storage, reforestation of recharge zones, etc) in consultation with local women to ensure incorporation of their traditional and local environmental insights. 3. Implement inclusive community-based management and governance strategies to ensure equal participation and decision-making, and equitable benefit-sharing. 4. Besides ecosystem services, ensure that EbA measures support women's economic security and agricultural productivity. 5. Design and implement targeted training and workshops to ensure both men and women are equally sensitised and capacity built on the use and benefits, as well as the risks prevention and mitigation measures.	and mitigation of potential risks. 2. No. of local men and women involved and consulted in design and implementation of EbA activities. 3. Type and No. of women's economic security and agricultural productivity supported by EbA activities. 4. One targeted sensitisation and trainings for men and women on the use and benefits, as well as the risks prevention and mitigation measures.					stakeholders on equal access to EbA resources, participation and benefit-sharing. 2-day sensitisation workshops with participants from five project Gewogs; Resource person's fees; participants perdiem and accommodation charges; hall charges, working lunch/refreshments; participants' transportation/communication allowances; miscellaneous expenses.
		1.1.4 (c)	Installation of microclimate and meteorological stations.	Procurement of meteorological stations; Construction of fencings for meteorological stations.	* Sensitisation for relevant local women and men, and LG functionaries on informed climate-change adaptation based on the use of microclimate and meteorological stations. * Carry out tailored early warning dissemination to uphold gender roles in influencing how people receive information through customised messaging. For instance, since women mostly rely heavily on informal discussion groups, early warnings should be distributed through these channels rather than relying solely on mobile alerts. * Collect sex-disaggregated data to track how weather and water-level alerts are accessed and utilized by different genders, allowing for continuous refinement of climate services.	1. Sensitise relevant local women and men, and LG functionaries on the use of microclimate and meteorological stations for informed decision-making in climate-change adaptation. 2. No. of women and men accessing and utilising weather and water-level alerts to inform climate services.	1. No. of women and men sensitised and trained on use of information from microclimate and meteorological stations, and capacity of local communities enhanced for informed decision-making. 2. No. of women and men accessing and utilising weather and water-level alerts to inform climate services.	Year 2	PMU; NIE; DA; Executing Agency	Y2 (Q1, Q2, Q3, Q4)	5000	Costs of 2-day sensitisation and trainings for relevant men and women from five project Gewogs. Participants' perdiem, accommodations, travel allowances, working lunch and refreshments, miscellaneous expenses.
		1.1.4 (d)	Built in-house capacity	Trainings	* Equal participation of women and men in the capacity-building training. * Gender concerns and needs	1. Include women and men in the capacity-building training in carrying out modelling work.	1. No. of women and men trained in carrying out modelling works, and	Y2 (Q3, Q4)	DoW	NCHM; relevant agencies	0	No budget requirement; the gender activities

			by providing training and capacity development to carry out modelling works.		incorporated and implemented in the modelling works, and capacity of women enhanced in carrying out the modelling works.	2. Discuss and incorporate gender concerns and needs in the modelling works.	capacity of women and men built. 2. Type and No. of gender concerns and needs incorporated in the modelling works.					can be implemented within the activity budget.
Output 1.2: EbA solutions & SLM to enhance watershed functions and minimise impact of floods and extreme rainfall implemented.												
Activity		***Activity description***			***Gender concerns, gap and needs***	***Gender Action***	***Target/Indicator***	***Implementation time/year***	***Responsible agency***	***Collaborating agency***	***Budget (Nu.)***	**Budget Description**
		Sub-activity		***Activity type***								
1.2.1	Implementation of EbA solutions through community participation and engagement	1.2.1 (a)	Support sustainable land development through efficient utilisation of agricultural land (terrace development and consolidation)	Machine Hiring/ Fuelling	* Land development activities should take into account women's land rights, ensuring that introduction of high-value cash crops doesn't cause men to seize land traditionally farmed by women. * Labor-intensive building and maintaining terraces should prevent and mitigate risks in increasing women's unpaid workload, especially in the context of male out-migration. * Construction of check dams & bioengineering works are often perceived culturally as "men's work" due to the physical effort involved. This often excludes women planning and consultation processes of such water-related interventions, however, women facing the burdens or risks related to degradation of water systems.	1. Gender-Responsive Consultation: Ensure women have an equal voice in community decision-making and project design to reflect their specific land-degradation priorities. 2. Labor-Saving Technologies: Implement SLM in ways that actively reduce women's heavy workloads, such as providing access to water-harvesting infrastructure closer to homes and easing physical burdens. 3. Targeted Extension Services: Provide agricultural training, credit, and extension services tailored directly to female smallholders (as they are often bypassed by male-dominated agricultural networks)	1. No. of women (30%) and men involved in SLM consultation and planning processes. 2. Specific land-degradation priorities, risks and mitigation measures of both women and men taken into consideration and incorporated ruing SLM implementation.	Y1 (Q 3); Y (Q2 & Q3); Y 3 (Q2 & Q30	DoA	Relevant agencies	0	No budget requirement; the gender activities can be implemented within the activity budget.
		1.2.1 (b)	Support sustainable land development through efficient utilisation of agricultural land (bio-engineering, check - dam & orchard basin	Material support					DoA	Relevant agencies		

			management)									
		1.2.1 (c)	Conduct a feasibility study for storing excess water.	Assessment of feasible options on excess water storage	* Assessment of how new storage locations impact the time women, men and girls spend in collecting water, and ensure women and men are not affected by storage facility located at a distant or difficult to operate area. * Assess the physical design of the storage site, including safe pathways, lighting, and lockable taps to mitigate risks of gender-based harassment or violence. * Ensure equal representation of women in community consultations, and phases of infrastructure design. * Prioritise water storage and distribution points that support female-specific hygiene needs, including menstrual health management, and safe, gender-segregated sanitation facilities at the community level. * Analyse who in the community or household will have ownership rights and control over the distribution of the stored water to prevent inequalities in resource allocation.	1. Analysis to inform how new storage locations impact the time women, men and girls spend in collecting water, and identify potential risks and mitigation measures for women and men. 2. Equal representation of women in community consultations, and phases of infrastructure design. 3. Ensure distribution of stored water resources do not create inequalities based on ownership rights and control over the distribution of the stored water. 4. Make the guideline gender-responsive, with requirement for women's engagement and roles in decision-making in climate-resilient water and water-related services.	1. Analysis carried out and feasibility study informed by data on how new storage locations impact the time women, men and girls spend in collecting water, and potential risks and mitigation measures identified. 2. No. of women (30%) and men involved and engaged in community consultations on feasibility study, and phases of infrastructure design. 3. Gender-based needs and requirements incorporated in the guiding framework for climate-resilient water and water-related services.	Y1 (Q1, Q2, Q3, Q4); Y2 (Q1, Q2, Q3)	DoW	Relevant agencies	0	No budget requirement; the gender activities can be implemented within the activity budget.
		1.2.1 (d)	Develop and design an implementation plan.	Meetings/workshops; consultancy services				Y1 (Q1, Q2, Q3, Q4); Y2 (Q1, Q2, Q3)	DoW	Relevant agencies; consultants	0	No budget requirement; the gender activities can be implemented within the activity budget.
		1.2.1 (e)	Develop a guiding framework for climate-resilient water and water-related services.	Meetings/workshops; consultancy services				Y2 (Q1, Q2, Q3, Q4)	DoW	Relevant agencies; consultants	5,000	Costs of 2-day sensitisation and trainings for relevant men and women from five project Gewogs. Participants' perdiem, accommodations, travel allowances, working lunch and refreshments, miscellaneous expenses.
1.2.2	Develop a guide for Drought Preparedness and Response Plan (DPRP)	1.2.2 (a)	Develop a guideline for an overall framework for DPRP, and develop DPRP for Thimphu Dzongkhag	Meetings/workshops; consultancy services	* Baseline study supported by sex-disaggregated data with risks and vulnerability mapping. * Impact analysis on how gender norms dictate specific workloads, mobility, and access to resources, identifying exactly why women bear disproportionate burdens during dry seasons. * Ensure early warning systems are gender-responsive, meaning alerts and drought communications are transmitted through channels (e.g., local radio networks, community leaders) accessible to women. * Equal representation of women, female-headed households, and youth in community disaster committees, planning meetings, and decision-making platforms. * Guarantee that relief distributions (e.g., food supplements, cash transfers,	1. Carry out baseline study with sex-disaggregated data and vulnerability mapping with identification of risks on how gender norms dictate specific workloads, mobility, and access to resources to women and men. 2. Gender responsive early warning systems, with alerts and drought communications transmitted through accessible channels. 3. Involve equal representation of women, including female-headed households in disaster committees, planning meetings, and decision-making platforms. 4. Relief distributions reach female-headed households and lactating mothers. 5. Identify and incorporate off-farm economic opportunities and access	1. Baseline study and impact analysis carried out, and DPRP guideline/framework developed with incorporation of gender-based . 2. No. of women and men benefiting from drought early warning alerts transmitted through channels accessible to women and men. 3. No. of women and men with access to relief distributions , including type and number of off-farm economic opportunities and drought-resistant, gender-sensitive technologies. 4. No. of women (30%) and men participated in the sensitisation and training on	Y1 (Q1, Q2, Q3, Q4); Y2 (Q1, Q2, Q3, Q4)	DoW	Relevant agencies; Consultants	6500	Costs of 2-day sensitisation and trainings for relevant men and women from five project Gewogs. participants'' perdiem, accommodations, travel allowances, working lunch and refreshments, miscellaneous expenses.

					seeds) are designed to reach female-headed households and lactating mothers. * Support off-farm economic opportunities and access to drought-resistant, gender-sensitive technologies to offset the loss of agricultural income * Address potential risks (due to drought) of GBV and burdens related to unpaid care work (such as fetching water from greater distances). * Sensitisation and training on use and implementation of guideline, with targeted indicators (e.g., number of women trained in water-efficient farming, percentage of female beneficiaries) to monitor the effectiveness of the DPRP.	to drought-resistant, gender-sensitive technologies to offset the loss of agricultural income 6. Minimise potential risks (due to drought) of GBV and burdens related to unpaid care work (such as fetching water from greater distances). 7. Gender-inclusive sensitisation and training on use and implementation of guideline.	the use of DPRP guideline and framework.					
1.2.3	Promotion of Climate-smart and Sustainable Agriculture Practices	1.2.3 (a)	Promote protected agriculture to enhance year-round production, improve productivity, and strengthen climate resilience.	Material support	* Use of mechanised or gender-friendly farming technologies and practices, to avoid increased manual labour for women. * Focus on women-led transformations that explicitly save labour, such as direct-seeded crops.	1. Gender-friendly agriculture equipment and tools	* No. of gender-friendly equipment and tools.	Y1 (Q2 & Q3), Y2 (Q2 & Q3)	DoA	Relevant Dzongkhags and Gewogs	0	No budget requirement; the gender activities can be implemented within the activity budget.
		1.2.3 (b)	Promote the adoption of smart irrigation and water harvesting technologies to improve water-use efficienc	Material support	* Use of mechanised or gender-friendly irrigation and water harvesting technologies. * Focus on women-led transformations that explicitly save labour, such as automated drip irrigation.	1. Support mechanised or gender-friendly irrigation and water harvesting technologies, with focus on women-led transformations that explicitly save labour, such as automated drip irrigation.	1. No. of gender-friendly irrigation and water harvesting technologies supported.	Y1 (Q2 & Q3), Y2 (Q2 & Q3)	DoA	Relevant Dzongkhags and Gewogs	0	No budget requirement; the gender activities can be implemented within the activity budget.

			y and climate resilience.									
		1.2.3 (c)	Promote the adoption of organic agriculture, Good Agricultural Practices (GAP), and integrated soil fertility and integrated pest management (IPM) practices.	Material support	* Gender-responsive agriculture and pest management practices	1. Gender-responsive agriculture and pest management practices	1. No. of gender-responsive agriculture and pest management practices supported and implemented.	Y1 (Q2 & Q3), Y2 (Q2 & Q3)	DoA	Relevant Dzongkhags and Gewogs	0	No budget requirement; the gender activities can be implemented within the activity budget.
Output 1.3: Mitigation of forest fire hazards by promoting integrated forest fire management.												
Activity		***Activity description***			***Gender concerns, gap and needs***	***Gender Action***	***Target/Indicator***	***Implementation time/year***	***Responsible agency***	***Collaborating agency***	***Budget (Nu.)***	**Budget Description**
		Sub-activity		***Activity type***								
1.3.1	Establishment of Gewog level forest fire coordinating group (GFCGG) in Thimphu district to foster community participation in forest fire management.	1.3.1 (a)	Stakeholder Consultation & Formation of GFFCG	Meetings/workshops	* Equal representation of women and men in the consultation;	1. Involve and engage women representatives in the coordination group;	1. No. of women (30%) and men in the coordination group;	Year 1 & 2	DoFPS	/DLGDM; relevant Dzongkhags and Gewogs	0	No budget requirement; the gender activities can be implemented within the activity budget.
		1.3.1 (b)	Development of ToR, Guidelines & Planning Documents: Drafting, review, and validation	Meetings/workshops	* Coordination group's ToR and Guidelines includes management of gender-based needs and activities to implement risks from forest fire on women and men.	1. Coordination group consider mitigation of risks based on gendered roles during fire incidences.	1. Mechanisms to minimise risks based on gendered roles and needs incorporated in the ToR of the coordination group and guidelines. 2. Coordination group's ToR requires equal representation of women and men in the coordination group.	Y1 (Q2 & Q3); Y2 (Q2 & Q3)	DoFPS	/DLGDM; relevant Dzongkhags and Gewogs	0	No budget requirement; the gender activities can be implemented within the activity budget.

			workshops Coordination meetings for endorsement and finalization									
		1.3.1 (c)	Capacity Building & Training: training workshops for GFCG members on forest fire prevention and response	Meetings/workshops	* Equal training for both women and men in fire prevention, patrolling, and firebreak creation, prioritised on specific daily routines of women.	1. Prioritise specific daily routines and gendered roles of women in sensitisation and training.	1. No. of women and men of coordination group trained. 2. Gender-based needs and priorities included in the training curriculum.	Y1 (Q2 & Q3); Y2 (Q2 & Q3)	DoFPS	/DLGDM; relevant Dzongkhags and Gewogs	0	No budget requirement; the gender activities can be implemented within the activity budget.
		1.3.1 (d)	Procurement and distribution of Firefighting Tools & Basic Equipment.	Material support	* Gender-friendly fire-fighting tools and equipment	* Support gender-friendly fire-fighting tools and equipment.	1. No. of gender-friendly fire-fighting tools and equipment supported.	Y1 (Q2 & Q3); Y2 (Q2 & Q3)	DoFPS	/DLGDM; relevant Dzongkhags and Gewogs	0	No budget requirement; the gender activities can be implemented within the activity budget.
1.3.2	Development of Ecosystem based adaptation solution for the forest fire suppression.	1.3.2 (a)	Development of nature-based adaptation solution for the forest fire suppression (Construction of the	Infrastructure	* Ensure friendly accessibility for women and girls so that there are no GBV risks or harassment. * Pathways to the dam needs to be well-lit, and the embankment must have safe access points for both fire equipment and community members. * Training and capacity-building for women and men to equip them with technical skills, and empower local women in operation of pumps and manage reservoir levels for their climate resilience.	1. Design and place the reservoir at locations that will ensure accessibility for women and girls without GBV risks or harassment along the pathways. * Ensure embankment have safe access points for both fire equipment and community members. * Capacity-building training for women and men to equip them with technical skills in operation of pumps, and manage reservoir levels for their climate resilience.	1. Reservoir accessed and used by women and men without risks of GBV or SEAH. 2. Free and safe access points to embankment for both fire equipment and community members. 3. No. of women (30%) and men sensitised and trained, and capacity built in operation of pumps, etc.	Y1 (Q2 & Q3); Y2 (Q2 & Q3)	DoFPS	/DLGDM; relevant Dzongkhags and Gewogs	5,000	Costs of 2-day sensitisation and trainings for relevant men and women from five project Gewogs. Participants' perdiem, accommodations, travel allowances, working lunch and refreshments, miscellaneous expenses.

			earthen dam) 1. Gewog: Kawan ((New Creation) Zilkha – 1 Wangdue Tse – 1									
		1.3.2 (b)	Development of Nature based adaptation solution for the forest fire suppression (Construction of the earthen dam): 4. Gewog: Geney Wangbama – 1 (New Creation)	Infrastructure				Y1 (Q2 & Q3); Y2 (Q2 & Q3)	DoFPS	/DLGDM; relevant Dzongkhags and Gewogs		
Outcome 2. Ensure access to irrigation and safe and reliable drinking water.												
Component 2: Community-based climate resilient drinking water and irrigation infrastructure established												
Output 2.1 Enhanced access to clean and safe drinking water												
Activity description				***Gender concerns, gap and needs***	***Gender Action***	***Target/Indicator***	***Implementation time/year***	***Responsible agency***	***Collaborating agency***	***Budget (Nu.)***	**Budget Description**	
Activity			***Activity type***									
2.1.1	Construction of Pumola (Tshomabu) to Woluna/Danglo Drinking Water Supply (Maedwang Gewog)		Infrastructure (New)	* Equal involvement and participation by women in consultations during planning, designing, and management of construction activities, and	* Involve equal women and men in consultations during planning, designing, and management of construction activities, and	1. No. of women (30%) involved and participated in planning, designing, and management of the water	Y1 & 2	DoID	Thimphu Dzongkhag; 5 Project Gewogs of Thimphu	0	No budget requirement; the gender activities can be	

2.1.2	Construction of Kiplungchhu to Chhangdagang Drinking Water Supply (Kawang Gewog)	Infrastructure (New)	maintenance works. * Equal labour fees and allowances for women when they are involved in construction activities. * Right safety equipment's; * Minimise labour burdens for women based on gendered roles.	maintenance works. * Ensure women and men are paid equal labour fees and allowances when involved in construction activities. * Right safety equipment; * Minimise labour burdens for women based on gendered roles.	supply construction activities, and maintenance of schemes. 2. No. or minimised labour burdens for women.	Y1 & 3	DoID	Thimphu Dzongkhag; 5 Project Gewogs of Thimphu		implemented within the activity budget.
2.1.3	Construction of Helela to Chamgang Drinking Water Supply (Dakarla Gewog)	Infrastructure (New)				Y1 & 4	DoID	Thimphu Dzongkhag; 5 Project Gewogs of Thimphu		
2.1.4	Construction of Domtshang-Nye to Khasadrupchhu Town Drinking Water Supply (Maedwang Gewog)	Infrastructure (New)				Y1,Y2 & Y3	DoID	Thimphu Dzongkhag; 5 Project Gewogs of Thimphu		
2.1.5	Construction of Ngabiphu to Rama-Tokto Drinking Water Supply (Maedwang Gewog)	Infrastructure (New)				Y1 & 2	DoID	Thimphu Dzongkhag; 5 Project Gewogs of Thimphu		
Output 2.2: Enhanced access to adequate irrigation water										
Activity description			***Gender concerns, gap and needs***	***Gender Action***	***Target/Indicator***	***Time/year***	***Responsible party***	***Collaborating agency***	***Budget (USD)***	**Budget Description**
Activity		***Activity type***								
2.2.1	Renovation of lower Woluna/Danglo irrigation Channel (Maedwang Gewog)	Infrastructure(Rehabilitation)	* Equal involvement and participation by women in consultations during planning, designing, and management of construction activities, and maintenance works. * Equal labour fees and allowances for women when they are involved in construction activities. * Right safety equipment; * Minimise labour burdens for women based on gendered roles.	* Involve equal women and men in consultations during planning, designing, and management of construction activities, and maintenance works. * Ensure women and men are paid equal labour fees and allowances when involved in construction activities. * Right safety equipment; * Minimise labour burdens for women based on gendered roles.	1. No. of women (30%) involved and participated in planning, designing, and management of the water supply construction activities, and maintenance of schemes. 2. No. or minimised labour burdens for women.	Year 1 & 2	DoID	Thimphu Dzongkhag; 5 Project Gewogs of Thimphu	0	No budget requirement; the gender activities can be implemented within the activity budget.
2.2.2	Renovation of Sisilum to Khatsakha irrigation Channel (Maedwang Gewog)	Infrastructure(Rehabilitation)				Year 1 & 2	DoID	Thimphu Dzongkhag; 5 Project Gewogs of Thimphu		
2.2.3	Renovation of Sisilum to Dalukha/Dalulum Irrigation Channel (Maedwang Gewog)	Infrastructure (Rehabilitation)				Year 1 & 2	DoID	Thimphu Dzongkhag; 5 Project Gewogs of Thimphu		
2.2.4	Construction of Gangritueshay to Zanglegkha irrigation Scheme from (Genyen Gewog)	Infrastructure (Rehabilitation)				Year 1, 2, 3 & 4	DoID	Thimphu Dzongkhag; 5 Project Gewogs of Thimphu		
Outcome 3: Increased resilience of local communities to climate change through enhanced capacity in adaptation planning and implementation										
Component 3: Capacity of local communities and organizations on knowledge and skills related to sustainable water resource management, local climate adaptation planning and implementation enhanced.										
Output 3.1: Community based Water User Associations (WUAs) strengthened for effective management of irrigation and drinking water.										
Activity		***Activity description***			***Gender concerns, gap and needs***	***Gender Action***	***Target/Indicator***	***Time/year***	***Responsible agency***	***Collaborating agency***	***Budget (USD)***	**Budget Description**
		Sub-Activity		***Activity type***								
3.1.1	Strengthen and enhance community engagemen	3.1.1 (a)	Community engagement and	Meetings/Consultations	* Equal involvement and engagement of women and girls in the consultations; * Organisation of consultations and workshops at a convenient time and place to provide equal access and	1. Women and girls actively involved and engaged in the consultations; 2. Deign the workshops and consultations with sessions on	1. Number of women (30%) and men participating the consultations and workshops; 2. Sessions on gender-based	Y3 (Q1, Q2, Q3, Q4)	DoW	DLGDM; Thimphu Dzongkhag; 5 Project Gewogs of Thimphu	0	No budget requirement; the gender activities can be implemented

	t in WUAs establishment		WUA establishment or strengthening.		opportunity for participation by women and men. * Provide necessary facilities and support to women with barriers for participation, e.g women with infants, caregiving works, household chores burden. * Sensitisation and emphasis on gender-equality and equal participation of women and men in WUA, based on different climate-change impacts on women and men due to gendered roles in the community. * Facilitation of consultations and workshops by women to give women participants confidence in discussing women's needs, challenges and solutions. * Inclusion of women in WUAs; * Women friendly WUA management guideline, SoPs, and bylaws.	gender-based climate-change impacts due to gendered roles in the community; 3. Include females in the team of facilitators. 4. Plan and organise the workshops and consultations at a place and time that will enable women and girls to participate and have equal access to trainings and workshops. 5. Provide necessary facilities and support to women with barriers for participation, e.g women with infants, caregiving works, household chores burden. 6. Inclusion of women in WUAs; 7. Women friendly WUA management guideline, SoPs, and bylaws.	climate-change impacts due to gendered roles in the community, and women's empowerment included in the workshop and consultation curriculum. 3. No. of female facilitators engaged in each consultation and workshops; 4. Type and kind of facilitation support provided to give access to females with barriers to participation in the consultations and workshops. 5. No. of women in WUAs; 5. Gender-based participation and requirements included in WUA guideline and bylaws.					within the activity budget.
		3.1.1 (b)	Conduct training workshops on project management, financial management and monitoring and evaluation on skills for community-based water user groups.	Training of WUA office bearers	* Gender equality in participation in trainings and workshops. * Organisation of training at a convenient time and place accessible by both women and men members to provide equal access and opportunity to participate. * Sessions on gender-based climate-change impacts due to gendered roles in the community, and women's empowerment included in the workshop and consultation curriculum. * Facilitation of community meetings by women to give women participants confidence in discussing women's needs, challenges and solutions, and to understand women's concerns and needs by women.	* Involve equal number of women and men in the capacity-building workshops and trainings. * Organise trainings at a time and place convenient to both women and men members, ensuring equal access and opportunity for participation. * Sensitisation and emphasis on gender-equality, women's leadership roles and empowerment in WUA management; * Facilitation by women to give women participants confidence in discussing women's needs, challenges and solutions, and to understand women's concerns and needs by women.	* No. of women (30%) and men participating in the trainings/workshops. * Importance of gender-equality and need for equal participation of women and men in WUA included in the curriculum; 3. No. of female facilitators engaged in each consultation and workshops; 4. Type and kind of facilitation support provided to give access to females with barriers to participation in the consultations and workshops.	Y3 (Q1, Q2, Q3, Q4)	DoW	DLGDM; Thimphu Dzongkhag; 5 Project Gewogs of Thimphu	0	No budget requirement; the gender activities can be implemented within the activity budget.
Output 3.2: Capacity of local communities, local leaders and organizations enhanced on local adaptation planning and implementation.												
Activity		***Activity Description***			***Gender concerns, gap and needs***	***Gender Action***	***Target***	***Time/year***	***Responsible agency***	***Collaborating partners***	***Budget (USD)***	**Budget Description**
		Sub-Activity		***Activity type***								
3.2.1	Capacity building on climate	3.2.1 (a)	Capacity building of Local	Training/workshop	* Gender equality in participation * Capacity building training time and place may not be conducive to female	1. Encourage and involve participation of female LG functionaries.	1. No. of female and male LG functionaries in training.	Y2 (Q4); Y3 (Q4).	DLGDM	Thimphu Dzongkhag; 5	0	No budget requirement; the gender activities

	change adaptation, planning and implementation for local leaders and communities		Government functionaries on mainstreaming GECDP into local plans and programs.		LG functionaries because of which some female LG functionaries may not be able to participate. * A female facilitator/trainer may be more useful in sharing experiences, challenges and solutions. * Participatory and gender-balanced training sessions and materials. * Gender-balanced participation and discussion.	2. Plan and conduct trainings at a time and place conducive to both women and men, especially the female LG functionaries. 4. Include female facilitator/trainer for free discussion and experience-sharing by female LG functionaries. 5. Adequate training sessions and materials on gender-based discussions.	2. At least one female facilitator/trainer engaged.			Project Gewogs of Thimphu		can be implemented within the activity budget.
		3.2.1 (b)	Development of GECDP curriculum	Local Consultancy	* Incorporation of gender-equality, gender-based needs and gender-mainstreaming strategies, focusing on affirmative approach to women's leaderships roles and empowerment	1. Ensure incorporation of gender-equality, gender-based needs and gender-mainstreaming strategies, focusing on affirmative approach to women's leaderships roles and empowerment, in the curriculum.	1. Training curriculum developed and implemented.	Y1 (Q1)	DLGDM	Thimphu Dzongkhag; 5 Project Gewogs of Thimphu	0	No budget requirement; the gender activities can be implemented within the activity budget.
		3.2.1 (c)	Establishment of Community Engagement Platform in 5 targeted Gewogs of Thimphu.	Training/workshop	* Equal number of women and men in CEP membership and registration. * Sensitisation and training of CEP members on gender-equality and gender-based operation of CEP. * Female CEP members in leadership roles of CEP management and functioning. * Gender concerns and issues discussed and resolved in CEP.	1. Promote and involve equal number of women and men in CEP membership and registration. 2. Sensitise and train CEP members on gender-equality, gender-based operation of CEP, and mainstreaming gender in CEP's activities. 3. Encourage females to take leadership roles of CEP management and functioning. 4. Inclusion of gender equality, promotion of women and gender-based community development as CEP's strength.	1. No. of women (30%) and men in CEP membership and registration. 3. Requirement for promotion of gender-equality, gender-based CEP operation and gender-mainstreaming included in CEP's management and operation manual/ToR/SOP. 2. No. of women in CEP leadership roles.	Y1 (Q2); Y2 (Q2;	DLGDM	Thimphu Dzongkhag; 5 Project Gewogs of Thimphu	5,000	Costs of 2-day sensitisation and trainings for relevant men and women from five project Gewogs. Participants' perdiem, accommodations, travel allowances, working lunch and refreshments, miscellaneous expenses.
3.2.2	Conduct training workshops on project management; financial management; advocacy and communication skills for local leaders to strengthen the	3.2.2 (a)	Provide capacity-building training on project management, financial management, and communication and advocacy skills	Training/workshop	* Gender equality in participation by men and women. * Project Management training: include methods of conducting gender analyses to identify the different needs, vulnerabilities, and workloads of men and women before project design; inclusive stakeholder engagement in community consultations, community participation and decision-making; importance and need to collect and use quantitative and qualitative gender data for setting realistic project targets and conducting gender-sensitive M&E. * Financial management training: include Gender-Responsive Planning and Budgeting (GRPB), tracking gender-	1. Enable equal access and opportunity for all female and male LG functionaries to participate in the training. 2. In Project Management, include sessions on strategies of conducting gender analyses; inclusive stakeholder engagement in community consultations, community participation and decision-making; collection and use of quantitative and qualitative gender data for setting realistic project targets and conducting gender-sensitive M&E. 3. In Financial management training, include GRPB, gender-	1. No. of women (30%) and men sensitised and trained. 2. Training curriculum and sessions are gender-responsive.	Year 3 (Q3;)	DLGDM	Thimphu Dzongkhag; 5 Project Gewogs of Thimphu	0	No budget requirement; the gender activities can be implemented within the activity budget.

	organizational and leadership skills.		for Gups, GAOs, Mangmis, concerned Tshogpas, PEDs, and Accountants.		based budget allocations and expenditures, analysis of different impact of funded social services on women and men, and, social auditing, social accountability of financial administration. * Inclusive public communication: focus on using gender-sensitive language in local policy documents, meeting minutes, and public awareness campaigns, etc, while advocating against structural barriers, entrenched social norms, and GBV; * Emphasise on sensitising both women and men on the importance of equipping local women leaders with public speaking, negotiation, and media training to effectively represent their constituents.	based budget allocations and expenditure tracking, analysis of gender-based impact of social services; social auditing, social accountability. 4. Focus on using gender-sensitive language public communication, local policy documents, meeting minutes, and public awareness campaigns, etc; advocacy against structural barriers, entrenched social norms, and GBV; 5. Sensitises both women and men on the importance of equipping local women leaders with skills on public speaking, negotiation, and media training to effectively represent their constituents.						
3.2.3	Capacity building for engineers and technicians	3.2.3 (a)	Training on sustainable Management of Water Supply (Rural & Peri-Urban)- for technicians and engineers.	Training/Workshop	Such trainings should integrate Gender Equality and Social Inclusion (GESI) frameworks into technical curricula. This will ensure that the infrastructure designs accommodate different physical, socioeconomic, and cultural realities, addressing women's disproportionate vulnerability to water insecurity and their underrepresentation in technical water management. Integrating gender into water supply management training will help address distinct concerns and needs.	Include the following in the training sessions: * Importance and need to consult both men and women on the placement, height, and design of communal taps and water points to ensure safety and usability; * Accounting for well-lit approaches and safe zones around water infrastructure to prevent risks of gender-based violence during water collection; * Design water supply systems to enable women to access water access for small-scale agriculture or livestock, besides basic household water needs. * Equipment like hand pumps, valves, and water meters must be designed or selected so they are physically operable by women as well as men; * Value-additions of recruitment of paid women caretakers and technicians to bridge the gender gap in technical roles. * O&M manuals and training must use clear language, visual aids, or local dialects, to help committee members with lower literacy rates.	1. No. of women and women participating in the training. 2. Gender-based training sessions included.	Year 2 (Q1)	Thimphu Dzongkhag; 5 Project Gewogs of Thimphu	MoIT	0	No budget requirement; the gender activities can be implemented within the activity budget.
		3.2.3 (b)	Capacity building of	Training/Workshop	Besides purely technical aspects, engineers must be trained to design gender-responsive infrastructure to	Include the following aspects in the training sessions or curriculum: 1. Integration of varying needs of	1. No. of females and males participating in the training. 2. Gender-responsive training	Year 1 (Q2)	Thimphu Dzongkhag; 5 Project	MoIT	0	No budget requirement; the gender activities

			engineers on design of water supply & Irrigation systems		meet the diverse needs of women and men, such as fair and equal accessibility to tap locations, domestic water storage within irrigation systems, and equitable water rights. Training programme must integrate gender-responsive approach to address social dimensions—such as women's specific domestic and productive water needs, land ownership barriers, and diverse household roles—to prevent faulty designs and project failures.	men and women in the design conceptualization, by carrying out sex-disaggregated stakeholder analysis, and participatory consultations to gather input from women, the landless, and marginalized groups. 2. Planning and design of water points and irrigation control mechanism (e.g., tap heights, valve ease of use, and canal layouts) in a manner that is accessible and safe for women and children to operate. 3. Promotion of the design of governance structures that ensure meaningful participation and leadership roles for women in local Water User Associations (WUAs).	curriculum, with incorporation of gender-based needs of women and men that enables equal operation, maintenance and benefit sharing.		Gewogs of Thimphu			can be implemented within the activity budget.
3.2.4	Capacity building training workshop for communities on integrated water resource management and sustainable agricultural practices.	3.2.4 (a)	Conduct capacity-building programs for farmers on sustainable agricultural practices, climate-smart technologies, and resource-efficient farming	Training/Workshop	* Compared to men, women typically have less access to land, credit, modern farming equipment, and weather advisories. Men-biased property rights often prevent them from investing in long-term, sustainable land management practices. * Most CSA practices (e.g., contour farming or digging pits) are highly labour-intensive. Without access to mechanized tools, CSA increases the workload for women, who are already responsible for unpaid domestic labour and child-rearing alongside agricultural work. * Agricultural decision-making and control is normally done by men, making men to dominate the income generated from cash crops and advanced technologies. This leaves women to focus on lower-value subsistence farming while lacking control over financial benefits	1.Tailor the trainings by scheduling at times convenient for women and delivered by methods that accommodate potentially lower literacy levels or lack of digital access. 2. Proved trainings based on targeted group, like women's farming cooperatives, or use peer-to-peer learning and knowledge sharing. 3. Include gender-responsive training sessions including strategies on subsidising climate-smart technologies, such as solar-powered irrigation or less labour-intensive water harvesting mechanisms to reduce time and energy burdens of women.	1. No. of women (30%) and men participated in CSA and sustainable farming practices. 2. Gender-responsive training session. 3. No. of households implementing CSA technologies.	Year 1 (Q2,Q3 & Q4); Year 2 (Q2&Q4); Y3 (Q2, Q3 & Q4)	Thimphu Dzongkhag; 5 Project Gewogs of Thimphu	DoA	0	No budget requirement; the gender activities can be implemented within the activity budget.
		3.2.4 (b)	Provide training to extension agents on sustainable agricultural practice	Training/ Workshop	* Include female extension agents; * Training should include sessions on gender equality, gender-based agricultural practices and use of sex-disaggregated data to understand differential impact to women and men by the poor soil health, water availability and increased pest.	1. Include female extension agents; 2. Include gender equality, gender-based agricultural practices and use of sex-disaggregated data in the training sessions to understand differential impact to women and men by the poor soil health, water availability and increased pest.	1. No. of female extension agents participated in the training. 2. Gender equality, gender-based agricultural practices and use of sex-disaggregated data to understand differential impact to women and men by the poor soil health, water availability and increased pest, included in	Year 1 (Q3),; Year 2 (Q2 & Q3); Year 3 (Q4)	Thimphu Dzongkhag; 5 Project Gewogs of Thimphu	DoA	0	No budget requirement; the gender activities can be implemented within the activity budget.

			s, including soil health management, water conservation, and integrated pest management.				the training curriculum and sessions					
3.2.5	Capacity building training workshop on disaster risk management including forest fires, flash floods, landslides, etc.	3.2.5 (a)	Training of LG functionaries and WUAs on climate-induced disaster risk reduction and management	Training/ Workshop	* Women and children face higher mortality and morbidity rates during disasters due to restricted mobility, limited access to early warning information, and entrenched cultural norms. * Climate-induced disasters (e.g., floods, droughts) exacerbate the burden of unpaid care and domestic work. Fetching water, caring for the sick, and securing food fall disproportionately on women. * Compared to men, women typically have less control and ownership over land, water rights, and finances. This limits women's capacity to recover economically or invest in disaster-resilient infrastructure. * Women are frequently underrepresented in WUAs and local DRR committees, resulting in the disaster recovery plans and agricultural water allocations often getting the women's specific needs overlooked.	1. Integrate gender-responsive approaches that address women's disproportionate vulnerability to hazards and their untapped potential as agents of change. 2. Prioritise pathways to promote women's inclusion in decision-making and leadership positions in WUAs and local disaster management committees, ensuring their voices shape risk-informed development. management. 3. Train LG functionaries on the importance and need to collect and utilize sex-and-age-disaggregated data to assess differentiated vulnerabilities, inform local preparedness plans, and target climate finance accurately. 4. Tailor risk communication and evacuation drills to overcome social norms and reach women directly. 5. Include in the training gender-responsive recovery operations, such as ensuring safe emergency shelters and planning for emergency water supplies to reduce women's security risks.	1. No. of female and male LG functionaries participated in the training. 2. Gender-responsive training curriculum, including approaches that address women's disproportionate vulnerability to hazards, pathways to promote women's inclusion in decision-making and leadership positions in WUAs and local disaster management committees, and collect and utilize sex-and-age-disaggregated data to assess differentiated vulnerabilities.	Year 2 (Q3)	DLGDM	Thimphu Dzongkhag; 5 Project Gewogs of Thimphu; DoW	0	No budget requirement; the gender activities can be implemented within the activity budget.
Output 3.3: Project Results and Lessons Learned disseminated effectively.												
Activity		***Activity Description***			***Gender concerns, gap and needs***	***Gender Action***	***Target***	***Time/year***	***Responsible agency***	***Collaborating agency***	***Budget (USD)***	**Budget Description**
		Sub-Activity		***Activity type***								
3.3.1	Organize community forums and workshops	3.3.1 (a)	Facilitate Participatory	Workshop/ seminar	* Gender equality in participation. * Include gender-based learning and experience-sharing programmes,	1. Include both women and men 2. Include in the exchange programme, gender-based learning and experience-sharing.	1. No. of women and men participated in the learning exchange visits. 2. Type of gender-based	Quarterly; Annually	PMU	Executing agencies	0	No budget requirement; the gender activities can be

	to share experiences and lessons learned		Learning, Knowledge Exchange, and Exposure Visits (both within & Ex country) among project stakeholders, including community members, local leaders, and implementing partners.		including challenges faced by women and mitigations implemented.		issues and challenges discussed.					implemented within the activity budget.
3.3.2	Knowledge products developed, disseminated and utilized via knowledge sharing platform	3.3.2 (a)	Develop project brochures, briefs and dissemination	Communication materials	* Dissemination of gender-related activities and best practices	1. Include gender-related best practices and success stories	1. No. and type of gender-related best practices and success stories disseminated.	Quarterly; Annually	PMU	Executing agencies	0	No budget requirement; the gender activities can be implemented within the activity budget.
3.3.3	Regular Monitoring and Evaluation of project results	3.3.3 (a)	Monitoring and Evaluation of GAP activities	Monitoring visits, reporting, etc				Quarterly; Annually	PMU	Executing agencies	0	No budget requirement; the gender activities can be implemented within the activity budget.
										Total GAP Budget	**39,800**	

4. Budget Notes for GAP activities

Project Activity	GAP activity description	GAP activity output	Budget (USD)	Expenditure Areas
1.1.1 (a)	• Sensitisation and training for Water Policy drafting taskforce members on mainstreaming gender by integration of gender-based concerns, needs and gender equality measures in the policy. • Sensitisation and training for policy screening task force members on screening the draft policy from gender lens and gender-equality approach.	• Revised water policy addresses gender-based concerns, needs and gender equality measures, indicated through clear gender-responsive statements in the policy. * Revised water policy is screened from gender lens, and water policy is gender responsive.	3,300.00	Two-day training for 8 to 11 members = gender expert/trainer fees; participants perdiem and accommodation charges; hall charges, working lunch/refreshments; participants' transportation/communication allowances; miscellaneous expenses.
1.1.2 (a)	• Carry out comprehensive gender analysis/assessment, and develop/implement Gender (Equality) Action Plan.	• Implementation of Wangchu River Basin Management Plan includes a gender equality action plan, informed by a comprehensive gender analysis carried out to assess and address gender concerns, gaps and needs.	5,000.00	Costs of: gender analysis study and development of action plan; gender analysis finding consultation and validation workshops; workshop on validation and operationalisation of gender action plan.
1.1.4 (b)	• Targeted sensitisation and training workshops to ensure all affected men and women of EbA measures have the required knowledge and skills on the EbA measures implemented, including risks prevention and mitigation measures. Sensitisation includes	• Both women and men affected or involved in the use of EbA measures have equal access and opportunities of participation and benefit-sharing from the EbA measures, and gender concerns, needs and gaps identified by the gender analysis carried out for the activity are fully incorporated.	5,000.00	Costs of validation on findings of gender analysis carried out for EbA measures, and training of affected stakeholders on equal access to EbA resources, participation and benefit-sharing. 2-day sensitisation workshops with participants from five project Gewogs; Resource person's fees; participants perdiem and accommodation charges; hall charges, working lunch/refreshments; participants' transportation/communication

				allowances; miscellaneous expenses.
1.1.4 (c)	• Sensitise relevant local women and men, and LG functionaries on the use of microclimate and meteorological stations for informed decision-making in climate-change adaptation. Trainings will include how women and men can access and utilise weather and water-level alerts to inform climate services; dissemination to uphold gender roles in influencing how people receive information through customised messaging.	• Relevant local women and men, and LG functionaries are able to understand and make informed-decision based on effective access and use of weather and water alerts; • Capacity of local men and women built on their respective roles and participation in climate services through use of climate information from microclimate and meteorological stations.	5,000.00	Costs of 2-day sensitisation and trainings for relevant men and women from five project Gewogs. Participants' perdiem, accommodations, travel allowances, working lunch and refreshments, miscellaneous expenses.
1.2.1 (e)	• Sensitisation of local women and men on the guideline, to inform gender-based needs, including women's engagement and roles in decision-making in climate-resilient water and water-related services.	• Participation and engagement of local women and men in decision-making enhanced, and their resilience to climate and water induced stresses strengthened as a result of effective use and implementation of the guideline.	5,000.00	Costs of 2-day sensitisation and trainings for relevant men and women from five project Gewogs. Participants' perdiem, accommodations, travel allowances, working lunch and refreshments, miscellaneous expenses.
1.2.2 (a)	• Capacity-building sensitisation and training for local men and women the on use and implementation of DPRP guideline/framework, including monitoring and reporting of response needs based on differential impacts on women and men; gender-responsiveness of early warning systems in terms of access to gender-	• Project community members and LG institutions are resilient to climate-induced drought. • Access to drought-resistant technologies by local project beneficiaries, especially the vulnerable and disadvantaged women and girls, enhanced. • GBV incidences during drought prevented	6,500.00	Costs of 2-day sensitisation and trainings for relevant men and women from five project Gewogs. Participants' perdiem, accommodations, travel allowances, working lunch and refreshments, miscellaneous expenses.

	sensitive drought-resistant technologies; minimisation of risks for GBV and burdens of unpaid care work during drought.	and women's burden reduced.		
1.3.2 (a)	• Training and capacity-building for women and men to equip them with technical skills, and empower local women in operation of pumps and manage reservoir levels for their climate resilience.	• Local women and men in the project areas are able to operate pumps, and manage reservoir levels;* No. of forest fire incidences in the project Gewogs reduced. • Community resilience on forest-fire related disaster enhanced.	5,000.00	Costs of 2-day sensitisation and trainings for relevant men and women from five project Gewogs. Participants' perdiem, accommodations, travel allowances, working lunch and refreshments, miscellaneous expenses.
3.2.1 (c)	• Sensitise and train CEP members on gender-equality, gender-based operation and management of CEP, and mainstreaming gender in CEP's activities.	• CEP operation and management is gender-responsive. • Gender equality in five project Gewogs strengthened and enhanced as a result of CEP's gender-responsive roles, empowerment of women and promotion of gender-based CEP activities.	5,000.00	Costs of 2-day sensitisation and trainings for relevant men and women from five project Gewogs. Participants' perdiem, accommodations, travel allowances, working lunch and refreshments, miscellaneous expenses.
GAP Total Budget			**39,800.00**	

5. GAP Monitoring and Reporting

Implementation of GAP activities and their progress will be monitored periodically through the project monitoring and evaluation system. NIE will take the oversight role in monitoring and reporting on the GAP activities. A dedicated Gender Expert will monitor the GAP in close collaboration with PMU, and executing agencies. Reporting on GAP activities will be done through:

- Annual project performance reports
- Mid-term project evaluations
- Final project evaluation reports

6. Institutional Arrangements

Gender mainstreaming will be supported through the following arrangements:

- Appointment of a Gender Focal Point within the Project Management Unit or engagement of independent Gender Expert for the project.
- Capacity-building activities for project staff and partners by Gender Expert on GAP and gender mainstreaming/equality strategies.
- Integration of gender indicators into the project results framework.

ENVIRONMENTAL AND SOCIAL SAFEGUARDS (ESS)

RISK SCREENING

AND

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Securing Water and Enhancing Climate Resilience in Thimphu (Rural) District, Bhutan

Adaptation Fund

Bhutan Trust Fund for Environmental Conservation (BTFEC)
July 2026

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1. Introduction and Purpose

This document presents the Environmental and Social Safeguards (ESS) Screening and Environmental and Social Management Plan (ESMP) for the project "Securing Water and Enhancing Climate Resilience in Thimphu (Rural) District," proposed for financing under the Adaptation with the Bhutan Trust Fund for Environmental Conservation (BTFEC) as the National Implementing Entity.

The purpose of this document is twofold: Part 1 (ESS Screening) which assesses the project's outcomes, outputs, activities and sub-activities against the Adaptation Fund's 15 Environmental and Social Policy (ESP) principles and proposes a project environmental and social risk category. Part 2 (ESMP) sets out, for every activity and sub-activity, the identified environmental and social risks, their likelihood and impact, the management/mitigation measures required, the estimated cost of each measure, the responsible implementing party, and a verifiable indicator, consistent with the Adaptation Fund Environmental and Social Policy (approved November 2013, amended March 2016) and the Fund's ESMP Guidance Document.

The assessment draws on: (i) the project's consolidated activity and results framework; (ii) the Adaptation Fund's ESS Requirements; (iii) a household survey of 231 respondents conducted in the five target Gewogs (Kawang, Geney, Mewang, Dagala and Chang) of Thimphu Dzongkhag; (iv) Community consultations and participatory ESS risk screening (iv) forest cover and fire-sensitivity data for the target Gewogs; and (v) general environmental and social safeguards practice and regulatory requirements in Bhutan, including the National Environment Protection Act 2007, the Environmental Assessment Act 2000, the Forest and Nature Conservation Act 1995 and Rules 2017, the Water Act of Bhutan 2011, and the Land Act of Bhutan 2007.

1.1 Project Information

Project Title: **Securing Water and Enhancing Climate Resilience in Thimphu (Rural) District**

Project Area: Chang, Mewang, Kawang, Dagala and Genekha Gewogs, Thimphu Dzongkhag, Bhutan. This ESMP follows the structure and safeguard logic as applied to specific project activities.

Implementing Entity: Bhutan Trust Fund for Environmental Conservation (BTFEC).

Project Objective: The project combines ecosystem-based adaptation, water governance, climate-resilient drinking water and irrigation infrastructure, forest fire risk management, and community capacity strengthening to improve water security and resilience in Thimphu Dzongkhag.

The project comprises three components implemented over the four year project period):

Component 1 - Ecosystem-based Adaptation (EbA) to strengthen natural capacity for water infiltration, recharge and buffering (Outputs 1.1-1.3), covering water resource governance, EbA/sustainable land management, and forest fire risk management.

Component 2 - Community-based climate-resilient drinking water and irrigation infrastructure (Outputs 2.1-2.2), covering five new drinking-water supply schemes (Woluna, Changtagang, Helela-Chamgang, Domtshang Ney-Khasadrapchu, Rama; 764 households / 5,747 people) and four irrigation schemes (Lower Woluna/Danglo, Dalukha-Khasakha, Dalukha-Dalulum, Gangritueshay-Zangleykha; 254 households / 1,038 people, approx. 429.5 acres).

Component 3 - Capacity of local communities and organizations on water resource management, adaptation planning and implementation (Outputs 3.1-3.3;), covering Water User Association (WUA) strengthening, capacity building of local leaders/engineers/farmers, and knowledge dissemination/M&E.

Project Risk Category:

Project Category	Category B
ESP Principles Triggered	
Total AF ESP Principles Screened	**15**
Principles Triggered (Yes)	**15**
Principles Not Triggered (No)	**0**
Risk Significance Distribution — ESMP Activities & Cross-Cutting Measures (90 of 91 items screened)	
Risk Significance	**Likelihood* Impact**
Low	**24**
Medium	**66**
High	**0**
Total risk items	**90**
ESMP Mitigation Budget Breakdown (USD)	
Budget Line	**Amount**
Sub-total: Activity-Level ESMP Mitigation Cost	**25,950.00**
Sub-total: Cross-Cutting Measures	**61,000.00**
GRAND TOTAL: ESMP Mitigation Cost	**86,950.00**

1.2 Description of Project Locations and baseline conditions

The project area covers Chang, Dagala, Genye, Kawang, and Mewang Gewogs in Thimphu Dzongkhag, with a project focus on agriculture, domestic water security, ecosystem-based adaptation, and watershed functions. These Gewogs sit within a highly diverse mountain landscape, with sharp contrasts between more settled, built-up areas such as Chang and more extensive alpine, meadow, shrub, and forest-dominated areas such as Mewang, Kawang, Dagala, and Genye.

Genye Gewog

Landscape and land use: Genye is relatively agriculture-oriented, with farming settlements depending closely on forested and upland catchments for irrigation and domestic supply. It lies within a mid-altitude landscape (roughly 2,000–3,000 m) of lush forests, fertile valleys and gentle hills, with the Gangritueshay catchment and existing open reservoirs supporting irrigation. The 2020 land-use data show about 484 ha of agriculture, 4,324 ha of alpine scrub, 1,016 ha of meadows, 1,480 ha of shrubs, and very limited mapped water bodies; the forestry dataset records about 4,551.94 ha of forest — substantially lower than Kawang, Mewang, or Dagala, but still ecologically important for source protection and slope stabilization.

Population and beneficiary baseline: The gewog's PHCB 2017 population is 1,141 persons (gender split to be confirmed from the primary PHCB table). For the proposed integrated irrigation and water supply scheme (Section B, Component 2.2.4: Gangritueshay–Zangleykha) serving Genekha, Zangleykha, and Chizhi chiwogs, the beneficiary baseline is 240 households and 446 people (234 males, 212 females). This means the scheme targets roughly 39% of the gewog's total population — a materially significant share, not a marginal one, once the corrected population figure is used.[1]

[1]Population and Housing Census of Bhutan (PHCB) 2017, Thimphu Dzongkhag gewog-level data, https://www.citypopulation.de/en/bhutan/admin/BT014__thimphu/

Household survey evidence (n=60): 70% of respondents rely on individually piped connections as their main drinking water source, with the remainder on community taps or spring/river sources; irrigation is split between canal (roughly 40%) and other/unimproved sources (40%). 78% of households reported experiencing water shortages "often" or "sometimes" in the past 12 months — the second-highest shortage rate among the five gewogs. WUA membership stands at only 50% (30 of 60), the lowest of the five gewogs, consistent with the earlier consultation finding that chiwog-level WUAs here are weak and unregistered with the DoW. Despite this, satisfaction with current water management is comparatively high (95% "very" or "somewhat satisfied"). 15% of respondents reported sacred/religious sites near intake structures — relevant given Chizhi Gompa's proximity to the scheme alignment — and 20% reported existing or planned structures on or very close to their own land.[2]

Social and institutional baseline, including community consultation findings: Villages show strong cohesion, including Genekha, Zangleykha, Chizhi, and Tshochaykha. A near gender-balanced population participates actively in community meetings — 88% of survey respondents in Genye consider gender-balanced participation important — but WUAs remain informal and unregistered. Site-level risk consultations at Chizhi Gompa/Zangleykha identified that the scheme's proposed end point, located above Chizhi Gompa inside the village boundary on a steep slope top, coincides with the natural drainage pathway and is highly flood-prone; if the alignment runs above Zangleykha, overflow would trigger downstream flooding affecting the local school, main access road, Zangley village, and Samtsang. The Zanglan, Chizhipa, and Chizhilung/Genkha tanks were separately flagged as high flood-risk structures, and clearances are required from Chizhi Gompa (monastic body) and Samtsang village, alongside standard WUA/community clearance. Communities also practice "Gyen" (rotational responsibility for community-asset maintenance) and "Dedrik" (customary land-boundary adjustment to enable siting of community infrastructure).

Livelihoods: Farming and livestock are primary livelihoods, complemented by harvesting high-value forest products such as wild matsutake mushroom, and small but growing eco-tourism linked to nearby trekking routes.

Linkage to project interventions and ESS baseline: These conditions support emphasis on intake and alignment protection, climate-smart irrigation management, formal WUA registration and strengthening, watershed management, and localized erosion-control measures — with tail-end overflow to be managed via a piped outlet into the natural drain on the left bank of Chizhi Goenpa. Given the proximity to Chizhi Gompa and the reported (if minority) presence of sacred sites near intakes, Physical and Cultural Heritage safeguards (AF Principle 14) and Lands and Soil Conservation measures (Principle 15) are directly triggered here.[3]

Kawang Gewog

Landscape and land use: Kawang is a transition landscape between Thimphu's urban fringe and higher rural catchments, highly relevant for domestic water security, settlement drainage, and water source-area management. It is semi-rural, north of Thimphu Thromde, with forested slopes and streams such as Nimashong feeding settlements including Changtagang and Gasabarma. Land-use data indicate about 242 ha of agriculture, 2,365 ha of alpine scrub, 1,306 ha of meadows, 991 ha of shrubs, about 697 ha of snow and glacier, and 111 ha of water bodies; the forestry dataset shows about 24,383.61 ha of forest — the largest among the five gewogs, with strong representation of blue pine, evergreen oak, fir, hemlock, and spruce.

[2]Household Survey — Securing Water and Enhancing Climate Resilience in Thimphu (rural) District (Responses), n=231, 221 classifiable across five project gewogs (project file, BTFEC_LLA_AF space)
[3]ESS_Requirements of AF.docx — Adaptation Fund Environmental and Social Policy (ESP), 15 principles (project file, BTFEC_LLA_AF space)

Population and beneficiary baseline: PHCB 2017 population: 5,477 persons (3,185 males, 2,292 females) — confirmed against census sources. The Changtagang drinking water supply scheme (Component 2.1.2) targets 98 households and 1,208 direct beneficiaries (820 males, 388 females).[4]
Household survey evidence (n=73, largest sample of the five gewogs): Drinking water sources are nearly evenly split between community taps (49%) and individual piped connections (41%). WUA membership is comparatively strong at 73% (53 of 73), and traditional water institutions in Kawang most frequently name the WUA directly (15 mentions) alongside village committees — more than any other gewog. However, satisfaction is more mixed than elsewhere (73% very/somewhat satisfied, but 18% "don't know" — the highest uncertainty rate of the five gewogs), and only 38% of respondents felt "always safe" from harassment at water points, the lowest of the five gewogs, alongside a high 41% "don't know" response — both signalling a need for explicit gender-based-violence/SEAH risk mitigation in Kawang's scheme design. 68% reported experiencing shortages "often" or "sometimes."[5]
Social and institutional baseline: A mixed semi-urban and rural settlement with strong multi-chiwog participation; gender-balanced attendance in consultations but low female representation in WUA leadership.

Livelihoods: Agriculture and livestock remain central, complemented by small businesses and emerging tourism.

Linkage to project interventions and ESS baseline: Activities should be framed as both water supply improvement and integrated catchment/settlement-risk management — drainage, fire-sensitive blue pine belts (Principles 9 and 11), erosion-prone sections (Principle 15), more inclusive WUA governance, and explicit safe-access/SEAH prevention measures given the survey's harassment-safety findings (Principle 5).[6]

Dagala Gewog

Landscape and land use: Dagala is a high-altitude watershed and pasture landscape (roughly 2,400–3,000 m and above) with rugged mountains, rich pastures, forests, and sensitive watersheds, including the Helela (Chu Sap and Lum Jangsa) catchments. It has sparse settlement, very limited agricultural land, and strong dependence on perennial natural sources. Land-use profile: about 1.3 ha of agriculture, 1,029 ha of alpine scrub, 1,800 ha of meadows, 672 ha of shrubs, and 613 ha of rocky outcrops; forestry data record about 14,209.18 ha of forest, much of it fire-sensitive, with a smaller broadleaved component.

Population and beneficiary baseline: PHCB 2017 population: 2,094 persons (1,387 males, 707 females) — confirmed. The Helela–Chamgang water supply scheme (Component 2.1.3) serves Chamgang Toed, Chamgang Maed, Wangdro, and Dungdro chiwogs — 167 households, 2,062 direct beneficiaries (1,372 males, 690 females). This scheme's beneficiary count is nearly equivalent to the entire gewog population, confirming this intervention is effectively gewog-scale.[7]
Household survey evidence (n=11, smallest sample — findings indicative only): Community water taps dominate (64%) over individual piped connections. WUA membership is the lowest recorded at 45% (5 of 11), consistent with the finding that Dagala's WUAs are not formally registered with the DoW. Despite this, 91% felt "always safe" from harassment at water points — the highest of the five gewogs —

[4]Population and Housing Census of Bhutan (PHCB) 2017, Thimphu Dzongkhag gewog-level data, https://www.citypopulation.de/en/bhutan/admin/BT014__thimphu/
[5]Household Survey — Securing Water and Enhancing Climate Resilience in Thimphu (rural) District (Responses), n=231, 221 classifiable across five project gewogs (project file, BTFEC_LLA_AF space)
[6]ESS_Requirements of AF.docx — Adaptation Fund Environmental and Social Policy (ESP), 15 principles (project file, BTFEC_LLA_AF space)
[7]Population and Housing Census of Bhutan (PHCB) 2017, Thimphu Dzongkhag gewog-level data, https://www.citypopulation.de/en/bhutan/admin/BT014__thimphu/

and 91% rated gender-balanced participation as important, also the highest. 73% reported experiencing shortages.[8]

Social and institutional baseline: Highland communities combining traditional pastoralism and small-scale agriculture, with strong participation from Chamgang Toed and Chamgang Maed chiwogs, including significant women's participation in both consultations and WUAs — though these WUAs remain unregistered.

Livelihoods: Yak herding and small-scale agriculture, supplemented by seasonal medicinal plant collection and limited tourism linked to the Dagala Thousand Lakes trek.

Linkage to project interventions and ESS baseline: Priorities are source protection, storage/conveyance reliability, monsoon erosion control, WUA registration and capacity strengthening, and climate-responsive allocation systems. As the most hydrologically significant but sparsely populated gewog, Dagala is a priority for Protection of Forests and Natural Habitats (Principle 9) and for Marginalized and Vulnerable Groups considerations (Principle 3) given its remote, highland pastoral population — while its comparatively strong safety and gender-attitude indicators suggest lower relative SEAH risk than Kawang or Chang.[9]

Mewang Gewog

Landscape and land use: Mewang combines the strongest agriculture-water livelihood profile in the project area with extensive upland terrain governing source yield, runoff, and seasonal scarcity. It has a river-valley setting along the Wangchhu, with dryland agriculture and wetland (paddy) cultivation; multiple villages face severe dry-season water stress and localized erosion/landslides near roads and drainages. Land-use data: about 976 ha of agriculture, 10,187 ha of alpine scrub, 1,452 ha of meadows, 2,889 ha of shrubs, and 77 ha of water bodies; forestry data record about 17,023.56 ha of forest.

Population and beneficiary baseline: PHCB 2017 population: 7,799 persons (corrected from 6,833; exact male/female split to be verified against the primary PHCB table or Gewog records). The three proposed schemes together target at least 761 households and about 5,450 direct beneficiaries: 966 people for Khasadrapchu drinking water (standardized spelling), 1,362 people for Woluna A and B drinking water (Component 2.1.1), and 1,122 people for Dalukha–Khasakha irrigation rehabilitation (Component 2.2.2), with Lower Woluna/Danglo (2.2.1) and Dalukha–Dalulum (2.2.3) irrigation rehabilitation expected to serve overlapping settlements. With the corrected population figure, the roughly 5,450 direct beneficiaries represent about 70% of the gewog's population — reinforcing that Mewang is both the most populous and most operationally complex project gewog.[10]

Household survey evidence (n=62): Community taps are the dominant drinking water source (52%), followed by individual piped connections (34%). WUA membership is comparatively strong at 71% (44 of 62). 89% of respondents reported water shortages "often" or "sometimes" — the highest rate among the five gewogs — directly corroborating the February–June dry-season stress noted below. 82% expressed satisfaction with WUA management despite this stress. 27% of respondents identified sacred sites near intake structures — the highest share of the five gewogs alongside Dagala — reinforcing the need for Physical and Cultural Heritage screening. This matches earlier FGD records from Dhalukha Gawa/Khasakha Goenpa (98 households; 14 participants — 8 men, 6 women, 1 person with disability), which confirmed a functioning WUA (Chairperson, Secretary, Treasurer, Chuchub; 77 eligible members)

[8]Household Survey — Securing Water and Enhancing Climate Resilience in Thimphu (rural) District (Responses), n=231, 221 classifiable across five project gewogs (project file, BTFEC_LLA_AF space)
[9]ESS_Requirements of AF.docx — Adaptation Fund Environmental and Social Policy (ESP), 15 principles (project file, BTFEC_LLA_AF space)
[10]Population and Housing Census of Bhutan (PHCB) 2017, Thimphu Dzongkhag gewog-level data, https://www.citypopulation.de/en/bhutan/admin/BT014__thimphu/

operating an 8-hour daily drop cycle, a 15-day dry-season rotation, and an 8-day Gup-managed allocation cycle.[11]

Additional consultation findings (Khasadrapchu): The Khasadrapchu FGD identified alignment conflicts requiring DGPC clearance (a stream crossing below a poultry farm intersecting existing hydropower infrastructure, and a new hydro alignment crossing near Jamina) and RSTA clearance (highway and Jemina road crossings), plus a need for water quality testing, child-safety measures at a river pipe crossing, and school-siting clearance near Khothakpa — with the realignment adding an estimated Nu. 60,000 to project cost.

Social and institutional baseline: A large, diverse population with very high consultation participation across Khasakha, Langdro, Tshaphu, Sigay, Khasadrapchu, and Woluna/Danglo — all with functional but uneven WUA structures and persistent gender imbalances in leadership.
Livelihoods: Paddy and vegetable production dominate, supplemented by other crops and semi-urban livelihoods. Water shortages from February to June constrain both production and domestic use — a pattern directly confirmed by the survey's shortage data above.

Linkage to project interventions and ESS baseline: Focus areas include domestic and irrigation water planning, intake/conveyance protection, sediment and flash-flood risk, watershed fencing, gender-responsive WUA reform, and safeguards for cumulative pressure on shared or climatically stressed sources (Principles 1, 9, 11, and 15), informed directly by the alignment-conflict and hydropower/road clearance findings.[12]

Chang Gewog

Landscape and land use: Chang is the most settlement-influenced of the five gewogs, at the rural–peri-urban interface. It is semi-rural, on the southern/eastern fringes of Thimphu Thromde, with gentle hills, fertile valleys and forested slopes; streams such as Ngabiphug and Changaphug supply domestic and irrigation water. Land-use data: about 442 ha of agriculture, 1,297 ha of built-up area, 984 ha of meadows, 1,748 ha of shrubs, and 85 ha of water bodies; forestry data record about 12,149.36 ha of forest dominated by blue pine and associated temperate types. Wildlife conflict, forest degradation, and land degradation are concerns in some areas due to pressure from Thimphu's urban expansion.
Population and beneficiary baseline: PHCB 2017 population: 6,752 persons (3,801 males, 2,951 females) — confirmed. The Rama water supply scheme (Component 2.1.4) serves 193 households and 963 direct beneficiaries (506 males, 457 females).[13]

Household survey evidence (n=15, smallest formally sampled gewog after Dagala): All 15 respondents (100%) reported WUA membership — the highest rate of any gewog — and the WUA is the most frequently cited traditional water-management institution here relative to sample size. Still, 100% of Chang respondents reported experiencing water shortages "often" or "sometimes" — tied with the highest rate in the project area. Only 47% felt "always safe" from harassment at water points — the second-lowest of the five gewogs after Kawang — again pointing to a SEAH risk-mitigation need. 33% reported structures on or near their own land, the highest share among the five gewogs, indicating Chang carries the greatest relative land-related safeguard exposure (Principle 8, Involuntary Resettlement) despite its small sample.[14]

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[11]Household Survey — Securing Water and Enhancing Climate Resilience in Thimphu (rural) District (Responses), n=231, 221 classifiable across five project gewogs (project file, BTFEC_LLA_AF space)
[12]ESS_Requirements of AF.docx — Adaptation Fund Environmental and Social Policy (ESP), 15 principles (project file, BTFEC_LLA_AF space)
[13]Population and Housing Census of Bhutan (PHCB) 2017, Thimphu Dzongkhag gewog-level data, https://www.citypopulation.de/en/bhutan/admin/BT014__thimphu/
[14]Household Survey — Securing Water and Enhancing Climate Resilience in Thimphu (rural) District (Responses), n=231, 221 classifiable across five project gewogs (project file, BTFEC_LLA_AF space)

Social and institutional baseline: Due to proximity to Thimphu Thromde, the gewog has diverse community settlements. Community-level WUAs are functional with varying levels of women's participation, relying on caretakers and Gewog officials for infrastructure monitoring.

Livelihoods: Agriculture and horticulture (apples, potatoes, vegetables), small livestock, and some commercial services.

Linkage to project interventions and ESS baseline: Interventions focus on both service delivery and risk management — intake protection, drainage management, WUA formalization, gender inclusion, and avoiding adverse impacts where semi-urban development, farmland, and source areas overlap (Principles 2, 5, 8, and 9), with particular attention to land-take documentation given the survey's elevated "structures on own land" response rate.[15]

Implications for Agriculture and Domestic Water

Taken together, the baseline — now corrected for population and cross-validated against 221 household survey responses — confirms that agriculture and domestic water security depend heavily on upstream ecosystem condition. Genye and Mewang combine agricultural relevance with large upland/forest landscapes and the highest self-reported shortage rates (78% and 89% respectively); Chang and Kawang show concentrated domestic demand with the lowest reported sense of safety at water points; Dagala remains the smallest population but the most hydrologically significant watershed landscape. Compared with the Thimphu Dzongkhag average, the project gewogs are more significant for watershed protection than their population or cultivated area alone would suggest — and with Genye's corrected population (1,141, not 5,477), its 240-household/446-person scheme now represents a proportionally much larger share of gewog-wide benefit than previously stated.

Implications for Environmental and Social Safeguards

Updated with household survey evidence, mapped against the Adaptation Fund Environmental and Social Policy (ESP) principles.

Table 1: Baseline Conditions and Their Implications for Environmental and Social Safeguards

AF ESP Principle	Baseline Evidence Across Project Gewogs
Access and Equity (2)	WUA membership ranges from 45% (Dagala) to 100% (Chang); weak/unregistered WUAs in Genye and Dagala risk unequal access pending formal registration
Marginalized and Vulnerable Groups (3)	Person with disability recorded among Mewang FGD participants; remote highland pastoral population in Dagala (n=11, smallest sample)
Gender Equality and Women's Empowerment (5)	82–93% of respondents across all gewogs consider gender-balanced participation important, yet WUA leadership remains female-underrepresented in Chang, Kawang, and Mewang; safety-at-water-points is notably low in Kawang (38% "always safe") and Chang (47%) — signalling SEAH risk-mitigation needs
Involuntary Resettlement (8)	18–33% of respondents across gewogs report structures on or near their own land, highest in Chang (33%) and Mewang (29%) — land-take documentation needed
Protection of Forests and Natural Habitats (9)	Large forest cover across all five gewogs (Kawang 24,384 ha, Mewang 17,024 ha, Dagala 14,209 ha, Chang 12,149 ha, Genye 4,552 ha)

[15]ESS_Requirements of AF.docx — Adaptation Fund Environmental and Social Policy (ESP), 15 principles (project file, BTFEC_LLA_AF space)

AF ESP Principle	Baseline Evidence Across Project Gewogs
Climate Change (11)	68–100% of surveyed households report shortages "often/sometimes"; flash floods and landslides (Genye, Mewang); fire-sensitive blue pine belts (Chang, Dagala)
Physical and Cultural Heritage (14)	15–27% of respondents report sacred sites near intakes (highest in Mewang and Dagala); Chizhi Gompa (Genye) requires formal clearance
Lands and Soil Conservation (15)	Landslide-prone segments near roads/drainages (Mewang); steep-slope alignment and erosion risk near Chizhi Gompa (Genye)

1.3 Description of National Policy and Legal Framework

The national legal and safeguard framework applicable to this project, includes the Constitution of the Kingdom of Bhutan 2008, Environmental Assessment Act 2000, National Environment Protection Act 2007, Forest and Nature Conservation Act 1995, Water Act 2011, Regulation on Occupational Health, Safety and Welfare 2012, Waste Prevention and Management Regulation 2012, Bhutan Environmental Standards, Labour and Employment Act 2007, Land Act of Bhutan 2007, Child Care and Protection Act of Bhutan 2013, National Gender Equality Policy 2020, and relevant disability inclusion and compensation provisions.

This means that environmental clearance, forestry clearance where required, consent from affected landowners, drinking water quality protection, labour compliance, equal pay, prohibition of child labour, and protection of cultural heritage remain mandatory requirements for the listed activities. The location of project's physical assets such a water related storage and pipelines are aligned to avoid or reduce private land impacts and that clearances and no-objection processes are integral to its implementation.

2. Part 1: Environmental and Social Risk Screening and Project categorization

2.1 Risk Screening Methodology

Each of the Adaptation Fund's 15 Environmental and Social Policy principles was assessed against the full set of project activities and sub-activities using Screening Checklist Questions for each principle. A principle is recorded as "triggered" where at least one activity or sub-activity has a potential to interact with the safeguard area, irrespective of the scale of that interaction. Table 2 (Section 2.2) presents the resulting checklist of triggered and non-triggered principles, and Table 3 records, for each triggered principle, a summary of the risk and the justification for that determination, drawing on the Main Sheet, the household survey and available forestry/land-cover data. Table 4 (Section 2.3) then consolidates this same risk identification at the level of each individual activity and sub-activity, recording the risk, its likelihood, impact and overall significance, ahead of the project categorization in Section 2.4.Each of the Adaptation Fund's 15 Environmental and Social Policy principles was assessed against the full set of project activities and sub-activitiesEach of the Adaptation Fund's 15 Environmental and Social Policy principles was assessed against the full set of project activities and sub-activities using using Screening Checklist QuestionScreening Checklist Questions for each principles for each principle. A principle is recorded as "triggered" where at least one activity or sub-activity has a potential to interact with the safeguard area, irrespective of the scale of that interaction. Table 2 (Section 2.2) presents the resulting checklist of triggered and non-triggered principles, and Table 3 records, for each triggered principle, a summary of the risk and the justification for that determination, drawing on the Main Sheet, the household survey and available forestry/land-cover data. Table 4 (Section 2.3) then consolidates this same risk identification at the level of each individual activity and sub-activity, recording the risk, its likelihood, impact and overall significance, ahead of the project categorization in Section 2.4.. A principle is recorded as "triggered" where at least one activity or sub-activity has a potential to interact with the safeguard area, irrespective of the scale of that interaction. Table 2 (Section 2.2) presents the resulting checklist of triggered and non-triggered principles, and Table 3 records, for each triggered principle, a summary of the risk and the justification for that determination, drawing on the Main Sheet, the household survey and available forestry/land-cover data. Table 4 (Section 2.3) then consolidates this same risk identification at the level of each individual activity and sub-activity, recording the risk, its likelihood, impact and overall significance, ahead of the project categorization in Section 2.4.

2.2 Screening Against the 15 Adaptation Fund ESP Principles

Table 2 below presents the checklist of the Adaptation Fund's 15 Environmental and Social Policy (ESP) principles against the project. A checkmark against "No” under “Triggered?” indicates the principle is not triggered. A checkmark “Yes” against "Triggered?" indicates the principle is triggered and is addressed through the mitigation measures set out in the ESMP (Part 2) and summarized in Table 4 below and consolidated in the master ESMP matrix at Table 5 (Section 3.5).Table 2 below presents the checklist of the Adaptation Fund's 15 Environmental and Social Policy (ESP) principles against the project. A checkmark against "Table 2 below presents the checklist of the Adaptation Fund's 15 Environmental and Social Policy (ESP) principles against the project. A checkmark against "No” under “Triggered?” No” under “Triggered?” indicates the principle is not triggered. A checkmark indicates the principle is not triggered. A checkmark “Yes” against "Triggered" indicates the principle is triggered and is addressed through the mitigation measures set out in the ESMP (Part 2) and summarized in Table " indicates the principle is triggered and is addressed through the mitigation measures set out in the ESMP (Part 2) and summarized in Table 33 below. below.

2.3 Screening Summary of Risks by Activity and Sub-Activity

Table 4 below consolidates, at the level of each individual project activity and sub-activity, the environmental and social risk identified during screening, its likelihood, its impact and the resulting overall significance, drawing on the same risk identification set out in the ESMP risk and mitigation matrix (Section 3.5). Significance is derived from the Likelihood x Impact rating methodology described in Section 3.4 (High on either dimension results in High significance); it is presented here to support prioritization of mitigation and monitoring effort across activities and sub-activities during screening.Table 4 below consolidates, at the level of each individual project activity and sub-activity, the environmental and social risk identified during screening, its likelihood, its impact and the resulting overall significance, drawing on the same risk identification set out in the ESMP risk and mitigation matrix (Section 3.5). Significance is derived from the Likelihood x Impact rating methodology described in Section 3.4 (High on either dimension results in High significance); it is presented here to support prioritization of mitigation and monitoring effort across activities and sub-activities during screening.Table 4 below consolidates, at the level of each individual project activity and sub-activity, the environmental and social risk identified during screening, its likelihood, its impact and the resulting overall significance, drawing on the same risk identification set out in the ESMP risk and mitigation matrix (Section 3.5). Significance is derived from the Likelihood x Impact rating methodology described in Section 3.4 (High on either dimension results in High significance); it is presented here to support prioritization of mitigation and monitoring effort across activities and sub-activities during screening.

Table 2: Screening Checklist by AF ESP Principle and Summary of Principles Triggered

Principle No	AF ESP Principle	Official ESP Principle Statement	Screening Checklist Question Applied	Triggered?	Screening Determination / Justification Summary
P1	Compliance with the Law	Projects/programmes supported by the Fund shall be in compliance with all applicable domestic and international law.	Does the project/activity require compliance with any Bhutanese national law, regulation, standard, permit, or international obligation (e.g., EIA clearance, water rights, forestry permits, building codes)?	Yes	Project activities (water infrastructure, forestry, agriculture) require domestic permits/clearances.
P2	Access and Equity	Projects/programmes supported by the Fund shall provide fair and equitable access to benefits in a manner that is inclusive and does not impede access to basic health services, clean water and sanitation, energy, education, housing, safe and decent working conditions, and land rights. Projects/programmes should not exacerbate existing inequities, particularly with respect to marginalized or vulnerable groups.	Could the project/activity restrict or fail to provide fair and equitable access to project benefits (e.g., drinking water, irrigation water, capacity building, information) to any household, community, or user group?	Yes	Household survey shows unequal access to existing water services for new settlers, remote and poor households.
P3	Marginalized and Vulnerable Groups	Projects/programmes supported by the Fund shall avoid imposing any disproportionate adverse impacts on marginalized and vulnerable groups including children, women and girls, the elderly, indigenous people, tribal groups, displaced people, refugees, people living with disabilities, and people living with HIV/AIDS. In screening any proposed project/programme, the implementing entities shall assess	Could the project/activity have a disproportionate adverse impact on marginalized or vulnerable groups (women-headed households, elderly, persons with disabilities, low-income or landless farmers)?	Yes	Elderly, disabled, isolated and very poor households face specific difficulty using water infrastructure.

Principle No	AF ESP Principle	Official ESP Principle Statement	Screening Checklist Question Applied	Triggered?	Screening Determination / Justification Summary
		and consider particular impacts on marginalized and vulnerable groups.			
P4	Human Rights	Projects/programmes supported by the Fund shall respect and where applicable promote international human rights.	Could the project/activity infringe on or fail to promote the human rights of any affected person or community (e.g., right to water, right to livelihood, right to information and participation)?	Yes	Project touches rights to water, land use and freedom from discrimination; consultations already incorporate rights-based framing.
P5	Gender Equality and Women's Empowerment	Projects/programmes supported by the Fund shall be designed and implemented in such a way that both women and men 1) have equal opportunities to participate as per the Fund gender policy; 2) receive comparable social and economic benefits; and 3) do not suffer disproportionate adverse effects during the development process.	Could the project/activity result in unequal opportunities, benefits, or adverse effects between women and men in project design, implementation, or benefit-sharing (e.g., WUA leadership, training participation, GRM access)?	Yes	Women bear the majority of water-collection and domestic burden and are underrepresented in some decision-making, but are already central users and workers.
P6	Core Labour Rights	Projects/programmes supported by the Fund shall meet the core labour standards as identified by the International Labour Organization.	Will the project/activity involve construction, civil works, or hired labour that could risk violating core ILO labour standards (child labour, forced labour, discrimination, freedom of association, occupational health and safety)?	Yes	Construction and land-development activities create risk of child labour and require OHS compliance.

Principle No	AF ESP Principle	Official ESP Principle Statement	Screening Checklist Question Applied	Triggered?	Screening Determination / Justification Summary
P7	Indigenous Peoples	The Fund shall not support projects/programmes that are inconsistent with the rights and responsibilities set forth in the UN Declaration on the Rights of Indigenous Peoples and other applicable international instruments relating to indigenous peoples.	Are there indigenous peoples or communities with customary or collective rights present in the project area whose rights could be affected by project activities?	Yes	Bhutan does not recognize legally distinct 'Indigenous Peoples' under domestic law; however, rich Indigenous and Local Knowledge (ILK) systems exist and must be respected.
P8	Involuntary Resettlement	Projects/programmes supported by the Fund shall be designed and implemented in a way that avoids or minimizes the need for involuntary resettlement. When limited involuntary resettlement is unavoidable, due process should be observed so that displaced persons shall be informed of their rights, consulted on their options, and offered technically, economically, and socially feasible resettlement alternatives or fair and adequate compensation.	Could the project/activity require land acquisition, loss of access to land or assets, or physical/economic displacement of any household or community (e.g., for intake structures, reservoirs, pipeline right-of-way)?	Yes	Small-scale, temporary land use for pipelines, intake structures, tanks, channels and small dams; no physical relocation anticipated.
P9	Protection of Natural Habitats	The Fund shall not support projects/programmes that would involve unjustified conversion or degradation of critical natural habitats, including those that are (a) legally protected; (b) officially proposed for protection; (c) recognized by authoritative sources for their high	Could the project/activity cause conversion or degradation of critical natural habitats (e.g., forests, wetlands, riparian zones, protected areas) through water infrastructure, forest fire management, or EbA works?	Yes	Watershed and forest interventions occur in/near natural forest cover; no critical habitat identified but localized disturbance possible.

Principle No	AF ESP Principle	Official ESP Principle Statement	Screening Checklist Question Applied	Triggered?	Screening Determination / Justification Summary
		conservation value, including as critical habitat; or (d) recognized as protected by traditional or indigenous local communities.			
P10	Conservation of Biological Diversity	Projects/programmes supported by the Fund shall be designed and implemented in a way that avoids any significant or unjustified reduction or loss of biological diversity or the introduction of known invasive species.	Could the project/activity result in loss of biodiversity, habitat fragmentation, or introduction of invasive species (e.g., through water infrastructure construction, forestry interventions, or EbA planting)?	Yes	Small-scale watershed/forest works may cause localized, reversible impacts; no invasive species introduced.
P11	Climate Change	Projects/programmes supported by the Fund shall not result in any significant or unjustified increase in greenhouse gas emissions or other drivers of climate change.	Could the project/activity result in a significant increase in greenhouse gas emissions or other drivers of climate change (e.g., through construction activity, vehicle use, materials, or vegetation loss)?	Yes	Project is an adaptation intervention; GHG footprint from construction machinery/transport is minor and not a driver of climate change at scale.
P12	Pollution Prevention and Resource Efficiency	Projects/programmes supported by the Fund shall be designed and implemented in a way that meets applicable international standards for maximizing energy efficiency and minimizing material resource use, the production of wastes, and the release of pollutants.	Could the project/activity generate pollution (construction waste, wastewater, chemicals, sedimentation) or use resources (energy, water, materials) inefficiently?	Yes	Construction waste, agro-input packaging and greenhouse plastics require management; water/energy use to be optimized.
P13	Public Health	Projects/programmes supported by the Fund shall be designed and implemented in a way that avoids potentially significant negative impacts on public health.	Could the project/activity pose risks to public health and safety (e.g., water quality/contamination, construction site hazards, vector-breeding sites, worker or community exposure)?	Yes	Unsafe drinking water linked to illness; construction may create additional public-health and safety risks.

Principle No	AF ESP Principle	Official ESP Principle Statement	Screening Checklist Question Applied	Triggered?	Screening Determination / Justification Summary
P14	Physical and Cultural Resources/Heritage	Projects/programmes supported by the Fund shall be designed and implemented in a way that avoids the alteration, damage, or removal of any physical cultural resources, cultural sites, and sites with unique natural values recognized as such at the community, national or international level. Projects/programmes should also not permanently interfere with existing access and use of such physical and cultural resources.	Could the project/activity damage, alter, or restrict access to physical cultural resources, sacred sites, or heritage values recognized by the local community?	Yes	Sacred sites (temples, chortens, monasteries, sacred springs/trees) exist near some catchments/pipelines.
P15	Lands and Soil Conservation	Projects/programmes supported by the Fund shall be designed and implemented in a way that promotes soil conservation and avoids degradation or conversion of productive lands or land that provides valuable ecosystem services.	Could the project/activity contribute to soil erosion, degradation of productive agricultural land, or loss of valuable ecosystem services from land (e.g., through irrigation scheme construction, forest fire management, or watershed works)?	Yes	Terracing, channel excavation, dam construction and pipeline trenching create soil erosion/disturbance risk.

Table 2 above establishes which of the Adaptation Fund's 15 ESP principles are triggered. Table 3 below expands on that checklist, recording for each triggered principle the number of individually screened activities and sub-activities through which the principle is engaged, together with a summary justification drawn from the Main Sheet, the household survey and available forestry and land-cover data. This principle-by-principle evidence base underpins the activity-level risk consolidation in Table 4 and the Category B determination in Section 2.4.

Table 3: Summary of the 15 AF ESP Principles — Aggregate Screening Result and Justification

No.	AF ESP Principle	Triggered?	Overall Justification Summary
1	Compliance with the Law	Yes	Project activities (water infrastructure, forestry, agriculture) require domestic permits/clearances.
2	Access and Equity	Yes	Household survey shows unequal access to existing water services for new settlers, remote and poor households.
3	Marginalized and Vulnerable Groups	Yes	Elderly, disabled, isolated and very poor households face specific difficulty using water infrastructure.
4	Human Rights	Yes	Project touches rights to water, land use and freedom from discrimination; consultations already incorporate rights-based framing.

No.	AF ESP Principle	Triggered?	Overall Justification Summary
5	Gender Equality and Women's Empowerment	Yes	Women bear the majority of water-collection and domestic burden and are underrepresented in some decision-making, but are already central users and workers.
6	Core Labour Rights	Yes	Construction and land-development activities create risk of child labour and require OHS compliance.
7	Indigenous Peoples	Yes	Bhutan does not recognize legally distinct Indigenous Peoples under domestic law; however, rich Indigenous and Local Knowledge (ILK) systems exist and must be respected.
8	Involuntary Resettlement	Yes	Small-scale, temporary land use for pipelines, intake structures, tanks, channels and small dams; no physical relocation anticipated.
9	Protection of Natural Habitats	Yes	Watershed and forest interventions occur in/near natural forest cover; no critical habitat identified but localized disturbance possible.
10	Conservation of Biological Diversity	Yes	Small-scale watershed/forest works may cause localized, reversible impacts; no invasive species introduced.
11	Climate Change	Yes	Project is an adaptation intervention; GHG footprint from construction machinery/transport is minor and not a driver of climate change at scale.
12	Pollution Prevention and Resource Efficiency	Yes	Construction waste, agro-input packaging and greenhouse plastics require management; water/energy use to be optimized.
13	Public Health	Yes	Unsafe drinking water linked to illness; construction may create additional public-health and safety risks.
14	Physical and Cultural Resources/Heritage	Yes	Sacred sites (temples, chortens, monasteries, sacred springs/trees) exist near some catchments/pipelines.
15	Lands and Soil Conservation	Yes	Terracing, channel excavation, dam construction and pipeline trenching create soil erosion/disturbance risk.

Table 4: Screening Summary of Environmental and Social Risks by Activity and Sub-Activity

Activity No.	Activity / Sub-Activity	Responsible	Risk	Likelihood	Impact	Risk Significance
1.1 Water Resource Management & Governance strengthened						
1.1.1.a	Revision of Water Policy and Vision 2008	DoW	Limited participation of women, CSOs and vulnerable groups in policy consultation, weakening equity of the revised policy	Low	Low	Low
1.1.2.a	Develop Wangchu River Basin Management Plan	DOW	Wangchhu River Basin Management Plan formed without integrating customary/traditional water allocation rules and downstream user rights (ILK), reducing local legitimacy and uptake	Medium	Medium	Medium
1.1.2.b	Develop Wangchu Water Security Index System.	DoW	Water Security Index (WSI) System designed without reflecting community-level water-security perceptions and vulnerable-household indicators documented in the survey/data collection This needs to be weighted into the index, not just infrastructure metrics	Medium	Medium	Medium
1.1.2.c	Establish the Wangchhu River Basin Committee.	DOW	Wangchhu River Basin Committee established without adequate WUA/community and downstream-user representation, reducing local legitimacy	Low	Low	Low

Activity No.	Activity / Sub-Activity	Responsible	Risk	Likelihood	Impact	Risk Significance
1.1.3.a	Strengthen the programme on the water curriculum at the College of Science and Technology.	DoW	Minimal risk; equipment procured for the water engineering curriculum could be lost/misused without an asset register	Low	Low	Low
1.1.3.b	Assess the ongoing water adaptation activities and publish a paper on the future intervention measures.	DoW	Assessment of ongoing adaptation activities does not capture perspectives of vulnerable/marginalized households, weakening relevance of published recommendations in this cintext	Low	Low	Low
1.1.4.a	Carry out hydrogeological mapping and identify potential recharge areas of the water supply schemes.	DoW	Field survey teams entering farmland/private land without landowner consent; incidental crop/property damage	Medium	Low	Medium
1.1.4.b	Design and implement appropriate EbA measures to sustain the sources.	DoW	Minor Vegetation clearing and ground disturbance during watershed/spring-shed works causing micro site specific soil erosion and sedimentation of water sources	Medium	Medium	Medium
			Disturbance to and by grazing/fuelwood/NTFP collection access in protected recharge zones	Low	Low	Low
			Occupational health and safety hazards for labourers working on steep watershed terrain (falls, tool injuries) during NbS implementation	Medium	Medium	Medium
1.1.4.c	Installation of microclimate and meteorological stations.	DoW	Land use for meteorological/microclimate station siting without landowner/community consent; livestock damage to unfenced equipment	Low	Low	Low
1.1.4.d	Built in-house capacity by providing training and capacity development to carry out modelling works.	DoW	Gender-imbalanced technical training (hydrological modelling roles historically male-dominated)	Medium	Low	Medium
1.2: EbA solutions & SLM to enhance watershed functions; minimise the impact of floods & extreme rainfall.						
1.2.1.a	Support sustainable land development through efficient utilisation of agricultural land (terrace development and consolidation)	DoA	Land disturbance/soil erosion during terracing; Boundary disputes between neighbouring farmers during terrace development;	Medium	Medium	Medium
1.2.1.b	Support sustainable land development through efficient utilisation of agricultural land (bio-engineering, check - dam & orchard basin management)	DoA		Low	Low	Low

Activity No.	Activity / Sub-Activity	Responsible	Risk	Likelihood	Impact	Risk Significance
1.2.1.c	Conduct a feasibility study for storing excess water.	DoW	Feasibility study for storing excess water does not adequately reflect community priorities, gender roles and traditional practices documented in the household survey	Low	Low	Low
1.2.1.d	Develop and design an implementation plan	DoW	Implementation plan does not adequately reflect community priorities, gender roles and traditional practices documented in the household survey	Low	Low	Low
1.2.1.e	Develop a guiding framework for climate-resilient water and water-related services.	DoW	Climate-resilient water/water-related services framework does not adequately reflect community priorities, gender roles and traditional practices documented in the household survey	Low	Low	Low
1.2.2.a	Develop a guideline for an overall framework for Drought Preparedness and Response Pla (DPRP) and develop DPRP for Thimphu Dzongkhag	DoW	DPRP does not adequately provide for the most drought-vulnerable households (elderly, disabled, isolated, poor) and the most critical water shortage season identified in the survey	Medium	Medium	Medium
1.2.3.a	Promote protected agriculture to enhance year-round production, improve productivity, and strengthen climate resilience.	DoA	Improper use/disposal of agro-inputs (protected-agriculture greenhouse plastic film) and inappropriate technology adoption without adequate training	Medium	Low	Low
1.2.3.b	Promote the adoption of smart irrigation and water harvesting technologies to improve water-use efficiency and climate resilience.	DoA	Inappropriate adoption of smart irrigation/water-harvesting technology without adequate training, risking wasted investment	Medium	Low	Low
1.2.3.c	Promote the adoption of organic agriculture, Good Agricultural Practices (GAP), and integrated soil fertility and integrated pest management (IPM) practices.	DoA	Improper use/disposal of agro-inputs under organic/GAP/IPM promotion without adequate training	Medium	Low	Low
1.3 Mitigation of forest fire hazards by promoting integrated forest fire management.						
1.3.1.a	Stakeholder Consultation & Formation of GFFCG	DoFPS/DLGDM	Gender-imbalanced GFFCG membership excludes women from firefighting decision-making and resource allocation	Medium	Low	Low
1.3.1.b	Development of ToR, Guidelines & Planning Documents: Drafting, review, and validation workshops, Coordination meetings for	DoFPS/DLGDM	ToR/guidelines for GFFCG operation do not mandate gender-inclusion or OHS/safety standards for firefighting response	Low	Low	Low

Activity No.	Activity / Sub-Activity	Responsible	Risk	Likelihood	Impact	Risk Significance
	endorsement and finalization					
1.3.1.c	Capacity Building & Training: training workshops for GFCG members on forest fire prevention and response	DoFPS/DLGDM	Physical hazard to GFFCG volunteers during firefighting-response training and drills (burns, smoke inhalation, injury) in Gewogs where 86-96% of forest cover is fire-sensitive vegetation	Medium	Medium	Medium
1.3.1.d	Procurement and distribution of Firefighting Tools & Basic Equipment.	DoFPS/DLGDM	Physical hazard to GFFCG volunteers during actual firefighting deployment if issued equipment lacks fire-resistant PPE	Medium	Medium	Medium
1.3.2.a	Development of Nature based adaptation solution for the forest fire suppression (Construction of the earthen dam) 1. Gewog: Kawang ((New Creation) Zilukha – 1 Wangdue Tse – 1	DoFPS/ DLGDM	Land use for earthen-dam siting without landowner/community consent;	Low	Medium	Medium
			Drowning/safety hazard from impounded water for children and livestock;	Low	Medium	Medium
1.3.2.b	Development of Nature based adaptation solution for the forest fire suppression (Construction of the earthen dam): 4. Gewog: Geney Wangbama – 1 (New Creation)	DoFPS/ DLGDM	Land use for earthen-dam siting without landowner/community consent; minor impact on downstream flow or other water users	Medium	Medium	Medium
			Drowning/safety hazard from impounded water for children and livestock; potential localized habitat/drainage alteration	Low	Medium	Medium
2.1 Enhanced access to clean and safe drinking water						
2.1.1	2.1.1: Construction of Woluna Water Supply Scheme	DOID/ Dzongkhag	The water soruce for Woluna schem fall within Kabisa (another gewog). Risk of change in LS's water allocation in furture. Reduction of downstream environmental flow at the source;	Low	Medium	Medium
			Land/way-leave required for Woluna pipeline route, intake and tank sites are located within State Reserved Forest land (Department of Forest). Risk of state forest plans and interventions	Low	Medium	Medium
			Construction-related occupational health & safety hazards at Woluna (trenching, pipe-laying on steep terrain)	Medium	Medium	Medium

Activity No.	Activity / Sub-Activity	Responsible	Risk	Likelihood	Impact	Risk Significance
			Influx of construction workers at Woluna raises risk of gender-based violence / sexual exploitation, abuse and harassment (SEAH); child labour on construction/repair tasks	Low-Medium	Medium	Medium
			Unsafe water quality at Woluna commissioning if disinfection/testing is skipped	Medium	Medium	Medium
			New settlers, remote and very poor households excluded from new connections at Woluna, replicating the exclusion pattern found in the existing system (25% of respondents of the household survey)	Low	Medium	Medium
2.1.2	2.1.2: Construction of Changtagang Water Supply Scheme	DOID/ Dzongkhag	Land/way-leave required for Changtagang pipeline route, intake and tank sites are located within State Reserved Forest land (Department of Forest). Risk of state forest plans and interventions Water Complications on water allocation Reduction of downstream environmental flow at the source;	Medium	Medium	Medium
			Land/way-leave required for Changtagang pipeline route, intake and tank sites are located within State Reserved Forest land (Department of Forest). Risk of state forest plans and interventions	Low	Medium	Medium
			Construction-related occupational health & safety hazards (trenching, pipe-laying on steep terrain)	Medium	Medium	Medium
			Influx of construction workers at Changtagang raises risk of gender-based violence / sexual exploitation, abuse and harassment (SEAH); child labour on construction/repair tasks	Low-Medium	Medium	Medium
			Unsafe water quality at Changtagang commissioning if disinfection/testing is skipped	Medium	Medium	Medium
			New settlers, remote and very poor households excluded from new connections at Changtagang, replicating the exclusion pattern found in the existing system (25% of respondents of the household survey)	Low	Medium	Medium

Activity No.	Activity / Sub-Activity	Responsible	Risk	Likelihood	Impact	Risk Significance
2.1.3	2.1.3: Construction of Chamgang Water Supply Scheme	DOID/ Dzongkhag	Land/way-leave required for Chamgang pipeline route, intake and tank sites are located within State Reserved Forest land (Department of Forest). Risk of state forest plans and interventions Water Complications on water allocation Reduction of downstream environmental flow at the source;	Medium	Medium	Medium
			Construction-related occupational health & safety hazards (trenching, pipe-laying on steep terrain)	Medium	Medium	Medium
			Influx of construction workers at Chamgang raises risk of gender-based violence / sexual exploitation, abuse and harassment (SEAH); child labour on construction/repair tasks	Low-Medium	Medium	Medium
			Unsafe water quality at Chamgang commissioning if disinfection/testing is skipped	Medium	Medium	Medium
			New settlers, remote and very poor households excluded from new connections at Chamgang, replicating the exclusion pattern found in the existing system (25% of respondents of the household survey)	Low	Medium	Medium
			The proposal for facilitating all distribution lines from one main distribution tank could overload the distribution point (pointed at the FGD in Chamgang)	Low	Low	Low
2.1.4	2.1.4: Construction of Khasadrapchu Water Supply Scheme	DOID/ Dzongkhag	Land/way-leave required for Khasadrapchhu pipeline route, intake and tank sites are located within State Reserved Forest land (Department of Forest). Risk of state forest plans and interventions Water Complications on water allocation Reduction of downstream environmental flow at the source;	Medium	Medium	Medium
			Construction-related occupational health & safety hazards (trenching, pipe-laying on steep terrain)	Medium	Medium	Medium
			Influx of construction workers at Khasadrapchu raises risk of gender-based violence / sexual exploitation, abuse and harassment (SEAH); child labour on construction/repair tasks	Low-Medium	Medium	Medium

Activity No.	Activity / Sub-Activity	Responsible	Risk	Likelihood	Impact	Risk Significance
			Unsafe water quality at Khasadrapchu commissioning if disinfection/testing is skipped	Medium	Medium	Medium
			New settlers, remote and very poor households excluded from new connections at Khasadrapchu, replicating the exclusion pattern found in the existing system (25% of respondents of the household survey)	Low	Medium	Medium
			Risk of damage to existing Khasadrapchhu hydropower water line along the Jemina stretch	Low	Low	Low
			At the two sides of the over-hang river crossing of pipeline over Wangchhu, children may climb for fun and cause risk to their lives	Low	Medium	Medium
			Highway road crossing at Khasadrapchhu and Jemina road crossing of water pipeline may cause damage to road	Low	Medium	Medium
2.1.5	2.1.5: Construction of Rama Water Supply Scheme	DOID/ Dzongkhag	Land/way-leave required for Rama pipeline route, intake and tank sites are located within State Reserved Forest land (Department of Forest). Risk of state forest plans and interventions Water Complications on water allocation Reduction of downstream environmental flow at the source;	Medium	Medium	Medium
			Construction-related occupational health & safety hazards (trenching, pipe-laying on steep terrain)	Medium	Medium	Medium
			Influx of construction workers at Rama raises risk of gender-based violence / sexual exploitation, abuse and harassment (SEAH); child labour on construction/repair tasks	Low-Medium	Medium	Medium
			Unsafe water quality at Rama commissioning if disinfection/testing is skipped	Medium	Medium	Medium
			New settlers, remote and very poor households excluded from new connections at Rama, replicating the exclusion pattern found in the existing system (25% of respondents of the household survey)	Low	Medium	Medium
2.2: Enhanced access to adequate irrigation water						

Activity No.	Activity / Sub-Activity	Responsible	Risk	Likelihood	Impact	Risk Significance
2.2.1	2.2.1: Rehabilitation of Lower Woluna/Danglo Irrigation Channel	DOID/ Dzongkhag	Inequitable water distribution at Lower Woluna/Danglo favouring head-end farmers over tail-end farmers, landless sharecroppers and new settlers (confirmed by 23% of respondents)	Low	Medium	Medium
			Construction-related occupational health & safety hazards (trenching, pipe-laying on steep terrain)	Medium	Medium	Medium
			Tempofary irrigation water shortages during rehabilitation works along the existing channel	Medium	Medium	Medium
2.2.2	2.2.2: Rehabilitation of Irrigation Channel from Dalukha to Khasakha	DOID/ Dzongkhag	Inequitable water distribution at Dalukha-Khasakha favouring head-end farmers over tail-end farmers, landless sharecroppers and new settlers (confirmed by 23% of respondents)	Low	Medium	Medium
			Construction-related occupational health & safety hazards (trenching, pipe-laying on steep terrain)	Medium	Medium	Medium
			Tempofary irrigation water shortages during rehabilitation works along the existing channel	Medium	Medium	Medium
2.2.3	2.2.3: Rehabilitation of Irrigation Channel from Dalukha to Dalulum	DOID/ Dzongkhag	Inequitable water distribution at Dalukha-Dalulum favouring head-end farmers over tail-end farmers, landless sharecroppers and new settlers (confirmed by 23% of respondents)	Low	Medium	
			Construction-related occupational health & safety hazards (trenching, pipe-laying on steep terrain)	Medium	Medium	Medium
			Tempofary irrigation water shortages during rehabilitation works along the existing channel	Medium	Medium	Medium
2.2.4	2.2.4: Construction of Irrigation Scheme from Gangritueshay to Zangleykha	DOID/ Dzongkhag	Inequitable water distribution at Gangritueshay-Zangleykha favouring head-end farmers over tail-end farmers, landless sharecroppers and new settlers (confirmed by 23% of respondents)	Medium	Medium	Medium
			Construction-related occupational health & safety hazards (trenching, pipe-laying on steep terrain)	Medium	Medium	Medium
			Influx of construction workers raises risk of gender-based violence / sexual exploitation, abuse and harassment (SEAH); child labour on construction/repair tasks	Low-Medium	Medium	Medium
			The tail end storate outlet above the Chezhi Goenpa may creat minor downstream soil erosions	Low	Low	Low
3.1 Community based WUAs strengthened for effective management of irrigation & drinking water.						

Activity No.	Activity / Sub-Activity	Responsible	Risk	Likelihood	Impact	Risk Significance
3.1.1.a	3.1.1a: Community engagement and WUA establishment or strengthening.	DoW	Elite capture of WUA office-bearer positions could skew future water allocation and O&M decisions in favour of a few households. Consultation meetings and WUA committee formation may be dominated by better-connected households or existing male leadership, sidelining women, isolated settlements, and elderly/female-headed households from decision-making over shared water resources	Medium	Medium	Medium
3.1.1.b	3.1.1b: Conduct training workshops on project management, financial management and monitoring and evaluation skills for community-based water user groups.	DoW	Training content for WUA office bearers does not build the specific financial/administrative capacity of women and vulnerable office bearers, undermining sustained inclusion	Low	Low	Low
3.2 Capacity of local communities, local leaders & organizations enhanced on local adaptation planning & implementation						
3.2.1.a	Capacity building of Local Government functionaries on mainstreaming GECDP into local plans and programs.	DLGDM	Capacity-building training for LG functionaries may under-represent women, as Gewog leadership positions (Gup, Mangmi) are predominantly held by men in Bhutan	Medium	Low	Medium
3.2.1.b	Procurement of local consultant for development of curriculum	DLGDM	Curriculum developed by the local consultant does not adequately reflect gender-responsive and inclusion content	Low	Low	Low
3.2.1.c	Establishment of Community Engagement Platform in 5 targeted Gewogs.	DLGDM	Community Engagement Platforms in the 5 target Gewogs may under-represent women given predominantly male local leadership	Medium	Low	Medium
3.2.2.a	Provide capacity-building training on project management, financial management, and communication and advocacy skills for Gups, GAOs, Mangmis, concerned Tshogpas, DPO, EDMO, and Accountants.	DLGDM	Same gender-representation risk as Activity 3.2.1 for Gups/GAOs/Mangmis/Tshogpas/DPO/EDMO/Accountant training	Medium	Low	Medium
3.2.3.a	Training on sustainable Management of Water Supply (Rural & Peri-Urban)- for	Dzongkhag/ Gewogs MOIT	Gender imbalance in the water-supply technical workforce limits women's access to technical capacity-building	Medium	Low	Medium

Activity No.	Activity / Sub-Activity	Responsible	Risk	Likelihood	Impact	Risk Significance
	technicians and engineers.					
3.2.3.b	Capacity building of engineers on design of water supply & Irrigation systems	Dzongkhag/ Gewogs MOIT	Gender imbalance in the engineering workforce limits women's access to design-focused technical capacity-building	Medium	Low	Medium
3.2.4.a	Conduct capacity-building programs for farmers on sustainable agricultural practices, climate-smart technologies, and resource-efficient farming.	DoA	Training timing may conflict with women's domestic/care workload (cooking, cleaning, water/fuelwood collection, childcare), reducing women farmers' attendance despite women being primary agricultural decision-makers per the survey	Medium	Low	Medium
3.2.4.b	Provide training to extension agents on sustainable agricultural practices, including soil health management, water conservation, and integrated pest management.	DoA	Training for extension agents does not equip them to deliver gender-responsive extension advice to women farmers	Low	Low	Low
3.2.5.a	Provide training on disaster risk management to the LG functionaries and WUA	DLGDM	Training/awareness materials on disaster risk management may not reach the most disaster-vulnerable households (elderly, disabled, isolated) identified in the household survey	Medium	Medium	Medium
3.3 Project Results and Lessons Learned disseminated effectively.						
3.3.1.a	Facilitate Participatory Learning, Knowledge Exchange, and Exposure Visits(both within & Ex country) among project stakeholders, including community members, local leaders, and implementing partners	PMU	Selection of participants for exposure visits/learning events dominated by elites or officials, excluding grassroots/women representatives	Low	Low	Low
3.3.2.a	Develop project brochures,briefs and dissemination	PMU	Dissemination materials inaccessible to low-literacy population (25% of respondents report no formal education) or non-Dzongkha speakers	Medium	Low	Low
3.3.3.a	Carry out project level Monitoring	PMU		Low	Low	Low
Cross-Cutting / Project-Wide Measures						

Activity No.	Activity / Sub-Activity	Responsible	Risk	Likelihood	Impact	Risk Significance
Project-wide	Establishment and operation of the Project Grievance Redress Mechanism (GRM)	PMU / Gewog Focal Persons / WUAs	Absence of an accessible, confidential and gender-responsive GRM leaves affected people (including SEAH survivors) without a safe channel to raise concerns, despite 72% of respondents already knowing where to report general concerns	Low	Medium	Medium
Project-wide	Partnership for GBV/SEAH referral pathway with RENEW, NCWC and Gewog health centres	PMU Gender/ESS Focal Point	Survivors of GBV/SEAH linked to project workers/sites lack a functioning referral pathway to health, legal and psychosocial support	Low-Medium	Medium	Medium
Project-wide	ESMP monitoring, photo-documentation and quarterly ESS/GAP reporting	PMU M&E / ESS Focal Point	ESMP mitigation measures not implemented or verified consistently across all Outputs, undermining AF reporting requirements (annual performance reports, mid-term/terminal evaluation)	Low	Medium	Medium
Project-wide	Project ESS Expert recruitment	BTFEC/IE	lack of ESMP updates, compilance monitoring and reporting may affect quality of project deliverables	Medium	Medium	Medium

2.4 Project Environmental and Social Risk Categorization

The principle-level justifications set out in Table 3 and the activity-level risk consolidation in Table 4 together form the evidentiary basis for the project categorization below.

In accordance with the Adaptation Fund Environmental and Social Policy (ESP, approved November 2013, revised March 2016), projects are categorized according to the scale, nature and severity of their potential environmental and social risks and impacts. Category A applies to projects with significant adverse risks that are diverse, large-scale, widespread or irreversible. Category C applies to projects with minimal or no adverse risks. This project falls under Category B: its potential adverse environmental and social risks and impacts are limited, site-specific, few in number, small in scale and predominantly reversible or readily addressed through the mitigation measures set out in this ESMP.

Specifically:

(i) Civil works are small to medium scale (five drinking-water schemes - Woluna, Changtagang, Chamgang, Khasadrapchu and Rama; four irrigation schemes - Lower Woluna/Danglo, Dalukha-Khasakha, Dalukha-Dalulum and Gangritueshay-Zangleykha; small-scale watershed structures; and earthen dams for forest-fire suppression) and confined to five Gewogs of Thimphu Dzongkhag;

(ii) No permanent physical displacement or resettlement is anticipated;

(iii) (No legally protected areas, critical habitats or internationally recognized cultural heritage sites are affected, although localized sacred sites near the Woluna and Changtagang alignments and forest cover require site-specific avoidance measures;

(iv) Impacts on soil, water quality, biodiversity and public health are localized, temporary and manageable through standard engineering and operational mitigation; and

(v) Social risks (unequal access, gender gaps, elite capture, underrepresentation of vulnerable groups) identified through the household survey and stakeholder/ESS/GAP consultations are well understood and addressed through targeted, costed mitigation measures in the ESMP. All fifteen ESP principles are triggered at a low-to-moderate level across one or more of the project's 48 individually screened activities/sub-activities, requiring management measures; none are triggered at a level requiring Category A treatment.

This ESMP (Part 2) sets out the management measures, costs, responsible parties and indicators required to manage the identified risks to an acceptable level throughout project implementation.

3. Part 2: Environmental and Sical Management Plan (ESMP)

3.1 Objective and Scope

This ESMP sets out the environmental and social risks associated with each activity and sub-activity of the project, together with the corresponding management/mitigation measures, their estimated cost, the party responsible for implementation, and the indicator by which implementation will be verified. The ESMP covers all three project components and is designed to be updated during detailed engineering design and implementation as site-specific information becomes available.

3.2 Institutional Arrangements for ESMP Implementation

- Project Management Unit (PMU): overall ESMP coordination, budget management, and consolidated ESS/GAP reporting to the Adaptation Fund through BTFEC.
- ESS and Gender Focal Point (PMU): day-to-day oversight of ESMP/GAP implementation, GRM coordination, and liaison with RENEW/NCWC on GBV/SEAH referrals.
- Executing Entities - Department of Water (DoW), Department of Occupational and Infrastructure Development (DOID), Department of Forests and Park Services (DoFPS), Department of Agriculture (DoA), Department of Local Governance and Disaster Management (DLGDM): implementation of activity-specific mitigation measures within their respective outputs.
- Dzongkhag and Gewog Administrations: local-level coordination, land-use consent facilitation, and Gewog-level GRM focal persons.
- Water User Associations (WUAs) and Gewog Forest Fire Coordinating Groups (GFFCGs): community-level implementation, monitoring and grievance referral.
- Contractors: compliance with contractual ESMP/OHS/Code of Conduct obligations during civil works, verified by the responsible Executing Entity.

3.3 Key Household Survey Findings Informing ESS Risk Identification

A household survey of 231 respondents across the five target Gewogs (Kawang, Geney, Mewang, Dagala and Chang) provided critical evidence used to strengthen the ESS risk identification and mitigation measures in this ESMP. Key findings include:

- Water access inequity: 56 of 231 respondents (24%) report that some households are excluded from the existing piped water system, principally new settlers (58 mentions), the very poor (24) and remote households (19); 53 of 231 (23%) confirm irrigation-water disparities affecting tail-end farmers, landless sharecroppers and new settlers.
- Vulnerable groups: 52 of 231 respondents (22%) report a household member who finds it difficult to use existing water infrastructure, mainly due to old age (49 mentions), disability (14) or household isolation (17).
- Water scarcity: 74 respondents report "often" and 107 "sometimes" experiencing dry-season water shortages, underscoring the urgency of the proposed infrastructure and drought-preparedness measures.
- Cultural heritage: 46 of 231 respondents (20%) identify sacred/religious sites near water infrastructure or catchments, and 36 (16%) believe project works could affect them.
- Land use and compensation: 52 of 231 respondents (22%) report existing or anticipated structures on or near their land; of these, the large majority expect fair compensation (91) or a community agreement (41), while only 7 expect no compensation.
- Public health: 32 of 231 respondents (14%) report a household member falling ill in the past 12 months due to suspected unsafe water.
- Awareness and participation: only 76 of 231 respondents (33%) fully understand project roles and responsibilities, while 59 report no understanding at all - indicating a need for strengthened disclosure and consultation.

- Grievance mechanism awareness: 167 of 231 respondents (72%) know where to report general project-related complaints, and 172 (74%) know where to report SEAH-related concerns, providing a foundation on which to build a formal GRM.
- Child labour: 28 of 231 respondents (12%) believe children under 18 may be involved in carrying materials or heavy work related to water/irrigation infrastructure construction or repair.
- Gender-based violence and harassment: 16 of 231 respondents have heard of a harassment case in their community, and 20 believe women, girls or persons with disabilities face particular risk; 129 of 231 (56%) say they would feel safe reporting an incident of solicitation for sexual favours in exchange for services.
- Gender roles: women represent 59% of survey respondents and report disproportionate responsibility for water and fuelwood collection, cooking, cleaning and childcare, reinforcing the case for gender-responsive design and targeted participation safeguards throughout the ESMP.

These findings are referenced throughout the risk matrix in Section 3.5 and directly inform the design of mitigation measures related to equity of access, protection of vulnerable groups, gender, child labour, GBV/SEAH, cultural heritage and grievance redress.

3.4 Risk Rating Methodology

Each identified risk is rated using a standard qualitative Likelihood x Impact matrix (Low / Medium / High for both dimensions). Likelihood reflects the probability of the risk materializing given project design and context; Impact reflects the severity of the consequence for affected people or the environment if the risk materializes. The combination determines the priority attached to the corresponding mitigation measure; risks rated High on either dimension receive priority mitigation and monitoring attention.

3.5 Environmental and Social Risk and Mitigation Matrix

The following tables present the identified environmental and social risks, their likelihood and impact, the management/mitigation measures, estimated costs, responsible parties and monitoring indicators for every activity and sub-activity, organized by Component and Output. Cell shading in the Likelihood/Impact columns indicates overall risk priority (green = lower priority, amber = medium priority, red = higher priority requiring closer monitoring).

Table 5 below consolidates, in a single master matrix, the risk, mitigation measure, residual risk, estimated cost, responsible party and monitoring indicator for every activity and sub-activity identified in Table 4, together with the four cross-cutting, project-wide measures that apply across all Components. It provides a single point of reference for the ESMP as a whole; Tables 6–13 that follow present the same information disaggregated by Output for ease of implementation and monitoring by the responsible parties named below, and Table 14 restates the cross-cutting measures as a stand-alone reference. The cost figures reconcile with the Budget Breakdown in the Section 1.1 summary box and the Cost Summary in Section 3.6.

Table 5: Consolidated Environmental and Social Management Plan (ESMP) Matrix

Note: L = Likelihood; I = Impact; Sig. = overall Risk Significance (each rated Low / Medium / High per the risk rating methodology in Section 3.4).

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
Output 1.1 Water Resource Management & Governance strengthened									
1.1.1.a	Revision of Water Policy and Vision 2008	DoW	Limited participation of women, CSOs and vulnerable groups in policy consultation, weakening equity of the revised policy	Low	Mandate and record ≥30% women participants in each of the planned workshops and Maintain sex-disaggregated attendance sheets; invite CSO/vulnerable-group representatives; Residual risk: minor risk of continued gender/CSO under-representation in later/follow up consultation rounds and mitigated through routine attendance tracking against the ≥30% target at each subsequent workshop.	Low	0	Budgeted within the activity	% women participants per workshop (target ≥30%); attendance registers disaggregated by sex
1.1.2.a	Develop Wangchu River Basin Management Plan	DOW	Wangchhu River Basin Management Plan formed without integrating customary/traditional water allocation rules and downstream user rights (ILK), reducing local legitimacy and uptake	Medium	Document ILK on traditional water allocation at the basin level and integrate into the Basin Plan. Ensure Basin Committee includes reporsentation of the WUA/community representatives; Residual risk: limited scope for capturing all customary practices in one ILK workshop; addressed through periodic Basin Committee review of the ILK chapter during implementation.	Low	3,000		Basin Plan document contains an ILK/customary-practice chapter

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
1.1.2.b	Develop Wangchu Water Security Index System.	DoW	Water Security Index (WSI) System designed without reflecting community-level water-security perceptions and vulnerable-household indicators documented in the survey/data collection . Thi needs to be weighted into the index, not just infrastructure metrics	Medium	Integrate household wate needs and conditions (age, disability, poverty, new-settler status) into WSI design through a dedicated integration workshop; Residual risk: some vulnerability indicators may still be under-captured; addressed through a mid-term review of the WSI methodology with community feedback.	Low		Datas collecition/survey costed in the activity	WSI methodology document includes a vulnerability/ hoseholds needs
1.1.2.c	Establish the Wangchhu River Basin Committee.	DOW	Wangchhu River Basin Committee established without adequate WUA/community and downstream-user representation, reducing local legitimacy	Low	Mandate WUA/community representatives (incl. ≥1 woman) on the Basin Committee; Document selection criteria of WRBC committee members Residual risk: representation gaps may persist if members are replaced; addressed through an annual review of Basin Committee composition against the representation criteria.	Low	0	Meetings/workshops costed iunder the activity	Basin Committee membership register shows community representatives
1.1.3.a	Strengthen the programme on the water curriculum at the College of Science and Technology.	DoW	Minimal risk; equipment procured for the water engineering curriculum could be lost/misused without an asset register	Low	None	Low	0		

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
1.1.3.b	Assess the ongoing water adaptation activities and publish a paper on the future intervention measures.	DoW	Assessment of ongoing adaptation activities does not capture perspectives of vulnerable/marginalized households, weakening relevance of published recommendations in this cintext	Low	Assessment methodology to include a targeted sample of vulnerable/new-settler households and disaggregate findings by sex and social group; Residual risk: findings may still under-represent hard-to-reach households; addressed through a follow-up validation session with vulnerable-household representatives before publication.	Low	0	Assessment costed iunder the activity	Published assessment includes disaggregated findings for vulnerable groups
1.1.4.a	Carry out hydrogeological mapping and identify potential recharge areas of the water supply schemes.	DoW	Field survey teams entering farmland/private land without landowner consent; incidental crop/property damage	Medium	Obtain prior informed consent (verbal/written) from landowners before site entry; Residual risk: isolated disputes may still arise; addressed through the project GRM procedure.	Low	0	No cost exepected	Signed consent record for 100% of surveyed parcels/sites survey farmland/private land are involved; zero unresolved complaints
1.1.4.b	Design and implement appropriate EbA measures to sustain the sources.	DoW	Minor Vegetation clearing and ground disturbance during watershed/spring-shed works causing micro site specific soil erosion and sedimentation of water sources	Medium	BbA measures to include site-specific erosion-control plan (silt fences, staged works, contour bunding); Avoid works during peak monsoon; Prioritize bio-engineering over hard structures; Residual risk: some erosion may persist despite controls, particularly in the first monsoon after works; addressed through post-monsoon inspection and	Low	0	BbA measures ciosted under activity	Erosion-control measures verified and in place at 100% of sites prior to and during works; Post-monsoon site inspection reports

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
					remedial bio-engineering works where erosion-control structures underperform.				
			Disturbance to and by grazing/fuelwood/NTFP collection access in protected recharge zones	Low	Shared understanding and greement through community consultation prior to restricting any customary access; Identify alternative fuelwood/NTFP routes; Residual risk: some households may still experience reduced access pending identification of alternatives; addressed through continued DoFPS (local forester) engagement to finalize alternative fuelwood/NTFP sources and GRM monitoring of access-related grievances.	Low	0	Workshops/Public Consultations costed under activity	Agreed munites of consultaitons for each site; Grievance log entries related to access restriction = 0 unresolved
			Occupational health and safety hazards for laborers working on steep watershed terrain (falls, tool injuries) during NbS iimplementation	Medium	PPE provision and toolbox safety talks for all laborers/contractors and first-aid kit on each site; Residual risk: standard fieldwork OHS hazards remain; addressed through continuous site safety supervision, monthly OHS spot-checks and zero-incident reporting via the M&E system.	Low	1,000		Zero reportable OHS incidents; PPE distribution records

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
1.1.4.c	Installation of microclimate and meteorological stations.	DoW	Land use for meteorological/microclimate station siting without landowner/community consent; livestock damage to unfenced equipment	Low	Site on government/community land with documented consent; Fencing around microclimate and meteorological stations Residual risk: low residual risk of localized land-use disputes; addressed through periodic site visits to confirm consent documentation remains valid.	Low	0	Fencing around microclimate and meteorological stations already budgeted under this activity	Land-use consent/agreement on file for each of the 5 station sites
1.1.4.d	Built in-house capacity by providing training and capacity development to carry out modelling works.	DoW	Gender-imbalanced technical training (hydrological modelling roles historically male-dominated)	Medium	Set and monitor a target for women officials nominated to training; prioritize qualified women candidates; Residual risk: structural gender imbalance in the technical workforce may persist beyond this project; addressed through continued tracking of the women-participation target in all future training cohorts.	Low	0	Training cost included under the activity	% women among officials trained (target ≥30%)
Output 1.2: EbA solutions & SLM to enhance watershed functions; minimise the impact of floods and extreme rainfall implemented.									
1.2.1.a	Support sustainable land development through efficient utilisation of agricultural land (terrace development and consolidation)	DoA	Land disturbance/soil erosion during terracing; Boundary disputes between neighbouring farmers during terrace devleopment;	Medium	Verify land boundaries and obtain written farmer consent before works; Apply contour bunding/grass strips post-terracing; schedule works in dry season; Residual risk: boundary disputes may still emerge after works begin; addressed through the project GRM and a standing land-verification protocol with Gewog land records.	Low		Sustainable land development cost included under the activtity	Signed consent for 100% of parcels; Zero unresolved boundary disputes;

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
1.2.1.b	Support sustainable land development through efficient utilisation of agricultural land (bio-engineering, check -dam & orchard basin management)	DoA		Low		Low	0		
1.2.1.c	Conduct a feasibility study for storing excess water.	DoW	Feasibility study for storing excess water does not adequately reflect community priorities, gender roles and traditional practices documented in the household survey	Low	ToR for the feasibility study (survey) to explicitly require review of household survey/ILK findings and gender-disaggregated consultation; Residual risk: consultancy outputs may still under-represent some community perspectives; addressed through a validation workshop with community/WUA representatives prior to final approval.	Low	0	Suvey cost ncluded under the activty	Final study document includes a dedicated section addressing survey/ILK/gender findings
1.2.1.d	Develop and design an implementation plan	DoW	Implementation plan does not adequately reflect community priorities, gender roles and traditional practices documented in the household survey	Low	ToR for the implementation-plan consultancy to explicitly require review of household survey/ILK findings and gender-disaggregated consultation; R Residual risk: consultancy outputs may still under-represent some community perspectives; addressed through a validation workshop with community/WUA representatives prior to final approval.	Low	0	Final plan document and consultancy cost includes	Final plan has a dedicated section addressing survey/ILK/gender findings

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
1.2.1.e	Develop a guiding framework for climate-resilient water and water-related services.	DoW	Climate-resilient water/water-related services framework does not adequately reflect community priorities, gender roles and traditional practices documented in the household survey	Low	ToR for the framework consultancy to explicitly require review of household survey/ILK findings and gender-disaggregated consultation; Residual risk: consultancy outputs may still under-represent some community perspectives; addressed through a validation workshop with community/WUA representatives prior to final approval.	Low	0	Consultancy cost included under activity	Final framework document includes a dedicated section addressing survey/ILK/gender findings
1.2.2.a	Develop a guideline for an overall framework for Drought Preparedness and Response Pla (DPRP) and develop DPRP for Thimphu Dzongkhag	DoW	DPRP does not adequately provide for the most drought-vulnerable households (elderly, disabled, isolated, poor) and the most critical water shortage season identified in the survey	Medium	DPRP to include explicit provisions/priority access for vulnerable households/prirotiy seasons identified survey findings; Residual risk: some vulnerable households may remain under-covered by the approved DPRP; addressed through an annual DPRP review incorporating updated Gewog welfare lists.	Low		Consultancy cost included under activity	Approved DPRP contains a dedicated vulnerable-household provision and critical watyer stress seasons
1.2.3.a	Promote protected agriculture to enhance year-round production, improve productivity, and strengthen climate resilience.	DoA	Improper use/disposal of agro-inputs (protected-agriculture greenhouse plastic film) and inappropriate technology adoption without adequate training	Low	Mandatory training on greenhouse-film waste management and protected-agriculture practices prior to input distribution; Targeted inclusion of women farmers (majority agricultural decision-makers per survey); Residual risk: some improper input use may still occur post-training; addressed through follow-up extension visits and	Low	2,500	Cost included under activity	% of recipients trained before receiving inputs (target 100%; 30% women); waste-management guidance disseminated to all recipients

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
					refresher sessions during the first cropping season.				
1.2.3.b	Promote the adoption of smart irrigation and water harvesting technologies to improve water-use efficiency and climate resilience.	DoA	Inappropriate adoption of smart irrigation/water-harvesting technology without adequate training, risking wasted investment	Low	Mandatory training on smart irrigation/water-harvesting operation and maintenance prior to input distribution; Targeted inclusion of women farmers; Residual risk: some improper input use may still occur post-training; addressed through follow-up extension visits and refresher sessions during the first cropping season.	Low	2,500	Cost included under activity	% of recipients trained before receiving inputs (target 100%; 0% women)
1.2.3.c	Promote the adoption of organic agriculture, Good Agricultural Practices (GAP), and integrated soil fertility and integrated pest management (IPM) practices.	DoA	Improper use/disposal of agro-inputs under organic/GAP/IPM promotion without adequate training	Low	Mandatory training on IPM/organic practices and input waste management prior to input distribution; targeted inclusion of women farmers; Residual risk: some improper input use may still occur post-training; addressed through follow-up extension visits and refresher sessions during the first cropping season.	Low	2,500	Cost included under activity	% of recipients trained before receiving inputs (target 100%; 0% women)
Output 1.3 Mitigation of forest fire hazards by promoting integrated forest fire management.									
1.3.1.a	Stakeholder Consultation & Formation of GFFCG	DoFPS/DLGDM	Gender-imbalanced GFFCG membership excludes women from firefighting decision-making and resource allocation	Low	Set and monitor a target of ≥30% women in each GFFCG, including non-frontline coordination/communication roles, from the point of formation;	Low	0	Cost included under activity	% women in each of the 5 GFFCGs (target ≥30%)

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
					Residual risk: the ≥30% target may not be reached in every GFFCG immediately; addressed through annual monitoring and targeted recruitment drives where the target is unmet.				
1.3.1.b	Development of ToR, Guidelines & Planning Documents: Drafting, review, and validation workshops, Coordination meetings for endorsement and finalization	DoFPS/DLGDM	ToR/guidelines for GFFCG operation do not mandate gender-inclusion or OHS/safety standards for firefighting response	Low	Embed ≥30% women-participation target and mandatory PPE/safety protocol requirements directly in the GFFCG ToR and guidelines; Residual risk: low residual risk once ToR/guidelines are approved with these clauses; addressed through periodic compliance review of GFFCG operations against the approved guidelines.	Low	0	Cost included under activity	Approved ToR/guidelines document includes gender-inclusion and OHS clauses
1.3.1.c	Capacity Building & Training: training workshops for GFCG members on forest fire prevention and response	DoFPS/DLGDM	Physical hazard to GFFCG volunteers during firefighting-response training and drills (burns, smoke inhalation, injury) in Gewogs where 86-96% of forest cover is fire-sensitive vegetation	Medium	Mandatory safety/firefighting-response training module covering PPE use and hazard response for all GFFCG members; Residual risk: inherent hazard of fire-response training remains despite PPE and safety modules; addressed through trainers, on-site first-aid coverage and mandatory refresher drills.	Low	500		Training completion records for 100% of GFFCG members (target 30% women)
1.3.1.d	Procurement and distribution of Firefighting Tools & Basic Equipment.	DoFPS/DLGDM	Physical hazard to GFFCG volunteers during actual firefighting deployment if issued equipment lacks fire-resistant PPE	Medium	Include fire-resistant PPE (gloves, masks, protective clothing) within the firefighting equipment procurement for all 5 Gewog sets; Residual risk: firefighting deployment carries	Low	3,000		100% of GFFCG members issued PPE; Zero fatal/serious incidents

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
					irreducible physical hazard even with PPE; addressed through deployment protocols limiting volunteer exposure to high-risk fire fronts and mandatory incident reporting/review after each deployment.				
1.3.2.a	Development of Nature based adaptation solution for the forest fire suppression (Construction of the earthen dam) 1. Gewog: Kawang ((New Creation) Zilukha – 1 Wangdue Tse – 1	DoFPS/ DLGDM	Land use for earthen-dam siting without landowner/community consent;	Medium	Community/landowner consultation and written land-use consent prior to construction; Residual risk: low residual risk once consent is documented; addressed through periodic confirmation that land use remains consistent with the agreed consent terms.	Low	600		Signed consent for the dam site and consultation records
			Drowning/safety hazard from impounded water for children and livestock;	Medium	Install safety fencing and warning signage at the reservoir; Apply site-screening checklist to avoid wetlands/sensitive habitat before finalizing the site; Residual risk: residual drowning/safety hazard remains at any open-water structure despite fencing and signage; addressed through periodic inspection of fencing/signage integrity and community safety-awareness sessions.	Low	1,000		Safety signage/fencing installed; zero safety incidents reported

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
1.3.2.b	Development of Nature based adaptation solution for the forest fire suppression (Construction of the earthen dam): 4. Gewog: Geney Wangbama – 1 (New Creation)	DoFPS/ DLGDM	Land use for earthen-dam siting without landowner/community consent; minor impact on downstream flow or other water users	Medium	Community/landowner consultation and written land-use consent prior to construction; Residual risk: low residual risk once consent is documented; addressed through periodic confirmation that land use remains consistent with the agreed consent terms.	Low	600		Signed consent for the dam site and consultation records
			Drowning/safety hazard from impounded water for children and livestock; potential localized habitat/drainage alteration	Medium	Install safety fencing and warning signage at each reservoir; apply site-screening checklist to avoid wetlands/sensitive habitat before finalizing each site; Residual risk: residual drowning/safety hazard remains at any open-water structure despite fencing and signage; addressed through periodic inspection of fencing/signage integrity and community safety-awareness sessions.	Low	1,000		Safety signage/fencing installed at 100% of sites; Zero safety incidents reported
Output 2.1 Enhanced access to clean and safe drinking water									
2.1.1	2.1.1: Construction of Woluna Water Supply Scheme	DOID/ Dzongkhag	The water soruce for Woluna schem fall within Kabisa (another gewog). Risk of change in LS's water allocation in furture. Reduction of downstream environmental flow at the source;	Medium	Avail Kabisa gewog learance and water allocaiton approval from the Department of Water	Low		No cost exepected	Clearance letter from Kabisa gewog Water allication approvl from the Department of Water

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
			Land/way-leave required for Woluna pipeline route, intake and tank sites are located within State Reserved Forest land (Department of Forest). Risk of state forest plans and interventions	Medium	Forestry clearance from DoFPS to be south prior to start of the works	Low		No cost exepected	Forest Clearance from DoFPS
			Construction-related occupational health & safety hazards at Woluna (trenching, pipe-laying on steep terrain)	Medium	Contractor OHS Plan required in bidding documents; PPE provision and site safety supervision throughout construction; to be mentioned on the contract document of works Residual risk: standard construction OHS hazards remain despite the Contractor OHS Plan; addressed through unannounced site safety inspections and mandatory incident reporting to the PMU.	Low		Cost included in the design of the scheme within the activity	Contractor OHS Plan approved before mobilization; Zero reportable OHS incidents;
			Influx of construction workers at Woluna raises risk of gender-based violence / sexual exploitation, abuse and harassment (SEAH); child labour on construction/repair tasks	Medium	Mandatory Contractor Code of Conduct on GBV/SEAH and child labour; worker awareness sessions; Confidential GRM reporting channel; Referral pathway linked to RENEW/NCWC and Gewog health centres; Residual risk: SEAH risk cannot be fully eliminated during the construction period; addressed through sustained	Low		No cost exepected	Code of Conduct signed by 100% of contractors/workers; functioning confidential SEAH reporting channel; Zero unresolved SEAH cases

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
					Code of Conduct enforcement, active GRM monitoring and the RENEW/NCWC referral pathway remaining operational for the duration of works.				
			Unsafe water quality at Woluna commissioning if disinfection/testing is skipped	Medium	Mandatory water-quality testing before handover to WUA/community; Residual risk: low residual risk once the disinfection/testing Residual risk; addressed through periodic post-commissioning water-quality testing during operation.	Low	100	Cost of water qualiity testing prioir to hand over; Subsequent annual tarer tests to be supported by the community	Scheme passes water-quality test before commissionin g
			New settlers, remote and very poor households excluded from new connections at Woluna, replicating the exclusion pattern found in the existing system (25% of respondents of the household survey)	Medium	Adopt a 100%-household connection policy. Include advisory role of Tshogpas, elders and - where relevant - religious leaders within WUA governance structures Residual risk: a small number of eligible households may still be missed by Gewog welfare lists; addressed through a post-commissioning household verification survey and a standing grievance channel for connection requests.	Low	0	No cost exepected	% of target households connected including the Tsela monastery WUA charter inlucdes policy of 100% household coverage

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
2.1.2	2.1.2: Construction of Changtagang Water Supply Scheme	DOID/ Dzongkhag	Land/way-leave required for Changtagang pipeline route, intake and tank sites are located within State Reserved Forest land (Department of Forest). Risk of state forest plans and interventions Water Complications on water allocation Reduction of downstream environmental flow at the source;	Medium	Forestry clearance from DoFPS to be south prior to start of the works Water allocation approval from the Department of Water Ensure 30% eflow at sourece abstration point	Low		No cost exepected	Forest Clearance from DoFPS Record of discharge measurement and eflow/sbstraction Water allication approvl from the Department of Water
			Land/way-leave required for Woluna pipeline route, intake and tank sites are located within State Reserved Forest land (Department of Forest). Risk of state forest plans and interventions	Medium	Forestry clearance from DoFPS to be south prior to start of the works	Low		No cost exepected	Forest Clearance from DoFPS
			Construction-related occupational health & safety hazards (trenching, pipe-laying on steep terrain)	Medium	Contractor OHS Plan required in bidding documents; PPE provision and site safety supervision throughout construction; Residual risk: standard construction OHS hazards remain despite the Contractor OHS Plan; addressed through unannounced site safety inspections and mandatory incident reporting to the PMU.	Medium		Cost included in the design of the scheme within the activity	Contractor OHS Plan approved before mobilization; Zero reportable OHS incidents;

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
			Influx of construction workers at Changtagang raises risk of gender-based violence / sexual exploitation, abuse and harassment (SEAH); child labour on construction/repair tasks	Medium	Mandatory Contractor Code of Conduct on GBV/SEAH and child labour; worker awareness sessions; Confidential GRM reporting channel; Referral pathway linked to RENEW/NCWC and Gewog health centres; Residual risk: SEAH risk cannot be fully eliminated during the construction period; addressed through sustained Code of Conduct enforcement, active GRM monitoring and the RENEW/NCWC referral pathway remaining operational for the duration of works.	Low		No cost exepected	Code of Conduct signed by 100% of contractors/workers; functioning confidential SEAH reporting channel; Zero unresolved SEAH cases
			Unsafe water quality at Changtagang commissioning if disinfection/testing is skipped	Medium	Mandatory water-quality testing before handover to WUA/community; Residual risk: low residual risk once the disinfection/testing Residual risk; addressed through periodic post-commissioning water-quality testing during operation.	Low	100	Cost of water qualiity testing prioir to hand over; Subsequent annual tarer tests to be supported by the community	Scheme passes water-quality test before commissioning
			New settlers, remote and very poor households excluded from new connections at Woluna, replicating the exclusion pattern found in the existing system (25% of	Medium	Adopt a 100%-household connection policy Residual risk: a small number of eligible households may still be missed by Gewog welfare lists; addressed through a post-commissioning household verification survey and a	Low	0	No cost exepected	% of target households connected including the Tsewla monastery WUA charter inlucdes policy of 100%

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
			respondents of the household survey)		standing grievance channel for connection requests. Include advisory role of Tshogpas, elders and - where relevant - religious leaders within WUA governance structures				household coverage
2.1.3	2.1.3: Construction of Chamgang Water Supply Scheme	DOID/ Dzongkhag	Land/way-leave required for Chamgang pipeline route, intake and tank sites are located within State Reserved Forest land (Department of Forest). Risk of state forest plans and interventions Water Complications on water allocation Reduction of downstream environmental flow at the source;	Medium	Forestry clearance from DoFPS to be south prior to start of the works Water allocation approval from the Department of Water Ensure 30% eflow at sourece abstration point	Low		No cost exepected	Forest Clearance from DoFPS Record of discharge measurement and eflow/sbstraction Water allication approvl from the Department of Water
			Construction-related occupational health & safety hazards (trenching, pipe-laying on steep terrain)	Medium	Contractor OHS Plan required in bidding documents; PPE provision and site safety supervision throughout construction; Residual risk: standard construction OHS hazards remain despite the Contractor OHS Plan; addressed through unannounced site safety inspections and mandatory incident reporting to the PMU.	Medium		Cost included in the design of the scheme within the activity	Contractor OHS Plan approved before mobilization; Zero reportable OHS incidents;

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
			Influx of construction workers at Chamgang raises risk of gender-based violence / sexual exploitation, abuse and harassment (SEAH); child labour on construction/repair tasks	Medium	Mandatory Contractor Code of Conduct on GBV/SEAH and child labour; worker awareness sessions; Confidential GRM reporting channel; Referral pathway linked to RENEW/NCWC and Gewog health centres; Residual risk: SEAH risk cannot be fully eliminated during the construction period; addressed through sustained Code of Conduct enforcement, active GRM monitoring and the RENEW/NCWC referral pathway remaining operational for the duration of works.	Low		No cost exepected	Code of Conduct signed by 100% of contractors/workers; functioning confidential SEAH reporting channel; Zero unresolved SEAH cases
			Unsafe water quality at Chamgang commissioning if disinfection/testing is skipped	Medium	Mandatory water-quality testing before handover to WUA/community; Residual risk: low residual risk once the disinfection/testing Residual risk; addressed through periodic post-commissioning water-quality testing during operation.	Low	100	Cost of water qualiity testing prioir to hand over; Subsequent annual tarer tests to be supported by the community	Scheme passes water-quality test before commissioning
			New settlers, remote and very poor households excluded from new connections at Chamgang, replicating the exclusion pattern found in the existing system (25% of	Medium	Adopt a 100%-household connection policy Residual risk: a small number of eligible households may still be missed by Gewog welfare lists; addressed through a post-commissioning household verification survey and a	Low	0	No cost foreseen	% of target households connected WUA charter inlucdes policy of 100% household coverage

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
			respondents of the household survey)		standing grievance channel for connection requests. Include advisory role of Tshogpas, elders and - where relevant - religious leaders within WUA governance structures				
			The proposal for facilitating all distribution lines from one main distribution tank could overload the distribution point (pointed at the FGD in Chamgang)	Low	The main distribution tank to enable distribution line to existing sub-distribution tanks	Low		No cost foreseen	
2.1.4	2.1.4: Construction of Khasadrapchu Water Supply Scheme	DOID/ Dzongkhag	Land/way-leave required for Khasadrapchhu pipeline route, intake and tank sites are located within State Reserved Forest land (Department of Forest). Risk of state forest plans and interventions Water Complications on water allocation Reduction of downstream environmental flow at the source;	Medium	Forestry clearance from DoFPS to be south prior to start of the works Water allocation approval from the Department of Water Ensure 30% eflow at sourece abstration point	Low		No cost foreseen	Forest Clearance from DoFPS Record of discharge measurement and eflow/sbstraction Water allication approvl from the Department of Water
			Construction-related occupational health & safety hazards (trenching, pipe-laying on steep terrain)	Medium	Contractor OHS Plan required in bidding documents; PPE provision and site safety supervision throughout construction; Residual risk: standard	Medium		Cost included in the design of the scheme within the activity	Contractor OHS Plan approved before mobilization; Zero

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
					construction OHS hazards remain despite the Contractor OHS Plan; addressed through unannounced site safety inspections and mandatory incident reporting to the PMU.				reportable OHS incidents;
			Influx of construction workers at Khasadrapchu raises risk of gender-based violence / sexual exploitation, abuse and harassment (SEAH); child labour on construction/repair tasks	Medium	Mandatory Contractor Code of Conduct on GBV/SEAH and child labour; worker awareness sessions; Confidential GRM reporting channel; Referral pathway linked to RENEW/NCWC and Gewog health centres; Residual risk: SEAH risk cannot be fully eliminated during the construction period; addressed through sustained Code of Conduct enforcement, active GRM monitoring and the RENEW/NCWC referral pathway remaining operational for the duration of works.	Low		No cost foreseen	Code of Conduct signed by 100% of contractors/workers; functioning confidential SEAH reporting channel; Zero unresolved SEAH cases
			Unsafe water quality at Khasadrapchu commissioning if disinfection/testing is skipped	Medium	Mandatory water-quality testing before handover to WUA/community; Residual risk: low residual risk once the disinfection/testing Residual risk; addressed through periodic post-commissioning water-quality testing during operation.	Low	100	Cost of water qualiity testing prioir to hand over; Subsequent annual tarer tests to be supported by the community	Scheme passes water-quality test before commissioning

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
			New settlers, remote and very poor households excluded from new connections at Khasadrapchu, replicating the exclusion pattern found in the existing system (25% of respondents of the household survey)	Medium	Adopt a 100%-household connection policy Include advisory role of Tshogpas, elders and - where relevant - religious leaders within WUA governance structures Residual risk: a small number of eligible households may still be missed by Gewog welfare lists; addressed through a post-commissioning household verification survey and a standing grievance channel for connection requests.	Low	0	No cost foreseen	% of target households connected WUA charter inlucdes policy of 100% household coverage
			Risk of damage to existing Khasadrapchhu hydropower water line along the Jemina stretch	Low	Avail clearance from DGPC for alignment of pipeline along existing hydropower water line Residual risk: Monitoring visits by WUA members to check any impacts on the hydropoer water line	Low		No cost foreseen	Clearance from DGPC for alignment of pipeline along existing hydropower water line availed
			At the two sides of the over-hang river crossing of pipeline over Wangchhu, children may climb for fun and cause risk to their lives	Medium	To install protection measures on both sides of over-hang river crossing of pipeline over Wangchhu to ensure safety of children Residual risk: WUA ensures that the protection feasures are intact	Low	1,000		Children are not able to climb the pipe overhang across the rive Pipe support structure on both sides of the Wangchhi river are protected (fenced)

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
			Highway road crossing at Khasadrapchhu and Jemina road crossing of water pipeline may cause damage to road	Medium	Clearance to be sought from RSTA for highway crossing and Jemina road crossing Proper home pipes to be installed for road crossing Residual risk: WUA ensures that the Hume pipes enclosures are are intact	Low	0	Cost included in the activity design	No dagame to the hihghway and Kemina road Clearance documents from RSTA availaled for highway crossing and Jemina road crossing
2.1.5	2.1.5: Construction of Rama Water Supply Scheme	DOID/ Dzongkhag	Land/way-leave required for Rama pipeline route, intake and tank sites are located within State Reserved Forest land (Department of Forest). Risk of state forest plans and interventions Water Complications on water allocation Reduction of downstream environmental flow at the source;	Medium	Forestry clearance from DoFPS to be south prior to start of the works Water allocation approval from the Department of Water Ensure 30% eflow at sourece abstration point	Low		No cost foreseen	Forest Clearance from DoFPS Record of discharge measurement and eflow/sbstraction Water allocation approvl from the Department of Water
			Construction-related occupational health & safety hazards (trenching, pipe-laying on steep terrain)	Medium	Contractor OHS Plan required in bidding documents; PPE provision and site safety supervision throughout construction; Residual risk: standard construction OHS hazards remain despite the Contractor OHS Plan; addressed through unannounced site safety	Medium		Cost included in the design of the scheme within the activity	Contractor OHS Plan approved before mobilization; Zero reportable OHS incidents;

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
					inspections and mandatory incident reporting to the PMU.				
			Influx of construction workers at Rama raises risk of gender-based violence / sexual exploitation, abuse and harassment (SEAH); child labour on construction/repair tasks	Medium	Mandatory Contractor Code of Conduct on GBV/SEAH and child labour; worker awareness sessions; confidential GRM reporting channel; referral pathway linked to RENEW/NCWC and Gewog health centres; Residual risk: SEAH risk cannot be fully eliminated during the construction period; addressed through sustained Code of Conduct enforcement, active GRM monitoring and the RENEW/NCWC referral pathway remaining operational for the duration of works.	Low		No cost foreseen	Code of Conduct signed by 100% of contractors/workers; functioning confidential SEAH reporting channel; zero unresolved SEAH cases
			Unsafe water quality at Rama commissioning if disinfection/testing is skipped	Medium	Mandatory water-quality testing before handover to WUA/community; Residual risk: low residual risk once the disinfection/testing Residual risk; addressed through periodic post-commissioning water-quality testing during operation.	Low	100	Cost of water qualiity testing prioir to hand over; Subsequent annual tarer tests to be supported by the community	Scheme passes water-quality test before commissioning

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
			New settlers, remote and very poor households excluded from new connections at Rama, replicating the exclusion pattern found in the existing system (25% of respondents of the household survey)	Medium	Adopt a 100%-household connection policy Include advisory role of Tshogpas, elders and - where relevant - religious leaders within WUA governance structures Residual risk: a small number of eligible households may still be missed by Gewog welfare lists; addressed through a post-commissioning household verification survey and a standing grievance channel for connection requests.	Low	0	No cost foreseen	% of target households connected WUA charter inlucdes policy of 100% household coverage
Output 2.2: Enhanced access to adequate irrigation water									
2.2.1	2.2.1: Rehabilitation of Lower Woluna/Danglo Irrigation Channel	DOID/ Dzongkhag	Inequitable water distribution at Lower Woluna/Danglo favouring head-end farmers over tail-end farmers, landless sharecroppers and new settlers (confirmed by 23% of respondents)	Medium	Institutionalize a rotational water-allocation schedule in WUA by-laws with an explicit safeguard clause for tail-end farmers, landless sharecroppers and new settlers, informed by the traditional allocation practices documented in the household survey; Include advisory role of Tshogpas, elders and - where relevant - religious leaders within WUA governance structures Residual risk: informal head-end/tail-end imbalances may persist despite the by-law safeguard; addressed through WUA monitoring of rotational schedule compliance and	Low	0	No cost foreseen	WUA by-laws with tail-end/vulnerable-farmer safeguard clause adopted for the scheme

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
					GRM tracking of distribution-related grievances.				
			Construction-related occupational health & safety hazards (trenching, pipe-laying on steep terrain)	Medium	Contractor OHS Plan required in bidding documents; PPE provision and site safety supervision throughout construction; Residual risk: standard construction OHS hazards remain despite the Contractor OHS Plan; addressed through unannounced site safety inspections and mandatory incident reporting to the PMU.	Medium		Cost included in the design of the scheme within the activity	Contractor OHS Plan approved before mobilization; Zero reportable OHS incidents;
			Tempofary irrigation water shortages during rehabilitation works along the existing channel	Medium	Timing of rehabilitation work to planned during off peak agriculture activities. Peak agriculture activites are duing April, May, June, July	Low		No cost foreseen	Rahabilitation work schedule

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
2.2.2	2.2.2: Rehabilitation of Irrigation Channel from Dalukha to Khasakha	DOID/ Dzongkhag	Inequitable water distribution at Dalukha-Khasakha favouring head-end farmers over tail-end farmers, landless sharecroppers and new settlers (confirmed by 23% of respondents)	Medium	Institutionalize a rotational water-allocation schedule in WUA by-laws with an explicit safeguard clause for tail-end farmers, landless sharecroppers and new settlers, informed by the traditional allocation practices documented in the household survey; Include advisory role of Tshogpas, elders and - where relevant - religious leaders within WUA governance structures Residual risk: informal head-end/tail-end imbalances may persist despite the by-law safeguard; addressed through WUA monitoring of rotational schedule compliance and GRM tracking of distribution-related grievances.	Low		No cost foreseen	WUA by-laws with tail-end/vulnerable-farmer safeguard clause adopted for the scheme
			Construction-related occupational health & safety hazards (trenching, pipe-laying on steep terrain)	Medium	Contractor OHS Plan required in bidding documents; PPE provision and site safety supervision throughout construction; Residual risk: standard construction OHS hazards remain despite the Contractor OHS Plan; addressed through unannounced site safety inspections and mandatory incident reporting to the PMU.	Medium		Cost included in the design of the scheme within the activity	Contractor OHS Plan approved before mobilization; Zero reportable OHS incidents;

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
			Tempofary irrigation water shortages during rehabilitation works along the existing channel	Medium	Timing of rehabilitation work to planned during off peak agriculture activities. Peak agriculture activites are duing April, May, June, July	Low		No cost foreseen	Rahabilitation work schedule
2.2.3	2.2.3: Rehabilitation of Irrigation Channel from Dalukha to Dalulum	DOID/ Dzongkhag	Inequitable water distribution at Dalukha-Dalulum favouring head-end farmers over tail-end farmers, landless sharecroppers and new settlers (confirmed by 23% of respondents)		Institutionalize a rotational water-allocation schedule in WUA by-laws with an explicit safeguard clause for tail-end farmers, landless sharecroppers and new settlers, informed by the traditional allocation practices documented in the household survey; Include advisory role of Tshogpas, elders and - where relevant - religious leaders within WUA governance structures Residual risk: informal head-end/tail-end imbalances may persist despite the by-law safeguard; addressed through WUA monitoring of rotational schedule compliance and GRM tracking of distribution-related grievances.	Low		No cost foreseen	WUA by-laws with tail-end/vulnerable-farmer safeguard clause adopted for the scheme
			Construction-related occupational health & safety hazards (trenching, pipe-laying on steep terrain)	Medium	Contractor OHS Plan required in bidding documents; PPE provision and site safety supervision throughout construction; Residual risk: standard construction OHS hazards remain despite the Contractor OHS Plan; addressed through	Low		Cost included in the design of the scheme within the activity	Contractor OHS Plan approved before mobilization; Zero reportable OHS incidents;

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
					unannounced site safety inspections and mandatory incident reporting to the PMU.				
			Tempofary irrigation water shortages during rehabilitation works along the existing channel	Medium	Timing of rehabilitation work to planned during off peak agriculture activities. Peak agriculture activites are duing April, May, June, July	Low		No cost foreseen	Rahabilitation work schedule
2.2.4	2.2.4: Construction of Irrigation Scheme from Gangritueshay to Zangleykha	DOID/ Dzongkhag	Inequitable water distribution at Gangritueshay-Zangleykha favouring head-end farmers over tail-end farmers, landless sharecroppers and new settlers (confirmed by 23% of respondents)	Medium	Institutionalize a rotational water-allocation schedule in WUA by-laws with an explicit safeguard clause for tail-end farmers, landless sharecroppers and new settlers, informed by the traditional allocation practices documented in the household survey; Include advisory role of Tshogpas, elders and - where relevant - religious leaders within WUA governance structures Residual risk: informal head-end/tail-end imbalances may persist despite the by-law safeguard; addressed through WUA monitoring of rotational schedule compliance and GRM tracking of distribution-related grievances.	Low	0	No cost foreseen	WUA by-laws with tail-end/vulnerable-farmer safeguard clause adopted for the scheme

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
			Construction-related occupational health & safety hazards (trenching, pipe-laying on steep terrain)	Medium	Contractor OHS Plan required in bidding documents; PPE provision and site safety supervision throughout construction; Residual risk: standard construction OHS hazards remain despite the Contractor OHS Plan; addressed through unannounced site safety inspections and mandatory incident reporting to the PMU.	Low		Cost included in the design of the scheme within the activity	Contractor OHS Plan approved before mobilization; Zero reportable OHS incidents;
			Influx of construction workers raises risk of gender-based violence / sexual exploitation, abuse and harassment (SEAH); child labour on construction/repair tasks	Medium	Mandatory Contractor Code of Conduct on GBV/SEAH and child labour; worker awareness sessions; confidential GRM reporting channel; referral pathway linked to RENEW/NCWC and Gewog health centres; Residual risk: SEAH risk cannot be fully eliminated during the construction period; addressed through sustained Code of Conduct enforcement, active GRM monitoring and the RENEW/NCWC referral pathway remaining operational for the duration of works.	Low		No cost foreseen	Code of Conduct signed by 100% of contractors/workers; functioning confidential SEAH reporting channel; zero unresolved SEAH cases
			The tail end storage outlet above the Chezhi Goenpa may creat minor downstream soil erosions	Low	The tail end storage water outlet to be chanelled through a piped line into existing natural drainage west of Chezhi Goenpa. Avail clearance for chizhi Goenpa prior to tail end storage constrution	Low	500		No soil erosion from tail end storage water outlet Clearance from Chezhi Goenpa

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
					Residual risk: addressed through sustained WUA monitoring				availed prior to construction of the tail end storage construction.
Output 3.1 Community based Water User Associations (WUAs) strengthened for effective management of irrigation and drinking water.									
3.1.1.a	3.1.1a: Community engagement and WUA establishment or strengthening.	DoW	Elite capture of WUA office-bearer positions could skew future water allocation and O&M decisions in favour of a few households. Consultation meetings and WUA committee formation may be dominated by better-connected households or existing male leadership, sidelining women, isolated settlements, and elderly/female-headed households from decision-making over shared water resources	Medium	WUA by-laws to mandate a minimum 30% women in executive committees and at least one representative of vulnerable/new-settler households; Apply a documented stakeholder-mapping and targeted-outreach protocol to ensure marginalized/vulnerable households (isolated settlements, elderly-only, female/divorcee-headed) are specifically invited, with accessible timing/venue Residual risk: informal male/elite dominance of WUA decision-making may persist despite the quota clause; addressed through annual monitoring of women's/vulnerable-household representation on WUA executive committees and GRM tracking of exclusion-related grievances.	Low		Community engagement costed under the activity	% women in WUA executive committees (target ≥30%); WUA by-laws contain an inclusion clause for vulnerable/new-settler households

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
3.1.1.b	3.1.1b: Conduct training workshops on project management, financial management and monitoring and evaluation skills for community-based water user groups.	DoW	Training content for WUA office bearers does not build the specific financial/administrative capacity of women and vulnerable office bearers, undermining sustained inclusion	Low	Include a dedicated module on inclusive financial/administrative practice; monitor participation by sex and social group across all training sessions; Residual risk: capacity gaps for women/vulnerable office bearers may persist after initial training; addressed through refresher sessions and on-the-job mentoring during the first year of WUA operation.	Low	4,500		% women among trained office bearers (target ≥30%); training records disaggregated by sex
Output 3.2 Capacity of local communities, local leaders and organizations enhanced on local adaptation planning and implementation.									
3.2.1.a	Capacity building of Local Government functionaries on mainstreaming GECDP into local plans and programs.	DLGDM	Capacity-building training for LG functionaries may under-represent women, as Gewog leadership positions (Gup, Mangmi) are predominantly held by men in Bhutan	Medium	Set gender-balanced participation targets; schedule sessions at times/venues accessible to women local leaders and community members; Residual risk: structural under-representation of women in Gewog leadership may persist beyond individual sessions; addressed through continued tracking of the women-participation target across all subsequent LG capacity-building activities.	Low	0	No cost foreseen	% women participants in trainings (target ≥30%)
3.2.1.b	Procurement of local consultant for development of curriculum	DLGDM	Curriculum developed by the local consultant does not adequately reflect gender-responsive and inclusion content	Low	ToR for the curriculum consultancy to explicitly require a gender-responsive/inclusion module; Residual risk: low residual risk once the ToR clause is enforced; addressed through PMU review/approval of the	Low	0	Cost included in the activity	Final curriculum includes a dedicated gender/inclusion module

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
					final curriculum before rollout.				
3.2.1.c	Establishment of Community Engagement Platform in 5 targeted Gewogs.	DLGDM	Community Engagement Platforms in the 5 target Gewogs may under-represent women given predominantly male local leadership	Medium	Set gender-balanced participation targets for each platform; schedule sessions at times/venues accessible to women; Residual risk: structural under-representation of women in Gewog leadership may persist beyond individual sessions; addressed through continued tracking of the women-participation target across all subsequent LG capacity-building activities.	Low	750		% women participants in platforms (target ≥30%)
3.2.2.a	Provide capacity-building training on project management, financial management, and communication and advocacy skills for Gups, GAOs, Mangmis, concerned Tshogpas, DPO, EDMO, and Accountants.	DLGDM	Same gender-representation risk as Activity 3.2.1 for Gups/GAOs/Mangmis/Tshogpas/DPO/EDMO/Accountant training	Medium	Apply the same gender-balanced participation target and scheduling accommodation as Activity 3.2.1; Residual risk: structural under-representation of women in Gewog leadership may persist beyond individual sessions; addressed through continued tracking of the women-participation target across all subsequent LG capacity-building activities.	Low	0	Cost included in the activity	% women participants (target ≥30%)
3.2.3.a	Training on sustainable Management of Water Supply (Rural & Peri-Urban)- for	Dzongkhag/ Gewogs MOIT	Gender imbalance in the water-supply technical workforce limits women's access to technical capacity-building	Medium	Actively nominate and prioritize qualified women technicians for training slots; Residual risk: structural gender imbalance in the technical workforce may	Low		Cost included in the activity	% women among technicians trained (target ≥25%)

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
	technicians and engineers.				persist beyond this project; addressed through continued tracking of the women-participation target in all future training cohorts.				
3.2.3.b	Capacity building of engineers on design of water supply & Irrigation systems	Dzongkhag/ Gewogs MOIT	Gender imbalance in the engineering workforce limits women's access to design-focused technical capacity-building	Medium	Actively nominate and prioritize qualified women engineers for training slots; Residual risk: structural gender imbalance in the technical workforce may persist beyond this project; addressed through continued tracking of the women-participation target in all future training cohorts.	Low	500		% women among engineers trained (target ≥25%)
3.2.4.a	Conduct capacity-building programs for farmers on sustainable agricultural practices, climate-smart technologies, and resource-efficient farming.	DoA	Training timing may conflict with women's domestic/care workload (cooking, cleaning, water/fuelwood collection, childcare), reducing women farmers' attendance despite women being primary agricultural decision-makers per the survey	Medium	Schedule trainings at convenient times/locations for women; provide childcare support during sessions; targeted invitation of women farmers; Residual risk: some women farmers may still be unable to attend despite scheduling adjustments; addressed through make-up sessions and disaggregated attendance monitoring to identify further barriers.	Low	0	Cost included in the activity	% women among trained farmers (target ≥50%)
3.2.4.b	Provide training to extension agents on sustainable agricultural practices, including soil health management, water conservation, and	DoA	Training for extension agents does not equip them to deliver gender-responsive extension advice to women farmers	Low	Include a gender-responsive extension module; monitor share of women extension agents trained; Residual risk: low residual risk once the gender-responsive module is delivered; addressed through periodic review of extension advice	Low	0	Cost included in the activity	% women among trained extension agents; training includes gender-responsive

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
	integrated pest management.				quality reported by women farmers.				extension module
3.2.5.a	Provide training on disaster risk management to the LG functionaries and WUA	DLGDM	Training/awareness materials on disaster risk management may not reach the most disaster-vulnerable households (elderly, disabled, isolated) identified in the household survey	Medium	Include simplified/home-visit awareness materials for elderly, disabled and isolated households; partner with Gewog health workers/BHU for outreach; Residual risk: some elderly/disabled/isolated households may still be missed; addressed through Gewog health-worker/BHU follow-up visits to confirm outreach coverage.	Low	0	Cost included in the activity	Outreach records show elderly/disabled/isolated households reached by DRM awareness activities
Output 3.3 Project Results and Lessons Learned disseminated effectively									
3.3.1.a	Facilitate Participatory Learning, Knowledge Exchange, and Exposure Visits(both within & Ex country) among project stakeholders, including community members, local leaders, and implementing partners	PMU	Selection of participants for exposure visits/learning events dominated by elites or officials, excluding grassroots/women representatives	Low	Transparent, criteria-based selection process that includes women and vulnerable-group representatives; Residual risk: low residual risk once transparent selection criteria are applied; addressed through PMU review of participant lists against the criteria before each event.	Low	0	Cost included in the activity	Selection criteria and participant lists on file, disaggregated by sex and social group

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
3.3.2.a	Develop project brochures,briefs and dissemination	PMU	Dissemination materials inaccessible to low-literacy population (25% of respondents report no formal education) or non-Dzongkha speakers	Low	Produce pictorial/audio-visual and Dzongkha-language materials; use community radio/local dialect channels for dissemination; Residual risk: some non-Dzongkha speakers/low-literacy households may still be missed; addressed through periodic feedback collection on material accessibility and channel effectiveness.	Low	0	Cost included in the activity	Proportion of dissemination materials produced in accessible/local-language formats
3.3.3.a	Carry out project level Monitoring	PMU		Low		Low			Quarterly M&E reports include an ESMP/GAP/GRM status section
Sub-total: Activity-Level ESMP Mitigation Cost							**25,950**		
Cross-Cutting / Project-Wide Measures									
Project-wide	Establishment and operation of the Project Grievance Redress Mechanism (GRM)	PMU / Gewog Focal Persons / WUAs	Absence of an accessible, confidential and gender-responsive GRM leaves affected people (including SEAH survivors) without a safe channel to raise concerns, despite 72% of respondents already knowing where to report general concerns	Medium	Establish GRM registers/complaint boxes and trained focal persons at PMU and each of the 5 target Gewogs, with a confidential channel for SEAH-related complaints and links to RENEW/NCWC referral services; Residual risk: some affected people, particularly SEAH survivors, may still be reluctant to use the GRM; addressed through ongoing GRM awareness-raising and confidentiality safeguards reinforced at each Gewog session.	Medium	2,500		GRM operational in 100% of target Gewogs; all complaints logged and resolved/responded to within 30 days

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
Project-wide	Partnership for GBV/SEAH referral pathway with RENEW, NCWC and Gewog health centres	PMU Gender/ESS Focal Point	Survivors of GBV/SEAH linked to project workers/sites lack a functioning referral pathway to health, legal and psychosocial support	Medium	Formalize referral partnership agreements with RENEW, NCWC and Gewog Basic Health Units; disseminate referral information at all project sites; Residual risk: referral uptake may remain limited due to stigma/access barriers even with formal agreements in place; addressed through periodic review of referral-pathway functionality with RENEW/NCWC and confidential case tracking.	Medium	2,500		Signed referral partnership agreements in place; referral pathway information displayed at all project/construction sites
Project-wide	ESMP monitoring, photo-documentation and quarterly ESS/GAP reporting	PMU M&E / ESS Focal Point	ESMP mitigation measures not implemented or verified consistently across all Outputs, undermining AF reporting requirements (annual performance reports, mid-term/terminal evaluation)	Medium	Quarterly ESS/GAP compliance monitoring with photo-documentation of mitigation measures, consolidated into annual Project Performance Reports to the Adaptation Fund; Engage community (WUA) representatives for participatory monitoring at respective activity locations of project implementation Residual risk: low residual risk once quarterly monitoring is institutionalized; addressed through PMU cross-check of photo-documentation against the ESMP matrix each quarter.	Low	8,000		Quarterly ESS/GAP monitoring reports produced; annual PPR includes ESMP implementation status section

Activity No.	Activity / Sub-Activity	Responsible	Risk	Risk Significance	Mitigation Measure	Residual Risk	Cost (USD)	Remarks	Indicator
Project-wide	Project ESS Expert recruitment	BTFEC/IE	lack of ESMP updates, compilance monitoring and reporting may affect quality of project deliverables	Medium	Recruit one Porject ESS Expert for quarterly inputs of 15 days a quarter (8 m months spread over the project period)	Low	48,000		ESS Ezpert recruited
Sub-total: Cross-Cutting Measures							**61,000**		
GRAND TOTAL: ESMP Mitigation Cost							**86,950**		

3.6 Cost Summary

The total estimated cost of implementing the mitigation measures identified in this ESMP is USD 86,950 (USD 25,950 in activity-level measures across Tables 6–13 plus USD 61,000 in cross-cutting measures in Table 14, including the Project ESS Expert). This is validated against the USD 109,378.49 "ESS & GAP Mitigation" budget line already provisioned in the project's Main Sheet, confirming that the proposed measures are affordable within existing project financing, with a margin of approximately USD 22,428.49 remaining for Gender Action Plan-specific measures and implementation contingency. Table 15 below sets out this total by Component and Output.

Table 15: ESMP Cost Summary by Component and Output

Components/Outputs	Cost (USD)
1: Ecosystem based adaptation to ensure natural capacity for water infiltration, recharge and water buffering implemented	18,200
1.1 Water Resource Management & Governance strengthened	4,000
1.2: EbA solutions & SLM to enhance watershed functions; minimise the impact of floods and extreme rainfall implemented.	7,500
1.3 Mitigation of forest fire hazards by promoting integrated forest fire management.	6,700
2: Community-based climate resilient drinking water and irrigation infrastructure established	2,000
2.1 Enhanced access to clean and safe drinking water	1,500
2.2: Enhanced access to adequate irrigation water	500
3: Capacity of local communities and organizations on knowledge and skills related to sustainable water resource management, local climate adaptation planning and implementation enhanced.	5,750
3.1 Community based Water User Associations (WUAs) strengthened for effective management of irrigation and drinking water.	4,500
3.2 Capacity of local communities, local leaders and organizations enhanced on local adaptation planning and implementation.	1,250
3.3 Project Results and Lessons Learned disseminated effectively.	0
Cross-Cutting / Project-Wide Measures	61,000
TOTAL ESTIMATED ESMP MITIGATION COST	86,950

3.7 Monitoring, Reporting and Evaluation

ESMP implementation will be monitored through the following mechanisms:

- Quarterly ESS compliance monitoring by the PMU ESS and Gender Focal Point, using the indicators specified in Section 3.5, with photo-documentation of key mitigation measures (e.g., erosion-control structures, PPE distribution, signed consent/compensation agreements).
- Site-level monitoring by Executing Entities (DoW, DOID, DoFPS, DoA, DLGDM) for activities under their respective outputs, reported to the PMU on a quarterly basis.
- Community-based monitoring by WUAs and GFFCGs, feeding into the GRM case log and quarterly reports.
- Annual Project Performance Reports (APRs) to the Adaptation Fund via BTFEC, including a dedicated ESMP/GAP implementation status section.
- Mid-term and terminal evaluations to assess the overall effectiveness of ESMP implementation and recommend corrective measures.

3.8 Grievance Redress Mechanism (GRM)

A multi-tiered, confidential and gender-responsive GRM will be established, building on the fact that 72% of surveyed households already know where to report general concerns and 74% know where to report SEAH-related concerns:

- Tier 1 - Gewog level: trained Gewog focal persons (Tshogpas/GAOs) receive and log complaints using a standard GRM register; simple complaints resolved within 15 days.
- Tier 2 - Dzongkhag/PMU level: complaints not resolved at Gewog level, or of a sensitive nature (e.g., land compensation disputes, SEAH), are escalated to the PMU ESS and Gender Focal Point for resolution within 30 days.
- SEAH-specific channel: a confidential, survivor-centered reporting channel with direct referral to RENEW, the National Commission for Women and Children (NCWC) and Gewog Basic Health Units, independent of the general GRM register.
- The GRM will be disclosed to all communities and displayed at all project/construction sites in Dzongkha and, where relevant, local dialects, alongside contact details for each tier.
- All grievances and their resolution status will be logged and reported in the quarterly ESS/GAP monitoring reports referenced in Section 3.7.

3.9 Capacity Building for ESMP Implementation

The following capacity-building measures support effective ESMP implementation and are costed within the relevant activity lines in Section 3.5 and the cross-cutting measures table:

- OHS, GBV/SEAH-prevention and child-labour-prevention training integrated into contractor induction and GFFCG capacity-building activities.
- Training for the PMU ESS and Gender Focal Point on Adaptation Fund ESP requirements, GRM management and ESMP monitoring and reporting.
- Training for WUA office bearers (90 individuals across 9 WUAs) on inclusive governance, by-law development and equitable water allocation, informed by the household survey findings on access inequity.

3.10 Disclosure and Consultation Plan

This ESS Screening and ESMP will be disclosed prior to project approval consistent with the Adaptation Fund's disclosure requirements, and consultation will continue throughout implementation:

- Disclosure of the ESMP summary (in Dzongkha and English) at Gewog Centers and through Gewog/Dzongkhag Administration channels, addressing the finding that only 33% of surveyed households currently fully understand project roles and responsibilities.
- Free, prior and informed consultation with affected households before finalizing any pipeline/infrastructure alignment that may affect land use, sacred sites or customary water allocation practices.
- Continued engagement with religious custodians (including of the Chizhi Gonpa, Genekha) prior to finalizing designs near identified sacred sites.
- Annual public disclosure of ESMP implementation status and GRM case summary (anonymized) at community meetings, coordinated by the PMU and Gewog Administrations.

3.11 Summary and Conclusion

This ESS Screening confirms that the project should be categorized as Category B under the Adaptation Fund Environmental and Social Policy: potential adverse environmental and social impacts are limited in scale, site-specific, and readily addressed through the mitigation measures set out in this ESMP. The accompanying ESMP identifies and costs mitigation measures for every activity and sub-activity across the project's three components, strengthened by evidence from the household survey of 231 respondents in the target Gewogs and participatory project screening during community level stakeholder consultations held from 13th to 17th July 2026 in the five project gewogs where 170 community members (93 men and 77 women p) participated in addition to local officials. The total estimated cost of implementing these measures is USD 86,950 for (48,00 for ESS expert from AFE fees and 38,950 for ESS activities from the program).

Successful implementation will depend on the institutional arrangements, monitoring and grievance redress mechanisms described above, and on continued, inclusive consultation with affected communities throughout the project period.

Annex 4: Analysis of Indigenous Knowledge, Strategies and Traditional Practices in Water Management and Ecosystem-based Adaptation

Thimphu Rural District (Kawang, Mewang, Geney/Genekha, Chang and Dagala Gewogs), Bhutan

1. Purpose, Scope and Methodology

This document is a record and analysis of the indigenous knowledge (IK), strategies and traditional practices used in water management and Ecosystem-based Adaptation (EbA) in the project area within the overall national context. It draws on three complementary sources:

- Primary evidence base: ILK Literature Review Findings, which synthesizes global and Bhutan-specific literature on Indigenous/Local Knowledge (ILK) systems, local ecological knowledge (LEK), cultural-spiritual values, governance institutions, and their application to water management and EbA.

- Corroborating and supplementary evidence: Household Survey on "Securing Water and Enhancing Climate Resilience in Thimphu (rural) District", comprising 231 valid household responses (137 women, 93 men) across the five Gewogs, of which 68.4% of respondents have resided in their village for 15+ years, strengthening the reliability of their recall of customary practices.

- Field-level corroboration: Community Consultations/Focus Group Discussions (FGDs) held across all five project Gewogs between 13–17 July 2026, reaching 170 participants (93 male, 77 female — 45% female representation):

Gewog	Date	Male	Female	Total	Female %
Genekha	13-Jul-26	21	11	32	34%
Maedwang	14-Jul-26	35	27	62	44%
Chang	15-Jul-26	7	11	18	61%
Dagala)	16-Jul-26	21	21	42	50%
Kawang	17-Jul-26	9	7	16	44%
Total	**13–17 Jul 2026**	**93**	**77**	**170**	**45%**

These consultations combined plenary discussions and structured FGD included overall water management and customary practices and institutions that grounds the survey's more abstract cultural-heritage findings in an actual project decision point.

The ILK theme identified in the literature is checked against matching household-survey and community-consultation evidence, and the degree of corroboration (Popularly Acknowledged/partially confirmed/nuanced/gap/newly recorded) is reported. Where either supplementary source provides data not explicitly covered in the literature (e.g., erosion of practice, gendered patterns, perceived fairness of customary rules, or entirely new customary institutions) which is treated as supplementary evidence that deepens and extends the analysis.

2. Conceptual Framework: ILK, LEK and EbA

The literature review defines Indigenous/Local Knowledge (IK) as a cumulative body of knowledge, beliefs, practices and customs evolved through adaptive processes and transmitted across generations, rooted in a community's ties to land, environment and way of life[1]. For water management specifically, IK is characterized by four features:

- **Experience-based and adaptive:** built on historical observation of rainfall, drought, rivers and groundwater[2].
- **Holistic and ecosystem-linked:** water is managed as part of integrated socio-ecological systems (forests, soils, biodiversity), not in isolation.
- **Cultural and spiritual:** water bodies are frequently sacred or spirit-inhabited, reinforcing conservation ethics[3].
- **Governed collectively:** community-based stewardship and customary rules take precedence over individual ownership[4].

Ecosystem-based Adaptation (EbA): uses biodiversity and ecosystem services (forests, wetlands, watersheds) to reduce climate risk, regulate water and build drought/flood resilience . The literature review synthesises the IK–EbA relationship into three reinforcing facets:

i. the knowledge system (indigenous observations, practices, beliefs),
ii. the resource focus (water systems embedded in rivers, springs, forests and mountains), and
iii. the adaptation strategy (ecosystem-based use of biodiversity and community governance) — together forming a nature-based adaptation system grounded in local understanding[5], and IK's inclusion in EbA design is shown to reduce maladaptation and strengthen community acceptance[6].

This framing is directly supported by the household survey: 76.6% of Thimphu rural respondents still believe in taboos or spiritual restrictions tied to water sources, and 57.6% consider that associated rituals can meaningfully support modern safeguard measures — empirical confirmation that the cultural-spiritual dimension of IK described in the literature is a live, functioning system in the project area, not a historical relic.

3. Bhutan's Indigenous Knowledge System — Contextual Overview

[1] Understanding How Indigenous Knowledge Contributes to Climate Change Adaptation and Resilience: A Systematic Literature Review; IPBES, Environmental Management.
[2] Indigenous knowledge systems in sustainable water conservation and management, ScienceDirect
[3] Indigenous practices of ecosystem management in a changing climate: Prospects for ecosystem-based adaptation. Science Direct
[4] The need for Indigenous knowledge-based water and drought policy in a changing world. Science Direct
[5] The Roles of Adaptive Water Governance in Enhancing the Transition towards Ecosystem-Based Adaptation. MDPI
[6] The Role of Indigenous and Traditional Knowledge in Ecosystem-Based Adaptation: A Review of the Literature and Case Studies from the Pacific Islands https://www.pacificecoadapt.org/publications/using-local-indigenous-knowledge-to-inform-ecosystem-based-adaptation/?utm_source=chatgpt.com

The literature situates Bhutanese Local Ecological Knowledge (LEK) within the framework of Gross National Happiness and Buddhist environmental ethics[7], identifying three defining characteristics:

i. holistic and spiritual, inseparable from Buddhist principles where nature is sacred and inhabited by local deities (*yul-lha, lu, tsen, sa-dak, zhi-dak, nye-dak*)[8];
ii. community-based and orally transmitted, passed through elders, farmers and monastic institutions; and
iii. adaptive and context-specific, varying by ecological zone and evolving with climate and socio-economic change[9].

Bhutanese LEK is practiced across five domains: agriculture, transhumant agro-pastoralism, forest and biodiversity management, ethnomedicine/Sowa Rigpa, and climate/environmental forecasting. Of these, water management and ecological forecasting are the most directly relevant to this documentation and are detailed in Section 4.

4. Recorded ILK Practices, Strategies and Traditional Practices in Water Management and EbA

The following four sub-sections mirror the literature review's own structuring of Bhutanese IK application in water management. Each practice is presented alongside corroborating (or supplementary) household-survey evidence from the project area.

4.1 Watershed and Spring (*Drupchhu*) Protection

Documented in the literature: - Forests, mountains, rivers, lakes and springs are treated as sacred, inhabited by local deities/spirits (*sa-dak, zhi-dak, nye-dak, yul-lha, lu, tsen*), which underpins informal prohibitions on cutting trees, timber extraction, grazing, pollution and hunting in watershed areas — protecting these as de facto sacred groves[10].

Rituals such as *soelkha* (offerings) and *rimdo* (appeasement ceremonies) are performed to maintain harmony between humans and nature. Community forest management (CFM) regulate fuelwood/timber extraction in upstream catchments on the principle of "healthy forests for healthy water sources," with buffer-vegetation protection around springs and streams. Terracing, vegetative barriers and agroforestry stabilize sloping land and reduce sedimentation (literature review, general practice observation — no distinct external citation).

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[7] Understanding Cultural, Ecological, and Indigenous Literacy in Rural Bhutan: A Case Study of Gangtey Gewog https://www.researchgate.net/publication/376613497_

[8] Collective responsibility and environmental caretaking: toward an ecological care ethic with evidence from Bhutan, Ecology and Society 28(1):10. https://doi.org/10.5751/ES-13776-280110

[9] Example, wet rice cultivation in Punakha valley, and pastoral systems in Bumthang valley.

[10] Religion and Environment in Bhutan, https://doi.org/10.1093/acrefore/9780190277727.013.827 and Spirits and Nature: The Intertwining of Sacred Cosmologies and Environmental Conservation in Bhutan, Journal for the Study of Religion, Nature and Culture, 2017.

Drupchhu (springs) are respected as holy, with prohibitions on washing, grazing or polluting near the source, and natural vegetation is deliberately maintained around them to sustain recharge — the traditional precursor to modern spring-shed management.

Local institutions (Gewog, Tshogpa) enforce customary grazing/harvesting limits in catchments. The modern Payment for Ecosystem Services (PES) model is itself rooted in traditional upstream–downstream reciprocity[11].

Household survey corroboration (Thimphu rural district):

Practice / belief	Survey finding
Belief in taboos/spiritual restrictions on water sources	• 76.6% yes (F 77.4% / M 75.3%)
Rituals seen as able to meaningfully support modern safeguards	• 57.6% agree
Tree planting around water sources (recognised traditional practice)	• 48.5%
No-cutting rules near springs/streams	• 46.8%
Fencing/enclosure of water sources	• 45.5%
Restriction on grazing near catchments	• 33.3%
Community patrol/watch systems	• 21.2%
Sacred spring protection (as a recognised traditional *harvesting-related* method)	• 18.2% (F 14.6% / M 23.7%)
Sacred/culturally significant site reported near existing or proposed water infrastructure	• 19.9% (F 18.2% / M 22.6%)
Top perceived threats to catchments	• Logging 45.5%, • road/infrastructure building 44.2%, • forest fires 39.8%

Analysis: The survey strongly corroborates the literature's core claim that spiritual/taboo-based watershed protection is alive and widely held (76.6%), while formal-practice indicators (tree planting, no-cutting rules, fencing — all ~45–49%) confirm that roughly half of households still actively observe these customary catchment-protection behaviours.

Community consultation case study: Chizhi Gompa (Genye Gewog): The July 2026 field consultations provide a concrete, real-world instance of exactly this dynamic. The proposed scheme end point sits above Chizhi Gompa, a monastic body inside the village boundary, on a steep slope that coincides with the natural drainage pathway — creating both a physical flood hazard. Communities explicitly identified that formal clearance must be obtained from Chizhi Gompa before construction can proceed, alongside standard WUA clearance — directly operationalising the literature's account of sacred sites imposing customary restrictions on land use near water infrastructure. As a mitigation measure, communities proposed that tail-end overflow be discharged via a piped outlet into the natural drain on the left bank of Chizhi Goenpa, rather than risk uncontrolled overflow near the monastic site. it demonstrates that when communities are directly consulted (rather than surveyed abstractly), required safeguard measures can be

[11] A Milestone for Community-Led Conservation: PES Agreement Signed for Omchhu Watershed, TARAYANA Foundation

identified with precision, resolving in practice the kind of "don't know" uncertainty that the household survey found at scale (45.9%).

4.2 Rainwater Harvesting

Documented in the literature: - Traditional systems are designed to "work with nature": gravity flow and natural storage using local, low-cost materials (bamboo, wood, stone, earth), avoiding complex infrastructure[12]. Construction and maintenance rely on collective labour contribution (*zhabto lemi*), a strong social norm of cooperation, reinforced by the belief that water is sacred and rituals related to water protection sustain conservation ethics[13]. At household level: rooftop rainwater is collected via wooden containers (*waa*), bamboo gutters or carved wooden channels, especially in highland areas and monasteries/pilgrimage sites where springs are distant; storage vessels are covered and kept shaded to preserve water quality. An indigenous water-quality-management practice grounded in the belief that water must be kept pure. Modern rooftop rainwater-harvesting programmes with storage tanks are a direct evolution of this traditional system[14], promoted as a complementary water source in water-scarce rural districts.

Household survey corroboration:

Practice	Survey finding
Community water tanks (traditional harvesting method, by far the most 5ecognized)	• 80.5% (F 80.3% / M 81.7%)
Small ponds	• 26.0%
Roof (rooftop) harvesting	• 9.1% (F 5.8% / M 12.9%)
Earthen bunds	• 6.9%
Bamboo channels	• 3.0%
Rainwater harvesting pits used to cope with water-scarce periods	• 40.7% — the single most-cited coping practice
Current use status of traditional harvesting practices	• Widely used 32.5%; • used by some households 23.8%; • rarely used 26.0%; • no longer used 17.7%

Analysis: The survey confirms all the literature's documented rainwater-harvesting techniques are recognized in the project area, with community water tanks emerging as the dominant traditional storage practice (80.5%), a scale of shared infrastructure the literature frames more generically but the survey quantifies precisely for this district. The 40.7% reliance on rainwater-harvesting pits as a drought-coping strategy is the single most-used coping mechanism in the entire survey, underscoring how central this ILK practice remains to household water security. However, the 17.7% "no longer used" figure (rising to 20.4% among men) is an important supplementary finding: it quantifies a gradual

[12] Asian Development Bank & National Environment Commission ((2016). Water: Securing Bhutan's future. https://www.adb.org/sites/default/files/publication/190540/water-bhutan-future.pdf

[13] Resilience of Traditional Ritual Practices in Bhutanese Mountain Farming Systems Amid Climate Change and Anthropogenic Activities. Mountain Research and Development. https://www.jstor.org/stable/48714783

[14] Assessment of Water Shortage and Potential for Rooftop Rainwater Harvesting in Rural Development Training Centre, Zhemgang Town, Bhutan. Bhutan Journal of Natural Resources and Development. https://doi.org/10.17102/bjnrd.v7i1.44

erosion of traditional harvesting knowledge/practice that the literature notes only qualitatively (as a general risk to IK sustainability), making a strong case for a dedicated ILK documentation and knowledge-transfer activity within the project.

4.3 Sustainable / Traditional Irrigation Systems

Documented in the literature: The farmer-managed *chhuzhing* (wetland/paddy) irrigation system diverts water from streams via small weirs into earthen or stone-lined canals along slopes, distributed sequentially from upper to lower terraces - minimizing water wastage and soil erosion through reuse of excess water downstream[15].

Community rules govern rotational, "use-by-turn" water distribution with penalties for misuse, ensuring equity and built-in conflict resolution. The system is environmentally sustainable (gravity-fed, no energy input), socially sustainable (collective ownership, customary law, intergenerational knowledge transfer) and economically sustainable (low-cost local materials and labour). Modern Water User Associations (WUAs) represent the formal-governance evolution of this indigenous canal-management tradition, though the literature flags landslide damage to canals, declining community participation and weak technical capacity as ongoing challenges[16]. Water governance is traditionally led by a locally appointed water manager, the *chhupon/chusub,* who enforces customary allocation rules for the equivalent role in seasonal allocation, Section 4.4).

Household survey corroboration:

Practice / institution	Survey finding
Historical water-allocation decision-makers	• Water User Association 57.1%; • Tshogpa 40.3% (F 46.7% / M 30.1%); • Informal community groups 34.6%
Traditional allocation schedule	• Taking turns by day 38.1% (most recalled); • Taking turns by time of day 20.3%; • Upstream–downstream rules 10.4%; • None used 25.1%
Traditional conflict-resolution methods for water sharing	• Community meetings 65.4%; • Mediation by Tshogpa/Gewog Office 41.1%; • Mediation by elders 18.6%; • Fines/penalties 10.4%; • WUA-based mediation 9.5%
Irrigation water sources	• Canals 37.7%; • River/spring sources 35.9%
Perceived fairness of traditional rules to poor households, women, tenants and people with disabilities	• Mostly fair 45.9%; • Sometimes unfair 27.7%; • Often unfair 10.0%

Analysis: The survey validates every core mechanism the literature describes which include rotational ("turn-based") allocation, canal-based gravity irrigation, and Tshogpa/community-based conflict resolution and adds crucial equity data the literature does not quantify: 37.7% of households view traditional allocation rules as sometimes or

[15] Farmer-managed irrigation systems in Bhutan, No H007298, IWMI Books, Reports, International Water Management Institute
[16] Challenges facing sustainable irrigation system in Bhutan

often unfair to poor households, women, tenants or people with disabilities. This is a significant supplementary finding: while the literature frames traditional irrigation governance as inherently equitable ("community rules… ensure equitable and sustainable water sharing"), the household evidence shows this equity is only partial in practice, and the project's new WUA by-laws must explicitly correct - not simply reproduce — these customary gaps (consistent with ESS Principles 2/3 on Access and Equity and Marginalized/Vulnerable Groups).

Community consultation corroboration: The literature's *chhupon/Chusup* concept (Section 4.3 above) and the survey's inability to isolate a distinct "chupon" title (Section 6) are directly resolved by the July 2026 FGDs. The existing WUA office-bearer structure has Chairperson, Secretary, Treasurer and *Chusub* - the *Chusub* being the on-the-ground responsible for day-to-day water distribution and monitoring, functioning as the present-day equivalent of the literature's *chupon* (exact scope of duties to be confirmed directly with the WUA in a follow-up visit). The Dalukha WUA has members serving comprising of (originally registered plus newly identified), and operates a baseline allocation regime that itself embeds traditional, rotation-based logic into current practice: an 8-hour daily drop cycle (half-day supply), a 15-day dry-season rate, and a Gup-managed 8-day allocation cycle during periods of scarcity in Khasakha/Dalukha. Each chiwog's WUA is independently constituted with its own bylaws and are partly financed through annual membership fees held in a dedicated bank account or with the WUA. These WUAs are mostly not registered under the Bhutan Water Act (2011) and Water Regulation (2014).

Newly documented customary practice: Consultations recorded a customary system called *Gyen* - a rotational arrangement whereby households take turns bearing responsibility for maintaining shared community assets (such as irrigation canals, tanks and access infrastructure). This is a genuinely new finding (not previously identified in either the ILK literature review or the household survey instrument) but one that has been in practices for generations and functions as a labour-contribution analogue to the collective-labour practice (*zhabto lemi*) the literature documents for rainwater-harvesting infrastructure (Section 4.2), extended here specifically to irrigation-system upkeep. *Gyen* should be recorded as a distinct, additional ILK practice in its own right, and considered for formal recognition within new WUA operations-and-maintenance arrangements rather than left as an informal, undocumented convention.

4.4 Seasonal Water-Use Adaptation and Ecological Forecasting

Documented in the literature: Bhutan's highly seasonal hydrology (monsoon abundance vs winter/spring scarcity) is managed through: spring/source protection (maintaining forest cover, restricting grazing/felling, performing water-deity rituals); seasonal diversion and small-scale storage (temporary channels, small earthen/stone ponds); rainwater storage rationed through the dry season; seasonal mobility of livestock and diversified livelihoods; crop-calendar adjustment (drought-tolerant crops like millet and buckwheat during dry seasons); and social/cultural regulation of water use (prohibitions on washing/polluting during scarcity, rotational sharing, prioritization of drinking water and paddy transplantation). Weather and water-availability forecasting

relies on local ecological indicators: atmospheric signs (wind direction, cloud formation, prolonged heat/cold)[17]; plant phenology (flowering/fruiting timing signaling monsoon onset, animal and bird behavior (migratory bird arrival/departure, livestock movement, frog/amphibian activity)[18]; and cryospheric indicators (snow cover, glacier melt timing). Bhutan's more than 700 recorded bird species make avian behaviour a particularly rich forecasting resource, with eastern Bhutan case studies integrating farmer knowledge and scientific approaches for environmental management[19]. The Chupon (locally appointed water managers) enforce seasonal allocation rules, embedding this adaptive governance into formal Water Users Association structures.

Household survey corroboration:

Practice	Survey finding
Farming practices used to cope with water-scarce periods (multi-select)	• Rainwater harvesting pits 40.7%; • Crop rotation 35.1%; • Rituals to appease local deities for rain 28.1% (F 29.9% / M 25.8%); • Adapting farming calendar using BBS weather/climate information 26.0%; • Mulching with leaves 14.7%; • Agroforestry 14.7%; • Drought-resistant local seed varieties 11.3%

Analysis: The survey confirms the literature's central claim of a hybrid ILK–modern coping system: nearly three in ten households (28.1%) still perform rain-invoking rituals for local deities *alongside* modern weather-information use (26.0%) and agronomic adaptation (crop rotation, mulching). This is a live, functioning spiritual-ecological practice, not a residual belief, and is slightly more prevalent among women (29.9%) than men (25.8%) - an important gender nuance for consultation design. The literature's detailed catalogue of plant-phenology and bird/animal-behaviour indicators is not separately captured by the current survey instrument (a data gap the project should address through a supplementary seasonal-calendar/indicator-mapping exercise with elders, ideally disaggregated by gender), but the underlying practice of rain ritual and calendar adjustment is independently confirmed at household level.

5. Cultural Beliefs, Taboos and Traditional Governance Institutions

Documented in the literature: Bhutanese IK is deeply shaped by Buddhist philosophy, pre-Buddhist animistic (Bon) traditions, and sacred relationships with nature. Moral-spiritual principles of karma (*ley judrey*), compassion (*nying-je*), sacred commitment (*tha damtshig*), and non-harm (*ahimsa*) shape everyday environmental behaviour, and are reinforced through education and youth-development programmes linking spiritual wisdom to well-being. Community governance is collective and consensus-based, rooted

[17] Perception of farmers on climate change and its impacts on agriculture across various altitudinal zones of Bhutan Himalayas, International Journal of Environmental Science and Technology. doi.org/10.1007/s13762-020-02662-8

[18] Integrating ethnobiological knowledge into biodiversity conservation in the Eastern Himalayas, Journal of Ethnobiology and Ethnomedicine. https://doi.org/10.1186/s13002-017-0148-9

[19] *Participatory Ecological Assessment of Farmer Perspectives on Management of Invasive Ageratina adenophora in Eastern Bhutan*. doi: 10.1002/pei3.70110

in customary law: village elders, Tshogpas and informal community groups mediate conflicts, enforce customary rules (e.g., *Tsamdro* rangeland management, grazing limits, irrigation scheduling)[20], and increasingly co-manage resources in hybrid arrangements with the modern state (e.g., Land Act reforms, WUAs)[21].

Household survey corroboration:

Institution / belief	Survey finding
Traditional institutions referenced for natural-resource governance	• Tshogpa/village head 52.4%; • Village elders 41.6%; • Informal community consensus 33.8%; • Religious leaders (Lam/Gomchen) 27.7%
Belief in taboos/spiritual restrictions on water sources	• 76.6%
Intergenerational ILK transfer perceived as;	• Stronger among youth - 35.9% • About the same - 32.0% • Weaker - 22.1%
Main weaknesses of ILK-based resource management	• Limited capacity/resources 63.6%; • Climate vulnerability beyond traditional methods 38.5%; • Technology/knowledge gap vs. modern methods 34.2%; • Weakening institutional enforcement 19.5%; • loss of youth interest 16.9%

Analysis: The survey confirms the literature's central governance finding that Tshogpas, elders and (to a lesser extent) religious leaders remain the primary, trusted reference points for resource stewardship, well ahead of any purely modern institution. It also supplies an important nuance the literature does not quantify: household perceptions of intergenerational knowledge transfer are cautiously optimistic (68% report it as "stronger" or "the same"), yet this sits in tension with the independently observed 17.7% decline in active use of traditional harvesting practices (Section 4.2) — suggesting perceived cultural continuity may be outpacing actual practice continuity, and warranting a qualitative follow-up (e.g., focus-group discussions) rather than resting on the optimistic self-report alone.

Newly documented customary institution: The July 2026 community consultations (Genye Gewog, Chizhi/Zanglam area) a distinct customary governance practice called *Dedrik*, a local mechanism through which adjoining landowners agree to adjust their shared land boundaries specifically to accommodate the siting of community infrastructure (such as irrigation canals, tanks or access paths). Like *Gyen* (Section 4.3), this is a genuinely new finding, absent from both the literature review and the survey instrument, and represents an existing, community-endorsed customary tool for resolving

[20] Exploring governance structures of high-altitude rangeland in Bhutan using Ostrom's design principles. *International Journal of the Commons*, 2018. https://doi.org/10.18352/ijc.828

[21] *Governance of rangeland in Bhutan: Institutions and policy initiatives*, Pastoralism. https://doi.org/10.1186/s13570-023-00284-6

exactly the kind of land-related siting conflict that formal land-acquisition processes often struggle with. *Dedrik* is directly relevant to Section 8's project-design implications: rather than defaulting solely to formal compensation/easement procedures, the project can explore recognising *Dedrik* as a legitimate, faster, and locally trusted first-resort mechanism for infrastructure-related land adjustments, provided it is documented transparently to avoid informal grievances, consistent with ESS Principle 15 (Lands and Soil Conservation).

Traditional governance in practice: Consultations confirm that Dagala's highland communities continue to combine transhumant/seasonal pastoralism (yak herding, moving with the seasons) with small-scale agriculture and seasonal medicinal-plant collection, a living example of the literature's broader account of seasonal mobility as a traditional water and resource-stress coping strategy (Section 4.4), and a reminder that ILK practices in this project area extend beyond irrigation and water storage into pastoral land-use governance.

6. Corroboration Summary Matrix

ILK theme (literature)	Literature evidence	Survey / community-consultation corroboration	Status
Sacred watershed/forest protection, spirit beliefs	Sacred groves, restrictions on cutting/grazing/pollution near water sources	76.6% belief in taboos; 45–49% observe tree-planting/no cutting/fencing	• *Popularly Acknowledged*
Rituals (*soelkha, rimdo*) for water/nature harmony	Rituals performed for harmony with water deities	• 28.1% still perform rain-appeasement rituals; 57.6% see rituals as compatible with modern safeguards	• *Popularly Acknowledged, and* • *shown to be live/functioning*
Spring (*drupchhu*) protection	Springs treated as holy; vegetation maintained for recharge	• 18.2% cite sacred-spring protection as recognized method; • 19.9% report a sacred site near infrastructure	• *Popularly Acknowledged;* • *scale smaller than other methods*
Community forest/watershed management	CFM regulates catchment extraction	• 21.2% report community patrol/watch systems	• *Partially Acknowledged;* • *moderate uptake*
Rooftop and community rainwater harvesting	Bamboo/wood containers, gravity design, collective labour (*zhabto lemi*)	• 80.5% recognize community tanks; • 40.7% use harvesting pits for drought coping; • 9.1% household roof harvesting	• *Popularly Acknowledged;* • *community-scale dominant over household-scale*
Terracing, bunding, contouring	Reduces runoff, improves soil moisture, aids recharge	• 6.9% earthen bunds; • 26.0% small ponds	• *Popularly Acknowledged at modest,* • *supplementary scale*
Gravity-fed *chhuzhing* irrigation, rotational sharing	Turn-based allocation, WUA precursor, penalties for misuse	• 38.1% recall turn-based allocation; • 57.1% cite WUA as historical allocator;	• *Popularly Acknowledged*

ILK theme (literature)	Literature evidence	Survey / community-consultation corroboration	Status
		• 65.4% use community meetings for disputes	
Equity of customary irrigation rules	Framed as inherently equitable in literature	• Only 45.9% rate rules "mostly fair"; • 37.7% report unfairness to vulnerable groups	• *Nuanced;* • *survey reveals equity gap not captured in literature*
Chupon/water-manager institution	Locally appointed enforcer of seasonal rules	• Captured indirectly via Tshogpa (40.3%) and WUA (57.1%) as allocators	• *Popularly Acknowledged via community consultation;* • *live equivalent role recorded as "Chusub" in current WUA office-bearer structure (Chairperson/Secretary/ Treasurer/Chuchub)*
Gyen — rotational household responsibility for community-asset maintenance	Not documented	• Not captured by survey instrument	• *Newly documented via community consultation; ILK practice,* • *Not previously recorded*
Dedrik — customary adjustment of adjoining land boundaries to site community infrastructure	Not documented	• Not captured by survey instrument	• *Newly documented via community consultation; ILK governance practice,* • *Not previously recorded*
Sacred-site clearance for water infrastructure	Sacred sites impose customary restrictions on nearby land use	• 45.9% "don't know" if infrastructure affects a sacred site (Section 4.1)	• *Popularly Acknowledged and concretely resolved via community consultation;* • *Chizhi Gompa/Samtsang clearance case (Genye Gewog)*
Sub-Gewog WUA structure, financing and registration	Modern WUAs are the formal-governance evolution of indigenous canal management	• 57.1% cite WUA as historical allocator	• *Popularly Acknowledged and* • *detailed via community consultation;* • *chiwog-level WUAs with own bylaws, annual membership fees in dedicated bank accounts, mostly not registered under the Water Act (2011)/Water Regulation (2014); (registration incomplete in Genye and Dagala)*
Ecological/phenological forecasting (plants, birds, animals)	Detailed catalogue of bio-indicators for rainfall/season	• Not separately captured by current instrument	• *Data gap;* • *Recommend supplementary*

ILK theme (literature)	Literature evidence	Survey / community-consultation corroboration	Status
			indicator-mapping exercise
Seasonal crop-calendar and livelihood adaptation	Drought-tolerant crops, seasonal mobility, calendar shifts	• 35.1% crop rotation; 26.0% BBS-informed calendar adjustment	• *Popularly Acknowledged*
Traditional governance institutions (Tshogpa, elders)	Central to customary law and conflict mediation	• 52.4% Tshogpa; 41.6% elders; 65.4% community meetings	• *Popularly Acknowledged*
Intergenerational transmission	Oral transmission via elders/monastic institutions	• 68% perceive transfer as stable/improving, but • 17.7% report declining active practice	• *Conflicting signals* • *Requires qualitative reconciliation*

7. Cross-Cutting Analysis

A living, functioning ILK system: The household survey demonstrates that ILK for water management in the Thimphu rural project area is not a historical artefact but an actively practiced, hybrid system operating alongside - and blended with - modern water infrastructure and information sources. Belief in water-source taboos (76.6%), rain rituals (28.1%) and community-tank/turn-based allocation practices (80.5%/38.1%) show continuity with the literature's characterization of IK as "dynamic and adaptive," not static tradition.

Gender dimensions: Women report higher rates of belief in water-source taboos (77.4% vs 75.3%), rain-ritual practice (29.9% vs 25.8%) and reliance on elder-mediated conflict resolution (23.4% vs 11.8%), while men report marginally higher recognition of sacred-spring protection (23.7% vs 14.6%) and modern weather-information use (32.3% vs 21.2%). This suggests women are more engaged custodians of the spiritual/ritual dimension of ILK, while men have somewhat greater exposure to modern information channels - both dimensions should be reflected in consultation and capacity-building design.

Unresolved cultural-heritage risk - now partly resolved by field evidence. The 45.9% "don't know" response on whether planned infrastructure would affect a sacred/cultural site remains the single most safeguards-relevant survey finding at scale, but the July 2026 community consultations show that, on the ground, this uncertainty resolves quickly and concretely once communities are directly engaged: Communities are clearly aware of the specific clearances, exact clearance-holders, and even mitigation designs identified through structured consultations. This strengthens - rather than replaces - the recommendation for participatory screening.

Three-way triangulation strengthens the evidence base: Adding community consultation findings to the literature-and-survey pairing turns a two-source corroboration exercise into a three-source triangulation, which is materially stronger for two reasons:

i. it independently confirms the *chupon* institution under its live local title (*Chusub*) where the survey alone could not isolate it; and
ii. (ii) it surfaces genuinely new ILK practices — ***Gyen*** (rotational asset-maintenance labour) and ***Dedrik*** (customary land-boundary adjustment) which prior sources have had captured at all. This amplifies the relevance of *recording* (not only corroborate) indigenous knowledge and traditional practices related to field engagement, and that further consultation is likely to surface still more undocumented customary institutions and practices that may be relevant to water management.

*Uneven consultation participation by gender***:** Female participation in the July 2026 consultations varied sharply by Gewog - from 61% in Chang and 50% in Dagala down to 44% in Mewang and Kawang and just 34% in Ge-Nyen - against an overall average of 45%. This pattern of uneven engagement mirrors the survey's finding that women are more engaged custodians of the ritual/spiritual dimension of ILK but should not be assumed to translate into proportionate influence over technical/siting decisions, particularly in Gewogs where female turnout was lowest.

8. Implications for EbA in implementation

i. Anchor the catchment-protection/EbA component in existing ILK practice, formally recognizing and reinforcing - rather than replacing - the practices already observed by 45–49% of households: tree planting around water sources, no-cutting buffer zones, fencing/enclosure of springs, and community patrol systems.

ii. Formally document ILK - customary allocation rules, seasonal/ritual calendars, sacred-site locations, and (through a supplementary participatory exercise) the plant-phenology and animal/bird-behaviour indicators catalogued in the literature but not yet captured by the household instrument - as part of project M&E, safeguarding institutional memory against the observed 17.7% practice erosion.

iii. Retain and formalize community water tanks and turn-based ("taking turns by day" or by hour) allocation as the operating backbone of the new water scheme, given their dominant current recognition (80.5% / 38.1% respectively), while requiring the new WUA by-laws to explicitly correct the 37.7% "unfair" rating of legacy rules for poor households, women, tenants and people with disabilities.

iv. Formalize the advisory role of Tshogpas, elders and - where relevant - religious leaders within WUA governance structures, providing a structured, non-tokenistic channel for ILK to inform operational decisions (supported by 35.5% of households).

v. Respect and integrate rain/water rituals within project communication and safeguards messaging rather than treating them as superstition to be displaced - 57.6% of households already see this as compatible with modern safeguard measures.

vi. Prioritize capacity-building/training as the central ILK-sustainability support mechanism, since it is the most consistently requested form of support across all related survey questions (approximately 45% of respondents, alone or in combination with joint planning, documentation, leadership roles, M&E and awareness-raising).

vii. File ILK-related findings under ESS Principles 9 (Natural Habitats), 10 (Biodiversity) and 14 (Physical and Cultural Heritage), consistent with the project's ESS screening outcome that no community in the project area constitutes a "distinct" Indigenous People under UNDRIP/Principle 7, while still applying FPIC-equivalent, culturally sensitive consultation wherever sacred sites, taboos or customary resource rights may be affected.

viii. Resolve outstanding site-specific clearances identified through community consultation before siting works: Chizhi Gompa (monastic body), Samtsang village and WUA clearance in Genye Gewog; Druk Green Power Corporation (DGPC) clearance for the Khasadrapchu stream crossing that intersects an existing hydropower line, and for the new hydro alignment conflict at Jamina; and Road Safety and Transport Authority (RSTA) clearance for the highway and Jemina road crossings.

ix. Adopt community-proposed engineering mitigations directly: manage tail-end overflow near Chizhi Gompa via a piped outlet into the natural drain on the left bank of Chizhi Goenpa; design steep-slope pipe-stabilisation structures for the Genye alignment; and use proper Hume-pipe under-structures for road crossings such as the Zangleykha farm road, rather than at-grade crossings.

x. Formally recognize *Gyen* and *Dedrik* within new WUA operations-and-maintenance and land-siting procedures - *Gyen* as a legitimate rotational labour-contribution mechanism for asset upkeep, and *Dedrik* as a first-resort, community-trusted tool for resolving infrastructure-related land-boundary adjustments, documented transparently to prevent informal grievances (ESS Principle 15).

xi. Recognise the *Chuchub* role explicitly within formal WUA governance structures (alongside Chairperson, Secretary and Treasurer), confirming its function and scope of duties directly with WUAs, so that this living equivalent of the literature's *chupon* institution is built into - not bypassed by - the project's WUA-strengthening component (Component 3.1 of the project results framework.

xii. Build WUA technical capacity where consultations identified concrete gaps: materials-quality assurance, pipe-jointing/plumbing skills, equipment sourcing, and provision of basic maintenance equipment, with a WUA/community representative present alongside the project engineer during implementation for materials selection and final siting decisions.

xiii. Target outreach to raise female participation in Gewogs where consultation turnout skewed male - Ge-Nyen (34% female), Mewang (44%) and Kawang (44%) - to close the gap with higher-participation Gewogs such as Chang (61%) and Dagala (50%), consistent with ESS Principle 5 (Gender Equality and Women's Empowerment) and the survey's finding that women are disproportionate custodians of ILK's spiritual/ritual dimension.

xiv. Maintain infrastructure maps at the Gewog office, as requested by communities, to support long-term operations, maintenance and dispute-resolution continuity.

9. Conclusion

The evidence from the ILK literature review, the Thimphu rural household survey, and the July 2026 community consultations converges on a consistent picture: Bhutan's local ecological knowledge for water management - rooted in Buddhist ethos, sacred-landscape beliefs, and customary community governance - remains an actively practiced, adaptive system, not a legacy tradition. It already performs core EbA functions (watershed protection, drought-season water security, equitable-if-imperfect allocation, ecological forecasting) at meaningful scale across the project's Gewogs. The household survey both popularly acknowledge the literature's major claims (sacred-site taboos, community rainwater harvesting, rotational irrigation, Tshogpa-centred governance) and supplements them with quantified evidence of practice, gender differentiation, equity gaps in customary rules such as *chupon/Chusub* water-management role under its live local title, and, most notably, recording two entirely new customary institutions, *Gyen* and *Dedrik*, that prior sources have not had captured. Together, these triangulated evidence streams provide a robust basis for designing an EbA and water-security intervention that builds on - and strengthens - existing indigenous knowledge and institutions rather than displacing them.

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Report on
Local Community Stakeholder Consultations
For
Securing Water & Enhancing Climate Resilience in Thimphu (Rural) District, Bhutan



Bhutan Ecological Society

February 2026

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1.Introduction

1.1 Project Background

The Bhutan Trust Fund for Environmental Conservation (BTF), as the National Implementing Entity (NIE) of the Adaptation Fund (AF) and the Department of Macro-fiscal and Development Finance (DMDF) as the Designated Authority, has submitted a project concept note to the Adaptation Fund for accessing the funding through the Locally Led Adaptation Funding Window. The concept proposal: *"Securing Water & Enhancing Climate Resilience in Thimphu (Rural) District, Bhutan"* has been approved by the Adaptation Fund in August 2025.

The overall objective of the project is to enhance the adaptive capacities of communities to impacts of climate change by building resilience and implementation of ecosystem-based adaptation measures in Thimphu district.

The specific objectives are to:

1. **Increase ecosystem resilience in response to climate change and variability-induced stress**: Implement ecosystem-based adaptation interventions to ensure natural capacity for water infiltration, recharge and water buffering through restoration, rehabilitation, and protection of degraded catchment areas/ watersheds, thereby improving water retention, groundwater recharge, and overall water availability.
2. **Enhance Sustainable Water Resource Management**: Improve access to clean and safe drinking water and resilient irrigation systems through the development of community-based water supplies, strengthen Water User Associations (WUAs) with 30% women participation and promote sustainable water resource management.

3. **Strengthen the adaptive capacities of local communities and organizations**: Enhance the capacities of local communities and organizations in the planning, governance and implementation of water adaptive mechanisms to reduce vulnerability against climate change with special

consideration to women (at least 30% women participation in all capacity building activities).

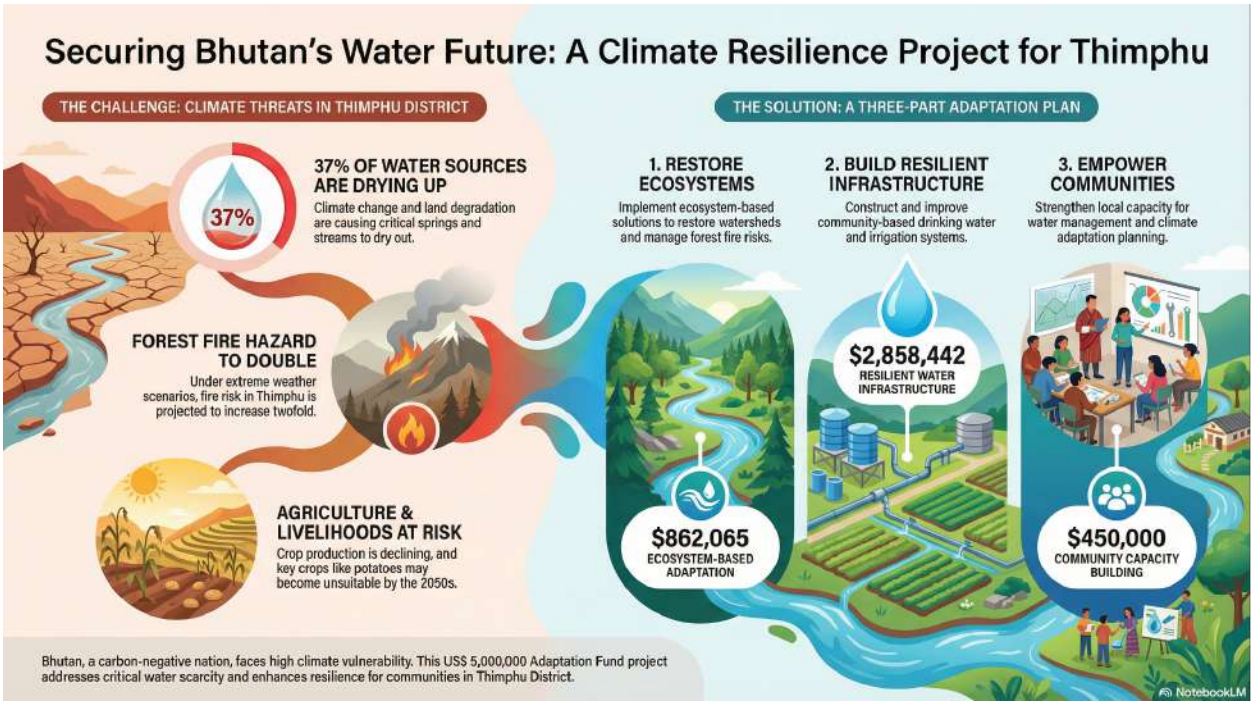


Figure 1 Project Conceptual Framework: Raison d'etre (Illustration by NotebookLM)

The project aims to enhance water security, promote climate-resilient livelihoods, and strengthen the resilience of rural communities in five Gewogs (Chang, Kawang, Mewang, Dagala and Genyen) of Thimphu District (Figure 1).

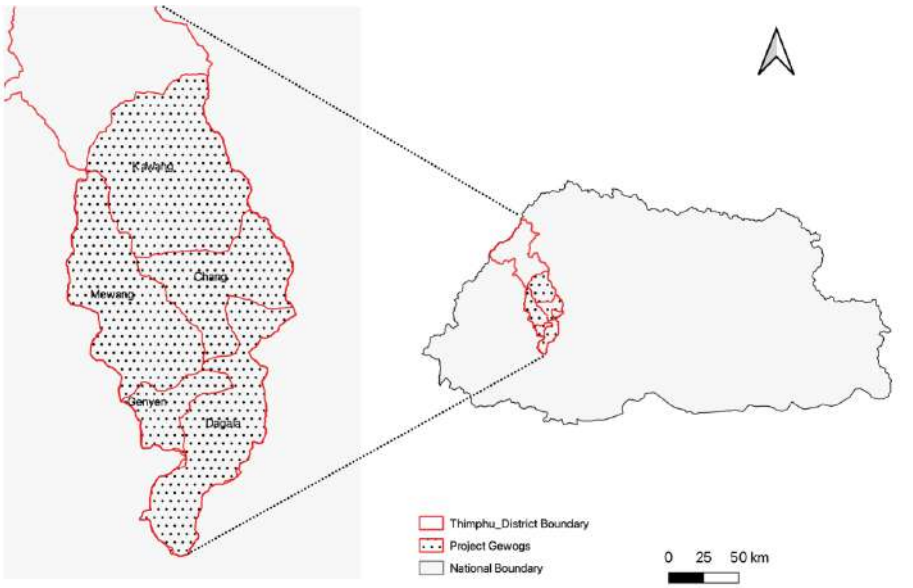


Figure 2 Map showing the location of the proposed project sites under Thimphu District

1.2 Purpose of Consultations

The main objective of the community consultations were to :

- **Present and clarify the LLA project framework:**
  Introduce the LLA project concept, including its objectives, scope, and guiding principles, and explain the fully developed project formulation process to ensure clear understanding among stakeholders.
- **Validate proposed adaptation interventions:**
  Review and confirm the relevance, feasibility, and community alignment of the key adaptation activities identified in the initial project concept.
- **Assess additional vulnerabilities and capacity gaps:**
  Identify emerging climate risks, livelihood challenges, and priority needs related to Climate-Smart Agriculture (CSA) and Sustainable Land Management (SLM), based on community inputs and field observations.

- **Conduct site familiarization and stakeholder consultations:** Undertake field visits to the proposed project sites to engage directly with communities, verify ground realities, and better understand local needs, institutional capacity, and implementation challenges.

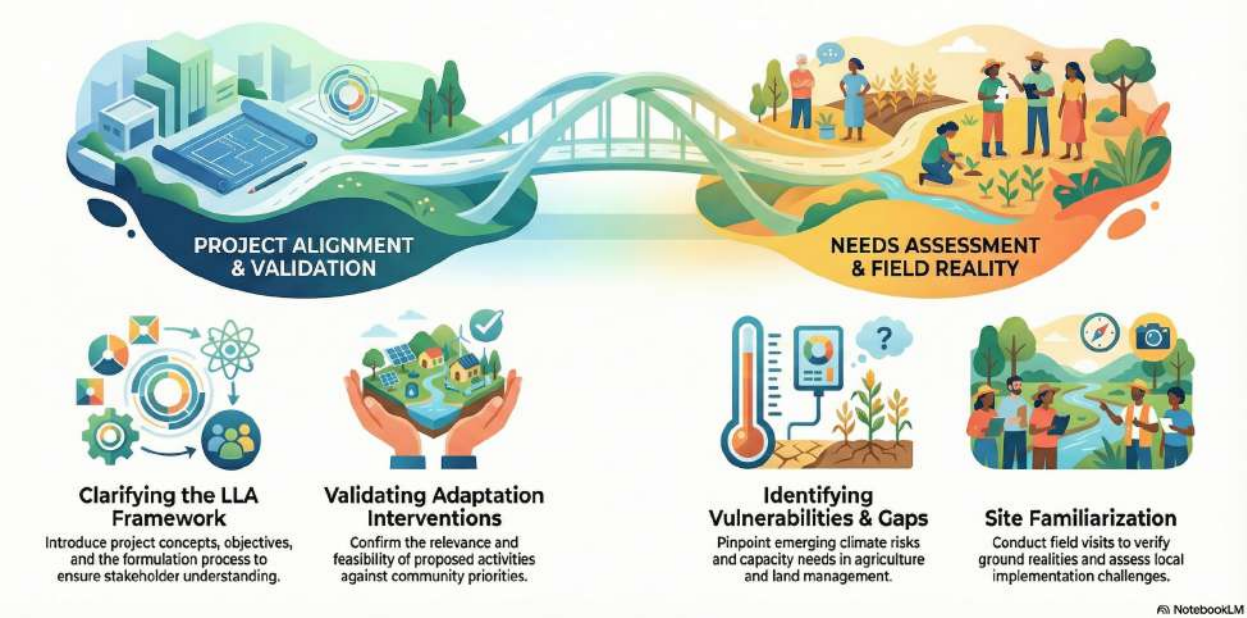


Figure 3 Illustration of the Objectives of Consultation (Illustration by NotebookLM)

1.3 Report Objectives and Scope

- The report covers the insights from the community consultation with the Local Government officials and the project beneficiaries from the Chang, Kawang, Mewang, Dagala and Genyen gewogs under Thimphu dzongkhag.
- The report also includes the results of the preliminary survey carried out by the engineers from the DOID, Thimphu Dzongkhag and the respective Gewog Engineers for the proposed drinking water and irrigation schemes under the project and validated during the detailed community consultations.
- The report does not cover the detailed gender analysis of the project beneficiaries, Environment and Social safeguards.

2. Approach

2.1 Consultation Design

For the consultations, a detailed stakeholder mapping was carried out.

Stakeholder categories consisted of local community leaders, farmers, women/youth groups, private individuals, forestry officials, agriculture extension officers, health workers, schools and other CSO and relevant institutions within the gewog were identified).

Purposive sampling was used to identify the stakeholders for the detailed consultations. Only the project beneficiaries from the respective Chiwogs, local government leaders, existing service providers, Schools, Agriculture extension officers, Forestry Officials, Health officials and relevant officials from the Thimphu Dzongkhag Administration, Dzongkhag Engineering Sector, Department of Infrastructure Development, particularly Water and Sanitation Division and Irrigation Division, Department of Water, DMDF , BTFEC and BES were invited to the consultative meetings at respective gewog centers.

2.2 Methods and Tools

Participatory workshop and Focus group discussions (FGDs) were the main methods used for the community consultations. These were conducted in Genyen, Kawang, Dagala, Chang and Mewang Gewogs from **29th December 2025 till 9th January 2026.**

The validation exercise focused on assessing the relevance, feasibility, and community alignment of the proposed project interventions. Key questions covered

climate vulnerabilities (including water scarcity, extreme weather, and land degradation), irrigation and drinking water source confirmation and existing management systems, institutional arrangements such as the status and functionality of Water User Associations (WUAs), gender inclusion, and support for vulnerable households. The process also examined infrastructure needs (e.g., water storage, pipelines, drainage), potential environmental and social risks, and the adequacy of current monitoring and reporting mechanisms. In addition, discussions explored capacity gaps related to Climate-Smart Agriculture (CSA), Sustainable Land Management (SLM), and institutional strengthening.

Microsoft Excel was used to compile the data and visualize the findings from the detailed community consultations.

3. Consultation Process and Participation

3.1 Implementation Overview

Between 30 December 2025 and 9 January 2026, a series of structured community consultations were carried out across five gewogs to support planning and implementation of integrated water-supply and irrigation projects. The schedule ensured systematic engagement with local communities, gewog administrations, and sectoral agencies. Each consultation was held at an accessible public venue, primarily Gewog Yargay Tshochung (GYT) Halls and Khasadrapchu MSS, enabling broad participation.

The consultation began from Genekha Gewog on 30-31st December 2025, focusing on the Integrated Irrigation and Water Supply Project for Geney, Zanglay, Chigen, and Tshocheykha chiwogs. This session expected participation from 30 community

members and 11 officials, and was followed by a field visit on 31 December 2025 to verify site conditions and gather on-ground insights.

On 1st January 2026, the team convened in Kawang Gewog to discuss the Construction of Changtagang Water Supply and other community needs. This consultation anticipated 70 public participants and 10 officials, alongside engagement from key institutions such as schools, BHU, and agriculture–livestock–forestry extension services.

The next consultation took place in Dagala Gewog on 5th January 2026, covering the Construction of Helela Water Supply at Chamgang and other community needs.

On 8th January 2026, the consultation was carried out in Maedwang Gewog, held at Khasadrapchu Middle Secondary School Auditorium. Discussions centered on the Woluna Water Supply Project and maintenance of irrigation channels at Danglo and Lower Woluna, as well as water supply for Khasadrapchu-Khasakha and the irrigation scheme for Lamdru, Dalulum, and Dalukha. Expectations included 160 public participants and 12 officials, alongside representatives from schools, BHU, and extension offices.

The consultation meetings concluded in Chang Gewog on 9th January 2026 with discussions on the Rama Water Supply Project and rehabilitation of the Hongtsho Toed Maed Irrigation system. This session anticipated 60 community members and 10 officials, again involving cross-sectoral stakeholders such as schools, BHU, and extension services. The detail schedule is provided in Table 1 below.

Table 1 Consultation Schedule

Sl. No.	Gewog	Date	Venue	Expected Participants	Other Stakeholders
1	Genyen	30-31.12.2025	GYT Hall	Public: 30 Officials: 11	Schools, BHU, Agriculture–Livestock & Forestry Extension Services
2	Kawang	01.01.2026	GYT Hall	Public: 70 Officials: 10	Schools, BHU, Agriculture–Livestock & Forestry Extension Services
3	Dagala	05.01.2026	GYT Hall	Public: 164 Officials: 11	Schools, Agriculture–Livestock & Forestry Extension Services
4	Maedwang	08.01.2026	Khasadrapchu MSS	Public: 160 Officials: 12	Schools, BHU, Agriculture–Livestock & Forestry Extension Services
5	Chang	09.01.2026	GYT Hall	Public: 60 Officials: 10	Schools, BHU, Agriculture–Livestock & Forestry Extension Services

3.2 Participant Profiles

Genyen Gewog

Geney Gewog saw a total of **93 partcipants** during the consultative meeting, reflecting a diverse mix of farmers, local leaders, and technical personnel, demonstrating broad community and institutional engagement. A total of 93 participants consisting of 48 men and 45 women, showing near gender parity in overall attendance. The majority of participants were farmers, with a balanced gender distribution (32 women and 31 men), indicating strong representation from Genekha community. Beyond farming, the group included individuals serving in local governance and technical roles, such as Gup, Mangmi, Tshogpa, Agricultural Officer, Planning Officers (DMDF/MoF), Engineers,, Senior GAO, Surveyor, Technicians, and Institutions(BES,BTFEC,MOIT).



Figure 5 Consultation Meeting Participants in Genyen Gewog

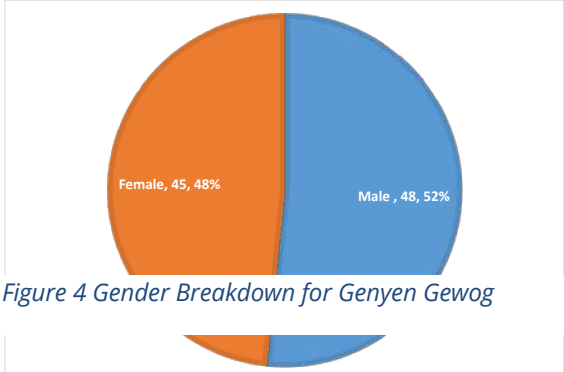


Figure 4 Gender Breakdown for Genyen Gewog

Kawang Gewog

Kawang Gewog garnered strong and diverse participation, with a total of **109** individuals for the consultative meeting. This high turnout reflects the community's strong interest in and ownership of local climate-resilience planning.



Figure 6 Community Consultation Participants at Kawang Gewog

Participation was notably gender-balanced, with **54 women** and **55 men**, ensuring equitable representation of perspectives in decision-making processes. Women included community members and as representatives of sectoral institutions.

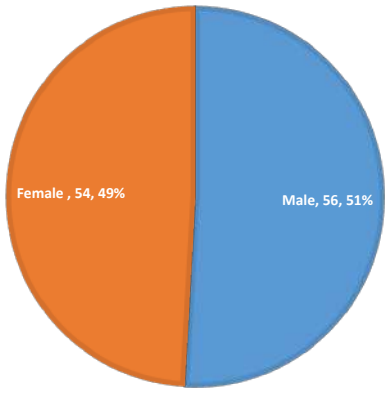


Figure 7 Gender breakdown for Kawang Gewog

The consultation brought together participants from across Kawang Gewog, with strong representation from Changdagang, supplemented by participation from Gapkhang, Dazhi, Gasabarma, and individuals associated with local offices and institutions. This mix of local residents, gewog leadership, and national-level technical personnel (including engineers, BES officials, and representatives from MoIT, MoF, and BTF) created a well-rounded forum for discussing water security challenges and adaptation priorities.

Overall, the consultation provided an inclusive and representative platform for gathering local perpectives, validating community priorities, and strengthening collaborative planning between communities and government agencies.

Dagala Gewog

Dagala saw a total of **140 members** from ***Chamgang Toed*** and ***Chamgang Maed*** participating in the consultative meeting. The group comprised of **74 women (53%)** and **66 men (47%)**, indicating strong female representation.



Figure 8 Community Consultation Participants' in Dagala Gewog

Participants ranged from local residents to individuals holding formal roles within the gewog and dzongkhag administration and officials from the Ministries, and CSOs. Overall, the participant profile shows a balanced gender mix, strong female engagement across technical fields, and broad community involvement—highlighting an inclusive environment while also pointing to opportunities for strengthening women's representation in higher-level decision-making roles.

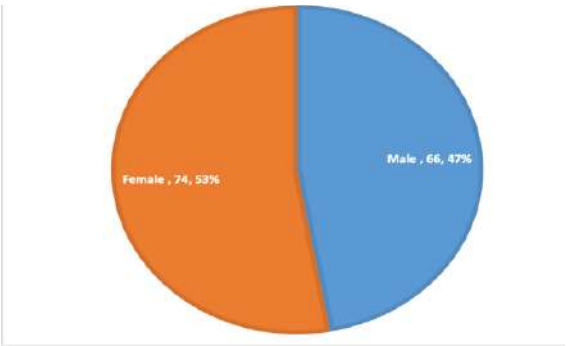


Figure 9 Gender breakdown for Dagala

Mewang Gewog

The community consultation conducted in Mewang Gewog saw an exceptionally strong turnout, reflecting both high community ownership and the relevance of the water- and climate-resilience agenda to local households. A total of **203** individuals participated, corresponding to approximately **193** community representatives.



Figure 10 Participants for Consultation in Mewang Gewog

From the total, **48%** were women and **52%** were men, demonstrating that project outreach has effectively engaged both women and men in shaping local climate-resilience actions. The consultation also saw a diverse mix of participant types, ensuring both representativeness and technical depth. The majority—175 individuals—were community residents, almost evenly split between women (86) and men (89). Alongside them, 18 officials and agency representatives participated, including gewog leaders, technical staff,

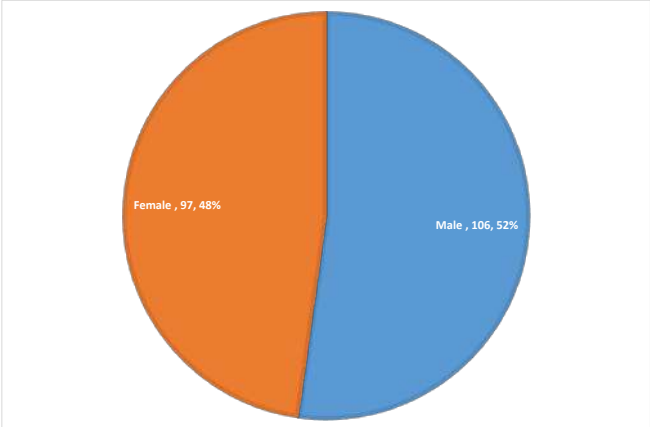


Figure 11Gender Breakdown for Mewang Gewog

engineers, MoIT representatives, BTF personnel, and BES staff; among these, 7 were women and 11 were men.

Geographically, the consultation achieved wide coverage across the gewog. Participation was strongest from ***Khasakha (81)*** and ***Wolluna (38),*** with meaningful representation from **Lamdru, Sigay, Khasadrapchu and Tshaphu.**This diverse representation ensured that the perspectives considered for project planning account for communities with varying levels of water access, topographic challenges, and vulnerability profiles. Overall, the consultation demonstrates high community engagement, strong gender inclusion, and effective mobilization across villages and administrative units to deliver gender-responsive, participatory, and sustainable climate-resilience interventions in Mewang Gewog

Chang Gewog

A total of **126 participants,** representing a broad cross-section of the local community, civil servants, project team members participated in the consultative meeting. More than 60% participants were from **Hongtsho chewog**, followed by 22 % from **Rama** with some incomplete entries.



Figure 12 Community Consultation Participants at Chang Gewog

The participant mix was predominantly community-based, with farmers forming the largest clearly identified group, alongside local business owners, caretakers, elected representatives, teachers, interns, and civil/technical officials. A key feature of the turnout was its balanced gender composition, with **59 males** and **67 females**, indicating a strong female engagement—particularly among farmers and community members—while men were more represented in technical, civil service, and elected roles.

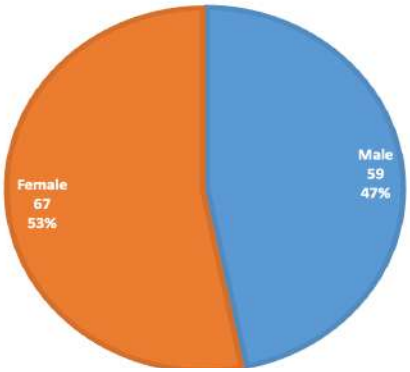


Figure 13 Gender Breakdown for Chang Gewog

4. Validation of Adaptation Priorities

The detailed community consultations confirmed priority adaptation needs, identified areas requiring technical and organizational support, and ensured that proposed interventions reflect community priorities and local conditions.

4.1 Genyen Gewog:

Genekha Gewog is one of the gewogs under Thimphu Dzongkhag, located to the south of Thimphu city. It is characterized by lush forests, fertile valleys, and traditional villages nestled along gentle hillsides. The gewog sits at altitudes roughly between 2,000 and 3,000 meters, making it well-suited for agriculture and horticulture. Genekha is also known locally as the “Mushroom Village” due to its abundance of wild mushrooms, especially the prized matsutake mushroom, which has become an important source of income for local farmers. The people of

Genekha Gewog engage mainly in farming, livestock rearing, and gathering forest products. The area retains strong cultural traditions, marked by annual festivals and community rituals. Its scenic landscape, combined with the nearby trekking routes like the Dagala Thousand Lakes Trek, has also brought modest eco-tourism interest, helping to support livelihoods while preserving its natural environment[1].

The proposed integrated water supply and irrigation scheme for Geney, Zanglay/Zanglaykha, Chigen, and Tshochaykha is technically feasible and has community support. Validation exercises indicate source water availability, no competing users, and no major clearance issues anticipated at this stage. Communities have committed labor for surveys and clearances. A detailed survey is required to confirm the indicative ~15 km transmission alignment and finalize hydraulic design parameters.

[1] https://thimphu.gov.bt/genekha-gewog/



Figure 14 Dagala Range showing Gangritueshay Source for Genyen

4.1.1 Ganritueshey- Genekha Integrated Water Supply Scheme

Source: Gangritueshey stream; availability confirmed in stakeholder validations.

Clearances and Social Risk: No significant disputes or clearance barriers are anticipated based on current information.

Community Contribution: Local workforce committed for surveys and required clearances.

Design Note: Approx. 15 km trunk alignment to be verified during detailed survey and design.

Beneficiaries and Institutions

Zanglaykha: ~35 households; 219 people (130 women, 89 men); Primary School, RNR and BHU noted.

Geney settlements (e.g., Genekha, Gabelo, Kazhibu, Thangzhi, Tazhi, Mangi Lhakhang, ECCD, Lhaksam Community): ≥52 households; 319 people; PWD entries recorded.

Tshochaykha: Current drinking and irrigation supplies are adequate but declining; sources are drying and not sufficient for expansion.

Institutional demand: ~60 students at Geney Primary School add to potable water needs.



Figure 15 Open Reservoir for irrigation at Genyen

4.1.2 Community-Identified Needs and Risks :

Needs: Reliable irrigation water; climate-smart agriculture support; soil fertility improvement using local manures; farmer training; improved seeds; affordable finance for small machineries.

Risks: Landslide-prone segments, potential pipe-burst impacts, and farmland crossings. Mitigation includes gabions/retaining walls, targeted tree planting, and negotiated rights-of-way.



Figure 16 Open Reservoir for irrigation at Zanglaykha, Genyen

4.1.3 WUA and Governance Status

Geney: WUA exists but is non-functional.

Zanglaykha: Irrigation WUAs exist but are not registered; current contributions ~Nu. 100/HH/year; call for greater women's participation. No drinking-water WUA.

Tshochaykha: No WUA; rotational user management in practice. Community requests WUA formation and an O&M pool fund.

4.1.4 Design and Implementation

- **Hydraulic design**: Confirm route and profiles during the detailed survey by engineers; plan pressure zoning, break-pressure tanks (BPTs), air-release valves (ARVs), anchor blocks, and energy dissipation.
- **Seasonality and storage**: Size storage and distribution to crop calendars and peak irrigation demand; provide sprinkler-ready outlets.
- **Route safety**: Stabilize slopes and secure right-of-way where the line crosses farmlands or vulnerable terrain.

4.1.5 Governance & O&M

- Establish/activate/register WUAs per chiwog: establish in Tshochaykha; register irrigation WUAs in Zanglaykha; functionalize Geney's WUA.
- Standardize bylaws, member rolls, user charges (building on ~Nu. 100/HH/year), banking, and internal audit; set women's representation targets in executive roles.
- Deliver O&M training (basic plumbing, record-keeping) and provide minimal spare parts/toolkits at gewog level.

4.1.6 M&E and Reporting

- Form a monthly multi-tier M&E committee (chiwog–gewog–dzongkhag–contractor) and adopt simple logbooks for uptime, intake flows, reservoir levels, NRW, and repairs.

4.1.7 Watershed & EBA/SLM

- Implement tree planting and gabion/retaining structures on vulnerable slopes; restore soil fertility using local manures; train farmers in CSA and judicious fertilizer use.

4.1.8 Equity & Social Protection

- Prioritize connections and targeted support for vulnerable households identified in Tshochaykha (e.g., tariff relief, storage tanks).

4.1.9 Recommendations:

- Confirm alignment and finalize hydraulic design with BPTs, ARVs, and anchor blocks.
- Complete GPS/topographic survey to verify the ~15 km alignment, intake locations, and hydraulics.
- Map and mitigate route risks (landslides, farmland crossings) with gabions/retaining works and right-of-way agreements.
- Size storage and distribution to seasonal irrigation demand; plan CSA/sprinkler compatibility.
- Operationalize WUAs with standard bylaws, transparent fee policy, and women's leadership targets.
- Create a WUA-managed O&M fund with dzongkhag top-ups linked to M&E compliance.
- Plan storage and distribution to seasonal crop water needs; integrate sprinkler-ready outlets.
- Mitigate route risks via engineered protections and negotiated ROW; schedule works to fit community calendars.

- Target support to vulnerable households during connection and tariff planning.

Table 2 Proposed Water Supply Scheme and other characteristics for Genyen Gewog

Descriptions	***Remarks/Status***
Main Activity	Construction of Integrated Water Supply scheme for Tshochaykha, Zanglaykha and Genyen
Proposed Source	Gangritueshay, Dagala
Source type	Stream
Distance from source (km)	10
Water availability at source	Yes
Any dispute for tapping water	No
Difficulty in obtaining Clearance (Forestry/Env./Social)	No
Community support	Workforce contribution in survey, clearances
Existing/Functional WUA	Yes
Chewogs to be served	Tshochaykha, Zanglaykha, Genyen
Population – HHs/Institutions	
Population – Male	
Population – Female	
Population – PWD	0
Dryland (acres)	Tshochaykha(87); Zanglaykha (89);
Wetland (acres)	0
Orchard(acres)	Zanglaykha (0.47)

4.2 Kawang Gewog

Kawang Gewog, one of the five gewogs under Thimphu Dzongkhag, lies just north of Thimphu Thromde and forms a scenic transition zone between the capital city and the higher Himalayan landscape. Stretching across forested mountains and traditional rural settlements, the gewog offers a striking contrast to the urban environment of Thimphu.

Strategically positioned, Kawang shares its southern boundary with Thimphu Thromde and extends northward toward Naro Gewog. Its villages reflect a blend of semi-urban and rural lifestyles, and the area plays a vital role as a green buffer that helps maintain the ecological balance of the Thimphu Valley.

The gewog is also recognized for its historic and cultural sites, distinctive traditional architecture, and vibrant festivals such as Lochoe and Lomba. Agriculture, livestock rearing, and emerging small-scale tourism form the backbone of the local economy, sustaining the livelihoods of its residents while preserving the gewog's rich cultural and natural heritage[2].

4.2.1 Changtagang Water Supply Scheme

For Kawang gewog the priority from the community is the Nimshong-Changtagang water supply project serving Changtagang and Gasabarma. The validation exercise consolidated the scheme characteristics, user institutions, social organization (WUA), community needs, risks, monitoring systems, and an actionable recomendation.

Changtagang comprises approximately 44 households, many of which maintain additional agricultural landholdings. The settlement is relatively small but socially cohesive, with households demonstrating high willingness to participate in

[2] https://thimphu.gov.bt/kawang-gewog/

community-led processes such as surveys and clearance procedures. Labour contributions were notable during initial planning for the Changtagang water supply scheme.

Gasabarma is a larger settlement with more than 45 households, including five elderly households. Despite a comparatively stronger WUA structure, labour shortages pose challenges for routine maintenance activities. The settlement is affected by both environmental pressures—such as upstream catchment flooding and forest fire risk—and infrastructural gaps, particularly in drainage.

Table 3 Changtagang Water Supply Scheme Profile

Descriptions	***Remarks/Status***
Main Activity	Construction of Changtagang Water supply
Proposed Source	Nimashong
Source type	Stream
Distance from source (km)	~10
Water availability at source	Yes
Any dispute for tapping water	No
Difficulty in obtaining Clearance (Forestry/Env./Social)	No
Community support	Workforce contribution in survey, clearances
Existing/Functional WUA	Yes (WUA exists (31 members, 2 women) and operates on a rotational basis.
Chewogs to be served	Changtagang

Population – HHs/Institutions[3]	512 / 112 households (89 HH registered, 23 tenants) Changtagang: ~44 houses (several with associated land parcels); WUA exists but no women members at present. Gasabarma: 45+ households, including 5 older-person households;
Population – Male	259
Population – Female	253
Population – PWD	0



Figure 17 Begana Stream originating from Nimashong Source

[3] Kawang Gewog Administration, 2026

4.2.2 Social Organization and WUA Governance

WUA Status and Functioning

- **Lower Changtagang WUA:** Registered, 5 members, 0 women; bylaws exist but the association requests capacity support on operations & maintenance (O&M), minor maintenance seed fund, caretaker tools, and scheme management. A noted barrier is that women are not willing to participate presently.

- **Gasabarma WUA:** 31 members (chair + 2 executives), 2 women; rotational oversight. Key gaps include labour shortfalls, O&M budget constraints, and a need for technical design/materials to address drainage bottlenecks (pipes and layout).

4.2.3 Community Priorities and Needs

Lower Changtagang – Key Issues and Needs

- **Challenges**: Human–wildlife conflict (HWC), water scarcity, inadequate drainage, and marshy ground.
- **Requested Interventions**: Earthen drains/dams, storm-water storage, and riverbank protection.
- **Support Sought**: Seeds, tools, and agricultural equipment.

Gasabarma – Key Issues and Needs

- **Challenges**: Private-land marshes, forest fire risk (blue pine), road/drain flooding from the upstream catchment, tank overflow in summer, and a fragmented community drainage network.
- **Requested Interventions**: Integrated drainage & natural outfalls, pipes, and trail upgrades; a community idea for eco-park/eco-trail to generate co-benefits.
- **Support Sought**: Maintenance budget and labour support.

Implication: Across both sites, drainage is the systemic pinch point linking flooding, waterlogging, road damage, and O&M burden—a priority to be included in the project.

4.2.4 Risks and Safeguards

Reported / Perceived Risks

- **Lower Changtagang:** Community perceives "no risk" because the system is for drinking water, suggesting low risk awareness
- **Gasabarma:** High flow & erosion, blue-pine forest fire risk, HWC (deer), and no fencing—all highlighted by residents.

Risk Management Priorities

- Shift from "no risk" to proactive risk management via a Water Safety Plan (WSP): source protection, surge/overflow controls, sanitary inspections, and chlorination SOPs.
- Integrate drainage design (hydraulic sizing, natural outfalls, and attenuation) to curb erosion and road/field damages.
- HWC mitigation (fencing where feasible, buffers, seasonal guarding) and blue-pine fire risk reduction (fire lines, fuel management, awareness).

4.2.5 Monitoring, Reporting, and Learning (M&E)

- Lower Changtagang: Ad hoc social-media groups escalate water issues; needs record-keeping and a formal WSP.
- Gasabarma: Not documented—indicates a need to establish a basic community M&E systems.

4.2.6 . Gender and Inclusion

- Lower Changtagang WUA: 0 women; stated reluctance to participate—targeted mentorship and flexible roles (e.g., treasurer or hygiene/WSP focal points) can lower barriers.
- Gasabarma WUA: 2 women in a 31-member association—scope to increase women's representation and influence (quorum rules, role rotation, targeted leadership training).

4.2.7 Actionable Recommedations

Enhancing Drainage system in Changtagang

- Design and construct an integrated drainage network from household lanes to village outfalls, with natural drains and storm-water attenuation. (0–6 months design; 6–12 months construction)
- Size crossings/culverts and include minor protection works to reduce erosion and protect roads and fields.

WUA Governance, O&M and Inclusion

- Refresh WUA bylaws in both locations, adopting a ≥30% women target for executive roles; formalize fee/seed-fund rules and AGM schedules.
- Equip caretakers with basic tools; deliver hands-on plumbing/O&M training; define roles and simple job aids/SOPs.
- Set up a ring-fenced seed maintenance fund and open/confirm WUA bank accounts**.**

Water Safety Planning (WSP)

- Implement a WSP covering source protection, storage overflow control, periodic tank cleaning, and residual chlorine/turbidity checks.
- Introduce a community M&E dashboard (monthly), with: (i) incidents logged, (ii) repairs & costs, (iii) water-quality checks, and (iv) WUA meeting proceedings.

Human–Wildlife Conflict (HWC) and Fire Risk

- Prioritize deer and other wildlife damage hotspots for community fencing or buffer plantings.
- Strengthen Community based forest fire management groups
- Establish fire lines and early-season fuel management in blue-pine belts, conduct community awareness drills before the dry season.

5. Community Monitoring & Reporting

- Launch a simple community dashboard for reporting monthly incidents, repairs, costs, and water-quality checks; adopt uniform templates across communities

- Leverage existing social-media groups in Lower Changtagang and formalize escalation to Gewog focal points; establish routine in Gasabarma.

4.3 Dagala Gewog

Dagala Gewog is one of the gewogs under Thimphu Dzongkhag, located to the southwest of Thimphu city. It is known for its stunning alpine landscapes, scattered highland settlements, and the famous Dagala Thousand Lakes, a pristine area dotted with beautiful glacial lakes. The gewog's elevation ranges from around 3,000 to over 4,000 meters, with rugged mountains, rich pastures, and lush forests forming its natural environment. The people of Dagala Gewog traditionally rely on yak and cattle herding, small-scale agriculture, and seasonal collection of medicinal plants. The gewog is also part of popular trekking routes like the Dagala Thousand Lakes Trek, attracting trekkers drawn to its untouched scenery and serene lakes. Despite its proximity to Thimphu, Dagala retains a peaceful highland atmosphere, and a lifestyle deeply connected to its natural surroundings[4].

The Chamgang Toed and Chamgang Maed, under Dagala gewog indicated that water availability for irrigation remains the main concern, particularly due to changing rainfall patterns and increasing demand. While existing water sources currently support agricultural activities, there are concerns about long-term reliability and the need for improved storage and distribution systems. Community members practiced routine maintenance of irrigation channels, but institutional arrangements require strengthening, including clearer roles, formal registration of water user groups, and improved coordination. Land management challenges are emerging, including soil erosion during the monsoon and declining soil fertility in some areas, highlighting the need for sustainable land management practices. No major social conflicts were reported, and community participation remains strong. However, there is a clear

[4] https://thimphu.gov.bt/dagala-gewog

need for technical support, capacity building in water management and climate-smart agriculture, and improved monitoring to ensure long-term sustainability.

4.3.1 Helela – Chamgang Water Supply Scheme

The ***Helela – Chamgang Water Supply Project*** is one of the key activities proposed under the project and proposes to serve both Chamgang Toed and Chamgang Mae using perennial stream sources at *Helela (Chu Sap and Lum Jangsa*). Field validation indicates water availability at the sources, no competing users, and no anticipated disputes or clearance difficulties; communities committed workforce support during survey and clearances. Chamgang Toed lists 160 beneficiaries and Chamgang Maed reported 62 water users and approximately ~150 HH and key institution, and source-to-delivery distances vary (8.9 km).



Figure 18 Landscape of Chamgang with Helela



Figure 19 Field Visit to existing Water Distribution Tank at Chamgang

Table 4 Helela-Chamgang Water Supply project profile

Aspects	***Characteristics***	***Remarks***
Source	Helela water supply; Chu Sap & Lum Jangsa; mentions Leshena & Jim Kosa Jab (stream)	Common scheme serving both chiwogs
Distance from source	8–9 km	Confirm via GPS and topo survey
Water availability	Yes (implied; no concern noted)	Hydrometric checks at design
Other user & Disputes	No	Low external risk

Clearance (Forests, Env. & Community)	No	
Community contribution	Workforce for survey & clearances	Labour mobilization available
WUA status	Registered WUA; bylaws; ≈35% women; payment system; Chair/Treasurer/Member-Sec	Harmonize SOPs & inclusion targets
Beneficiaries & institutions	62 water users; references ~150 HH; institutions: BHU, ECCD, Gewog office, RNR office; M=22, F=40, PWD=3	Standardize units; verify totals
Population[5]	Chamgang Toed- 452 Chamgang Maed- 1546	
Male	1332	
Female	666	

4.3.2 Community Needs & EBA/SLM

Chamgang Toed: Primary concern is reliable drinking water; basic O&M support and standards training requested.

Chamgang Mae: Erosion and flashflood control requested (gabion walls, watershed plantation).

4.3.3 Risks & Mitigation

[5] Dagala Gewog Administration 2017

- Chamgang Toed reports no forest-fire incidences and undertakes suppression activities; overall risk awareness appears limited to immediate hazards.
- For Chamgang Mae, community members implied erosion/flashflood hotspots near intakes and along the alignment which warrant protection works, and site-specific slope stabilization where necessary.

4.3.4 Institutions, Capacity & Inclusion

- WUAs are active in both chiwogs. Chamgang Toed seeks O&M training, seed maintenance funding, gender inclusion, and PES scoping with Thimphu Thromde.
- Chamgang Mae's WUA is registered with bylaws and a payment system, and reports ≈35% women participation; members request basic plumbing training, bylaw support, and account formalization. A common capacity program should standardize SOPs and set explicit inclusion targets (e.g., ≥30% women in executive roles).

4.3.5. Community Monitoring & Standards

- Chamgang Toed uses Tshogpa-led monitoring and requests training on construction and water-supply standards; Installation of CCTV at source is suggested.
- Chamgang Mae relies on caretaker/chairman for twice-monthly cleaning and monitoring and asks for capacity development and Water Act familiarization. A unified light M&E routine (shared templates and logbooks) will support consistency across both chiwogs.

4.3.6 Actionable Recommendations

- **Survey & Design**: confirm intakes (Chu Sap, Lum Jangsa) and final alignment; reconcile distance discrepancy; profile headloss and structural supports during the detailed assessments.
- **Watershed/DRR Measures**: design gabions, riverbank protection, and watershed plantation at vulnerable reaches during the detailed assessment by the engineering team.
- **WUA Strengthening**: deliver basic O&M/plumbing training; refresh bylaws and payment systems; operationalize bank accounts; set women's representation target (≥30–35%).
- **M&E & Compliance**: Strengthen community M&E systems; institute twice-monthly inspections with simple logbooks; train on construction and water-supply standards and advocacy on Water Act; assess feasibility of CCTV at source.
- **PES Scoping**: initiate a concept note with Thimphu Thromde for source protection co-financing and measurable performance indicators.
- Include prioritized protection and stabilization measures at identified hotspots along the alignment during the implementation phase.
- **Institutionalize O&M**: caretaker tools, annual workplan, and seed maintenance fund; adopt unified SOPs across both chiwogs.
- **Operationalize Water Safety Plan (WSP):** sanitary inspections, chlorine/turbidity checks, tank cleaning schedule, and incident reporting.
- Formalize and monitor gender inclusion targets through AGM minutes and WUA executive composition.

4.4 Mewang Gewog:

Mewang Gewog lies close to Thimphu Thromde, bordering it on the northern side and stretching towards the Wangdue Phodrang Dzongkhag in the south. The gewog consists of several villages nestled along the Wangchhu river valley, where agriculture remains the main source of livelihood, especially paddy cultivation and vegetable farming. Due to its strategic location, parts of Mewang Gewog have seen gradual development and semi-urbanization. Despite this, the gewog retains its rural charm, with traditional houses, monasteries, and community lhakhangs (temples). Mewang is also culturally rich, celebrating local festivals and maintaining age-old customs that are deeply rooted in Bhutanese tradition[6]. Under the proposed LLA project Three Schemes have been proposed from Mewang Gewog;

- Construction of Tshaluna -Khasakha Water Supply
- Rehabilitation of Irrigation Channels at Khasakha, Lamdru & Dalulum–Dalukha
- Construction of drinking water supply for Pumola-Woluna & rehabilitation of irrigation channels for Lower Woluna and Danglo

4.4.1 The Tshaluna –Khasakha Water Supply Scheme

The Tshaluna-Khasakha Water Supply scheme aims to address chronic water scarcity affecting both domestic consumption and agricultural production across five villages: Khasakha, Langdro, Tshaphu, Sigay, and Khasadrapchu. Validation findings confirm strong community readiness, adequate water availability at the proposed sources, and the absence of disputes or clearance obstacles. With a total beneficiary population of over 3,300 people, the project is strategically positioned

[6] https://thimphu.gov.bt/mewang-gewog/

to significantly enhance water security, livelihood stability, and resilience to seasonal shortages.

Water scarcity remains the most pressing issue, particularly during the dry season from February to June, when irrigation reliability declines and drinking water shortages peak in April. Despite the absence of visible land degradation signs, the communities emphasize the need for watershed protection, especially through intake fencing and improved source management. The existing Water Users Association (WUA) is functional and supported by established bylaws, although gender imbalance persists due to the absence of women in leadership roles. Institutional strengthening—particularly training in plumbing, bylaw revision, governance, and gender-inclusive participation—is critical for sustainable system operation.



Figure 20 View of Danglokha village, Mewang

Table 5 Tsaluna-Khasadrapchu Integrated Water Supply Scheme Profile

Parameters	***Characteristics/Profile***
Activity	Construction of Khasadrapchu Water supply
Proposed Source	Tshalunaney Stream
Source type	Stream
Distance from source (km)	15
Water availability at source	Yes
Any dispute for tapping water	No
Clearance difficulty (Forestry/Env./Social)	No
Community support	Workforce contribution in survey, clearances
Existing/Functional WUA	Yes
Villages to be served	Khasakha, Langdro, Tshaphu, Sigay, Khasadrapchu
Population – HHs/Institutions	880
Population – Male	1400
Population – Female	1980
Population – PWD	0

4.4.1.1 Community Needs and Ecosystem-based Adaptation (EbA) Measures

Land Use Challenges

Water scarcity is the most critical challenge affecting both domestic and agricultural water security. Although no visible signs of land degradation were reported, the acute

shortage of irrigation water limits agricultural productivity, particularly given that most farmland comprises dryland with no access to wetlands.

Seasonal Water Stress

The community experiences severe drinking water shortages during April, coinciding with the dry season. Irrigation water scarcity is most pronounced between February and June. Improving water reliability is therefore essential for both livelihoods and food security.



Figure 21 Existing Water Reservoir at Khasakha, Mewang

4.4.1.2 Required EbA/SLM Interventions

- Watershed management and protection measures
- Intake area fencing to safeguard source integrity
- Community-led monitoring to minimize sedimentation and maintain watershed health

4.4.1.3 Capacity Support Needed

To adopt sustainable land and water practices, communities require:

- Technical training on watershed and intake management
- Tools and materials to support agroecological initiatives
- Strengthened water governance through capacity building

4.4.1.4 Institutional Capacity and Governance

Water Users Association (WUA)

The Khasadrapchu WUA is functional and operates as the primary institution managing water distribution, maintenance schedules, and resource governance. Key features include:

- Membership obligation to follow WUA bylaws
- A joining contribution of Nu. 20,000/- for new members, used for minor maintenance and labour expenses
- Active involvement of households in meetings and collective decision-making

Gender Representation & Inclusion

No women currently serve on the WUA executive committee. Although women participate in general meetings and community gatherings (zomdu), social and cultural barriers limit their appointment to formal roles.

Institutional Strengthening Needs

The WUA requires capacity development in the following areas:

- Plumbing and technical skills for water caretakers
- Training on bylaw review, revision, and compliance
- Gender sensitization and facilitation to encourage equitable representation
- Strengthening O&M fund management

4.4.1.5 Risk Assessment and Management

Potential Risks

Potential risks associated with the project include:

- Soil erosion and localized flash floods near intake and conveyance alignments
- Potential overuse of water resources during peak agricultural periods
- Increased pressure on watershed areas due to climate variability

Existing Risk Mitigation Measures

Communities currently apply the following strategies:

- Active WUA oversight to ensure adherence to water-use guidelines
- Community awareness on sustainable water allocation
- Compliance monitoring by WUA members during dry periods

Recommended Enhancements

- Incorporation of watershed buffer zones
- Establishment of sediment control measures at the intake
- Climate-responsive water allocation guidelines within WUA bylaws

4.4.1.5 Community Monitoring and Evaluation System

Existing M&E Practices

Community-based monitoring and evaluation systems are already in place.

Key characteristics include:

- More than 10 monitoring events conducted annually based on emerging issues
- WUA convenes formal meetings three times per year
- Extensive household participation, including women

Indicators Monitored

Current monitoring focuses on:

- Water flow and availability
- Maintenance requirements
- Community compliance with WUA guidelines
- Seasonal water shortages and irrigation functionality

Capacity-building Needs

To strengthen M&E systems, communities would benefit from:

- Training on structured data collection and digital logging tools
- Workshops on interpreting indicators for adaptive management
- Templates for reporting water flow, system uptime, and maintenance logs

4.4.1.6 Actionable Recommendations

- Finalize intake location through dry-season flow assessment and prepare micro-alignment for the 15 km conveyance route during the final survey and assessments
- Design watershed protection measures, including intake fencing during the final assessment
- Review WUA bylaws and initiate inclusion of women representatives

- Conduct caretaker training (plumbing and O&M toolkits)
- Implement Water Safety Plan & Commission water treatment (e.g., chlorination where required)
- Strengthen WUA O&M fund and establish spare-parts inventory
- Develop and Initiate community M&E framework for flow, reliability, leak detection, and participation metrics

4.4.2 Pumola-Woluna Drinking Water Scheme

The Woluna Water Supply scheme proposes the abstraction of water from the confirmed Pumla Stream, with an estimated conveyance alignment of approximately 10 km. Water availability at the source is assessed as adequate, and no disputes or significant forest, environmental, or social clearance challenges are anticipated. Community cooperation is strong, with residents committed to supporting surveys and clearance processes.

The Pumla Stream is also referenced as a water source for Thimphu town, underscoring the need for formal inter-jurisdictional agreements to ensure equitable abstraction, sustainable source protection, and long-term climate resilience. Strengthening the Water Users Association (WUA), completing key data gaps, and improving governance frameworks are essential to advancing the project toward final design and implementation.



Figure 22 View of Waluna and Danglo Villages,Namseling Chiwog, Mewang

Table 6 Pumola _Woluna Water Supply Scheme Profile

Parameter	***Characteristics***
Gewog / Chiwog	Maedwang / Woluna
Project Activity	Woluna Water Supply Project (excluding distribution network) and Rehabilitation of Lower Woluna and Danglo Irrigation Channels
Source & Type	Pumola Stream (confirmed source), perennial stream with adequate water availability
Approx. Distance	~10 km (subject to confirmation through GPS/topographic survey)
Other Users	Also utilized as a water source for Thimphu town

Disputes / Clearances	No disputes anticipated; no major forestry or environmental clearance risks identified
Community Support	Active participation including workforce contributions for surveys and clearances
Beneficiaries	"Woluna 60–70"; Lhakhang and two tsamkhang with separate sources; seasonal Punakha herders; landless individuals (2) —

4.4.2.1 Community Needs and EBA

The Woluna community identifies water scarcity as the primary challenge, contributing to fallowed land, increased human–wildlife conflict, and heightened vulnerability to forest fires that reduce watershed vegetation and exacerbate source drying. Observable land degradation includes roadside landslides, monsoon runoff erosion, and inadequate drainage systems.

Despite limited land availability for fencing or large-scale interventions, the community remains open to co-financing feasible watershed protection measures. Improved catchment protection, drainage management, and erosion-control measures are crucial for long-term water security.

4.4.2.2 Institutional Arrangements, Governance, and Finance (WUA)

A Water Users Association is operational for both drinking and irrigation water, though formal registration is pending. Current governance features include:

- A male chairperson and caretaker
- Three women serving as treasurers
- Monthly collection of Nu. 300 per household
- Caretaker remuneration: Nu. 6,000/month
- Annual honoraria: Chair – Nu. 6,000; Treasurer – Nu. 4,000
- Current account balance: Approximately Nu. 80,000
- New-member entry fee: Nu. 35

Community-expressed needs include strengthened by law enforcement, role rotation mechanisms, improved remuneration systems tied to performance, training in pipe repair and plumbing, and acquisition of essential O&M equipment.

4.4.2.3 Risk Profile and Safeguards

The project area is susceptible to several risks:

- Pipe bursts along steep and unstable slopes
- Landslides triggered by monsoon runoff or road-cut failures
- Property damage in vulnerable sections
- Long-term risks arising from shared-source use with Thimphu town, potentially affecting water allocation during low-flow periods

A structured source governance mechanism—through an MoU or Payment for Ecosystem Services (PES) arrangement—is recommended to mitigate potential conflicts and safeguard sustainable yields.

4.4.2.4 Monitoring and Evaluation (M&E)

Current M&E follows a hierarchical reporting structure:

Tshogpa → Gewog Administration → Dzongkhag Administration

Improvements requested by local stakeholders include:

- Targeted training for tshogpas in monitoring roads, water systems, and community infrastructure
- Provision of smartphones for photographic and video documentation
- Introduction of rotational reporting arrangements to reduce disruptions caused by the five-year leadership cycle

Strengthening digital evidence systems and formal logbooks will significantly enhance transparency and preventive maintenance.

4.4.2.5 Actionable Recommendations

Technical Design and Survey

- Complete GPS and topographic surveys and develop a detailed hydraulic model.
- Define and cost the distribution network to ensure future integration.
- Incorporate geohazard mitigation measures such as retaining structures, lined drains, and slope stabilization in the final designs
- Strengthen intake protection through catchment planting, controlled access, and fire-risk reduction measures.

Source Governance and Water Security

- Initiate stakeholder negotiations with Thimphu authorities to develop an MoU or PES mechanism.
- Install simple flow-monitoring devices for dry and wet season yield assessments.

WUA Governance and Finance

- Formalize WUA registration and update bylaws to include TORs, rotation rules, and conflict-of-interest clauses.
- Review individual contribution levels based on OPEX requirements; link caretaker payments to measurable service-level indicators.
- Provide plumbing tools, repair kits, and establish an on-call maintenance roster.

Community M&E and Digital Reporting

- Adopt standardized logbooks for intakes, reservoirs, outages, repairs, and complaints.
- Provide smartphones for digital evidence collection.
- Conduct quarterly review meetings involving WUA, Tshogpa, and Gewog engineers.

SLM, Watershed, and Human–Wildlife Safeguards

- Improve drainage and stabilize erosion-prone sections.
- Pilot compact fencing or alternative crop-protection strategies in high-conflict areas.

4.5 Chang Gewog

Chang Gewog is one of the gewogs in Thimphu Dzongkhag, located in the western part of the district surrounding the southern and eastern outskirts of Thimphu city. Unlike the highland gewogs, Chang Gewog lies at comparatively lower altitudes, with gentle hills, fertile valleys, and forested slopes. Its proximity to the capital has brought modern infrastructure and services closer to its settlements, while parts of the gewog remain semi-rural and agriculturally focused. The residents of Chang Gewog engage mainly in agriculture, horticulture, and small-scale livestock farming, producing vegetables, cereals, and dairy products to supply Thimphu's urban market. Despite urban influences, the gewog maintains its traditional community life, lhakhangs (temples), and cultural festivals, blending the rural heritage of Bhutan with the changes brought by the city's expansion[7].

4.5.1 The Ngabiphu-Rama Water Supply Scheme

The Ngabiphu-Rama Drinking Water Scheme proposes abstraction from the Ngabiphug stream to serve settlements in Chang Gewog. Based on the validation, water availability at the source is reported as adequate, there are no other communities tapping from the same source, and no disputes or forest/environment/social clearance constraints are anticipated. The gewog/community will provide workforce support for surveys and clearances, and a functional WUA exists to support operations.

Institutional capacity is relatively strong: the WUA comprises 312 members with established office bearers, has been submitted to the Department of Water for formalization, collects annual fees (Nu. 3,600–4,200 depending on rental/income)

[7] https://thimphu.gov.bt/chang-gewog

and includes four women in executive roles. Priority capacity needs include operation and maintenance, basic plumbing, and bylaw strengthening (penalties and fee structures).

Community risk perception indicates no major issues with landslides or floods along the proposed alignment; however, stakeholders flagged potential issues with contractors and emphasized routing clearances along existing channels to minimize public objections. Current monitoring relies on biannual checks and routine caretaker rounds, with a request to establish a dedicated monitoring team and strengthen awareness on rules and regulations.

Table 7 Nagbiphu-Rama Water Supply Scheme Profile

Parameters	***Characteristic Details***
Gewog / Chiwog	Chang / Rama
Project Activity	Rama water supply project
Source & Type	Ngabiphug – Stream
Approximate Distance	To be confirmed
Water Availability at Source	Yes (reported adequate)
Other Users from Same Source	No
Disputes for Tapping	No
Clearance Difficulty (forest/envt/social)	No anticipated issues
Gewog/Community Support	Workforce contribution for survey and clearances
Existing/Functional WUA	Yes (functional)
Beneficiary Areas	Tokto, Kashithang, Jazam, Jomu–Jimthang, STCBL, Tsangreyna

Households / Institutions[8]	87 HHs; HM's orchard and companies (~2,200 acres)
Population	963
Male	506
Female	457

4.5.1.1 Community Needs & EBA

- The validation did not highlight land-use challenges, observed land degradation, or specific EbA/SLM interventions.
- However, given the stream source and the project's reliance on existing channels, watershed protection and intake safeguarding are prudent.
- Targeted consultations are recommended to prioritize practical measures (e.g., intake fencing, controlled access, and roadside drainage where required).

4.5.1.2 Institutional Capacity, Governance & Finance (WUA)

- Functional WUA with 312 members; office bearers include chairperson, treasurer, members, and caretaker; submission to Dept. of Water for formalization.
- Annual fees of Nu. 3,600 or Nu. 4,200 per member depending on rental/income categories.
- Women's participation: four women hold executive positions.
- Capacity needs: O&M training, basic plumbing/repair skills for the caretaker and team, and strengthening bylaws (penalties, fees, role clarity).

[8] Chang Gewog Administration 2026

4..5.1.3 Risk Profile & Safeguards

- Community feedback did not highlight any major issues of landslides and floods along the anticipated route. Nevertheless, a due diligence geohazard assessment is recommended given local terrain variability.
- Stakeholders flagged potential risks related to contractor performance. Clear contractual KPIs, supervision protocols, and community grievance mechanisms are advised.
- Clearances are expected to be smooth if the alignment uses existing channels; this should be validated during detailed survey and stakeholder engagement.

4.5.1.4 Community Monitoring & Evaluation (M&E)

- Biannual monitoring of source and distribution; caretakers conduct routine checks.
- Current participation appears limited to existing caretakers; a dedicated monitoring team with broader community representation is recommended.
- Capacity support requested includes awareness on rules and regulations and clarifying reporting lines (Tshogpa → Gewog → Dzongkhag).

4.5.1.5 Actionable Recommendations

Technical Design & Survey

- Conduct GPS/topographic survey and prepare a hydraulic model to size mains, appurtenances (BPTs, ARVs, scour), and anchorage for steep sections.
- Map geohazard hotspots and road-cut sections; specify slope stabilization (gabions/retaining) and lined drains where necessary.
- Protect the intake with fencing, screened inlets, and controlled access; design for sediment/debris exclusion.

Construction & Quality Assurance

- Define clear KPIs for contractors (schedule adherence, weld/joint quality, pressure testing, reinstatement) and appoint a supervision engineer.
- Adopt method statements for stream crossings, thrust blocks, and pressure management; require as-built documentation.

Governance & Finance (WUA)

- Pursue formal registration of the WUA with updated bylaws (roles/rotation, penalties, tariffs, conflict-of-interest).
- Link caretaker remuneration to Service Level Agreements (SLAs) (uptime, response time) and maintain transparent financial reporting to members.

Operations & Maintenance

- Provide O&M toolkits (repair clamps, couplings, spanners, repair sleeves) and training in leak detection and first-response repair.
- Establish an on-call rotational roster and emergency repair protocols.

Community Engagement & M&E

- Form a community monitoring team (including women and youth) and standardize logbooks for flows, outages, and repairs.
- Institutionalize biannual reviews with Gewog engineers and publish key performance dashboards to the community.

4.5.2 Changkhaphu-Hongtsho Water Supply

The Changaphu- Hongtsho Irrigation Water Supply scheme proposes abstraction from Chankhaphu to serve agricultural users in Chang Gewog. Validation indicates water availability at source, no other communities tapping the same source, no anticipated disputes, and no expected forest/environment/social clearance

constraints. The Gewog/community will contribute workforce for surveys and clearances, and a functional WUA is reported. Estimated beneficiaries: ~127 households.

Community priorities include addressing wildlife conflict, water constraints, and forest degradation, alongside observed land degradation. Requested supports include training and terrace construction to stabilize production on slopes. Currently, WUA leadership is all-male, with a stated need to train and incentivize women's participation. Monitoring is undertaken by Gewog officials, the water caretaker, and the chairman; capacity strengthening was requested. No social conflicts over water were reported; potential future deforestation was noted as a risk. Cropping is dominated by apples, potatoes, and vegetables; stakeholders suggest piloting greenhouses and strengthening the WUA.

Table 8 Hongtsho Toed-Maed Irrigation Scheme Profile

Parameters	***Characteristics/ Details***
Gewog / Chiwog	Chang / Hongtsho
Project Activity	Hongtsho WaterToed-Maed Irrigation Scheme
Source & Type	Changaphug – Stream
Approximate Distance	To be confirmed
Water Availability at Source	Yes (reported adequate)
Other Users from Same Source	No
Disputes for Tapping	No
Clearance Difficulty (forest/envt/social)	No anticipated issues
Gewog/Community Support	Workforce contribution for survey and clearances
Existing/Functional WUA	Yes (functional)

Beneficiary Areas	Hongtsho Toed-Maed
Households / Institutions[9]	127 HHs
Population	949
Male	521
Female	428



Figure 23 Changaphu Stream at Hongtsho, Chang

[9] Chang Gewog Administration 2026

4.5.3 Community Needs & Landscape/EbA

- Stakeholders cited wildlife conflicts, water issues, and forest degradation as primary land-use challenges. Land degradation is observed in the area.
- Requests include training and terrace building, indicating needs for slope stabilization and soil conservation.
- These point to an ecosystem-based adaptation (EbA) and sustainable land management (SLM) package to secure slopes, protect soil moisture, and reduce runoff/erosion impacts on the scheme.

4.5.4 Institutions, Governance & Gender

- WUA exists and is functional; current executive participation is all male, though women served previously.
- Community requests training with modest financial incentives to re-engage women in leadership roles.
- Support is needed for management and operational systems (e.g., O&M routines, fee/penalty enforcement).

4.5.5 Risk Profile & Safeguards

- No present landslide or flood risks were reported; nonetheless, undertake due diligence geohazard screening given terrain variability.
- No social conflicts over water were noted; however, potential deforestation is foreseen. Prioritize catchment/forest protection, responsible construction practices, and early engagement with forestry and community institutions to mitigate clearing pressures.

4.5.6 Monitoring & Evaluation (M&E)

- Current M&E relies on Gewog officials, the water caretaker, and the chairman for routine monitoring.
- A dedicated monitoring team with inclusive participation (women and youth) is recommended.
- Establish a simple results framework and clarify reporting along the Tshogpa → Gewog → Dzongkhag chain.

4.5.7 Cropping & Demand Implications

- Key crops are apples, potatoes, and vegetables. For design, complete an agronomic calendar and indicative crop water requirements to size storage and conveyance for dry-season reliability.
- Consider piloting greenhouses and strengthening WUA management for demand stewardship.

4.5.8 Actionable Recommendations

Technical Design & Construction

- Survey & Alignment: confirm source and delivery coordinates, distance, elevation profile, and pressure zones; micro-site intakes, crossings, anchors, and assessories (ARV, scour).
- Complete GPS/topographic survey and hydraulic design to size mains and accessories; identify pressure management and erosion-risk locations before construction.

- Protect the intake with fencing, screened inlets, controlled access, and sediment/debris exclusion features.

Governance, Gender & Finance (WUA)

- Codify WUA governance with refreshed bylaws covering roles/rotation, conflict-of-interest, penalties/fees, and transparent reporting.
- Implement targets/quotas or reserved positions for women; provide training and modest stipends to enable sustained participation.
- Confirm fee structure and create a ring-fenced O&M fund with quarterly disclosures.

Operations & Maintenance

- Provide O&M toolkits (repair clamps, couplings, spanners, sleeves) and training in leak detection and first-response repairs.
- Establish an on-call roster and emergency repair protocols; maintain a spare-parts cache.

M&E and Community Participation

- Form a community M&E team (including women and youth) and standardize logbooks for flows, uptime, leaks, response times, and complaints.
- Hold biannual reviews with Gewog engineers and publish a simple performance dashboard to the community.

EbA/SLM & Safeguards

- Support terracing of steep slopes, mulching, and micro-drainage to address degradation and stabilize irrigated plots.

- Coordinate with forestry and local institutions to avoid deforestation (controlled sourcing of materials, fire-risk awareness, catchment stewardship).
- Pilot non-intrusive wildlife deterrents and co-design crop/plot planning near forest edges to minimized HWC damages.

5. Summary of Key Findings: Implications for Final LLA Project Design

5.1 Synthesis of Findings

The community consultations conducted across Genyen, Kawang, Dagala, Mewang and Chang Gewogs provided robust validation of the Locally Led Adaptation (LLA) project design. Field-level discussions and site verifications confirmed that all proposed water supply and irrigation schemes are technically feasible, with adequate perennial water sources, no competing claims, and no major risks relating to forest, environmental, or social clearances. The consultations also refined the overall design by grounding it in micro-level realities—particularly the location of intakes, conveyance alignments, slopes requiring stabilization, and priority infrastructure segments needing rehabilitation.

The process strengthened alignment between community priorities and project interventions. Communities strongly emphasized chronic water scarcity, declining

spring flows, erosion risks, and improper drainage systems as core climate vulnerabilities affecting both domestic and agricultural water security. As a result, the project design will incorporate enhanced watershed protection components—such as intake area fencing, slope stabilization, micro-drainage, terracing, and long-term source protection measures—ensuring meaningful integration of ecosystem-based adaptation (EbA) and sustainable land management (SLM).

Institutional validation through consultations also deepened understanding of the capacity levels of Water User Associations (WUAs), revealing significant variation in functionality across gewogs. While some WUAs have established bylaws and fee collection systems, many lack formal registration, structured financial management, women's representation, and basic O&M competencies. These findings led to refined governance components within the LLA project, emphasizing WUA strengthening, leadership training, gender inclusion targets, and standardized operating procedures across all beneficiary chiwogs.

Overall, the consultations confirmed the project's strategic direction while providing the granular community-specific insights necessary to refine technical designs, prioritize interventions, and embed stronger governance and social inclusion frameworks.

5.2 Levels of Community Support and Ownership

Across all five gewogs, the LLA project received exceptionally strong community endorsement. The total participation of more than 700 individuals—including farmers, women's groups, youth, elected local leaders, sector officials, and civil society representatives—demonstrated the project's relevance and legitimacy. Attendance figures, often exceeding expectations, indicated that water scarcity and climate-induced vulnerabilities are shared and urgent concerns.

Community willingness to contribute workforce for topographic surveys, clearances, and minor works exemplifies a high level of ownership. Women's participation was notable, with near gender parity across consultations; this positions the project for strong gender-responsive implementation. Local governments—especially gewog administrations, Tshogpas, engineers, and RNR extension officers—displayed readiness to support implementation, technical coordination, and long-term oversight.

This strong community and institutional buy-in provide an enabling environment for the LLA project and reduces implementation risks typically associated with infrastructure and governance initiatives.

5.3 Consolidated Actionable Recommendations for LLA Implementation

The consultations generated a unified, cross-gewog set of recommendations that now shape the final implementation roadmap.

Technical and Engineering

The project should undertake detailed GPS/topographic surveys and hydraulic modelling to refine conveyance alignments, pressure zones, and structural protection requirements. Intake protection must include fencing, sediment control measures, and controlled access. Geohazard mitigation—particularly gabion walls, drainage improvements, erosion-control structures, and slope stabilization—must be integrated into final engineering designs. Providing standard O&M toolkits and first-response repair kits to WUAs is essential for long-term system sustainability.

Governance and WUA Strengthening

All WUAs require formal registration, updated bylaws, clearer role definitions, and transparent financial systems. Communities expressed strong preference for

consistent fee structures and penalties for non-compliance. Leadership representation for women should be institutionalized through explicit targets (minimum 30–35%), supported by capacity-building and flexible leadership responsibilities. Establishing dedicated O&M funds, strengthening bookkeeping practices, and aligning WUA governance with the Water Act will enhance accountability.

Operations, Maintenance, and Water Safety

Training on plumbing, leak detection, reservoir cleaning, and preventive maintenance must be delivered early during implementation. Caretaker functions should be supported through service-level agreements tied to measurable performance criteria such as system uptime and response time. A comprehensive Water Safety Plan must be operationalized in all gewogs, including regular chlorination protocols, sanitary inspections, and tank-cleaning schedules.

Ecosystem-Based Adaptation (EbA) and SLM

Given emerging risks to watersheds and land productivity, the project should incorporate terracing, micro-drainage, catchment protection, plantation, and fire-risk reduction measures. Communities also emphasized the need for soil conservation, improved agroecological practices, and protection of water source recharge areas.

Inter-Jurisdictional Coordination

Where sources are shared—particularly the Pumola stream—formal agreements or Payment for Ecosystem Services (PES) frameworks should be established between the gewog and Thimphu Thromde to ensure fair and sustainable water abstraction.

5.4 Strengthened Monitoring, Evaluation, and Learning (M&E) Framework

To ensure accountability, continuous learning, and sustainability, consultations recommended the need for a robust M&E framework that is embedded into the project design.

The system adopts a multi-tier reporting chain—WUA → Tshogpa → Gewog → Dzongkhag → Project Team—ensuring clarity in responsibilities and timely problem escalation. Standardized monitoring tools, including logbooks for water flow, outages, repairs, maintenance activities, and water-quality indicators, will be used across all gewogs. Digital evidence collection, including photographic and video documentation via smartphones provided to Tshogpas, will strengthen transparency and recordkeeping.

Routine monitoring will involve twice-monthly inspections of intakes and distribution systems, quarterly review meetings between WUAs and gewog engineers, and biannual district-level performance audits. Community dashboards displayed in gewog offices will communicate progress and keep beneficiaries informed. Annual cross-gewog learning exchanges will promote good practices and adaptive management.

6. Conclusion

The consultations have validated the strategic relevance, technical feasibility, and governance framework of the LLA project while strengthening its community-driven design. High levels of community support, refined technical insights, strengthened institutional arrangements, and a robust M&E system position the project to deliver transformative, climate-resilient water security outcomes for rural Thimphu.

7.Annexures

Annex 1: Consultation Agenda

ཐིམ་ཕུག་ རྫོང་ཁག་ནང་ ཆུ་ཞིན་སྲུང་དང་ གནམ་གཤིས་ཡུ་བརྟེན་ཐའི་བཙོང་བསྒྲུབ་ཡར་དྲག་གཏང་ནི།
མི་སྡེ་ཚོགས་འཛོམས།

Securing Water & Enhancing Climate Resilience in Thimphu (Rural) District, Bhutan

Community Consultation

AGENDA

Date: **5th January 2026**

Time: **9:30am - 17:00pm**

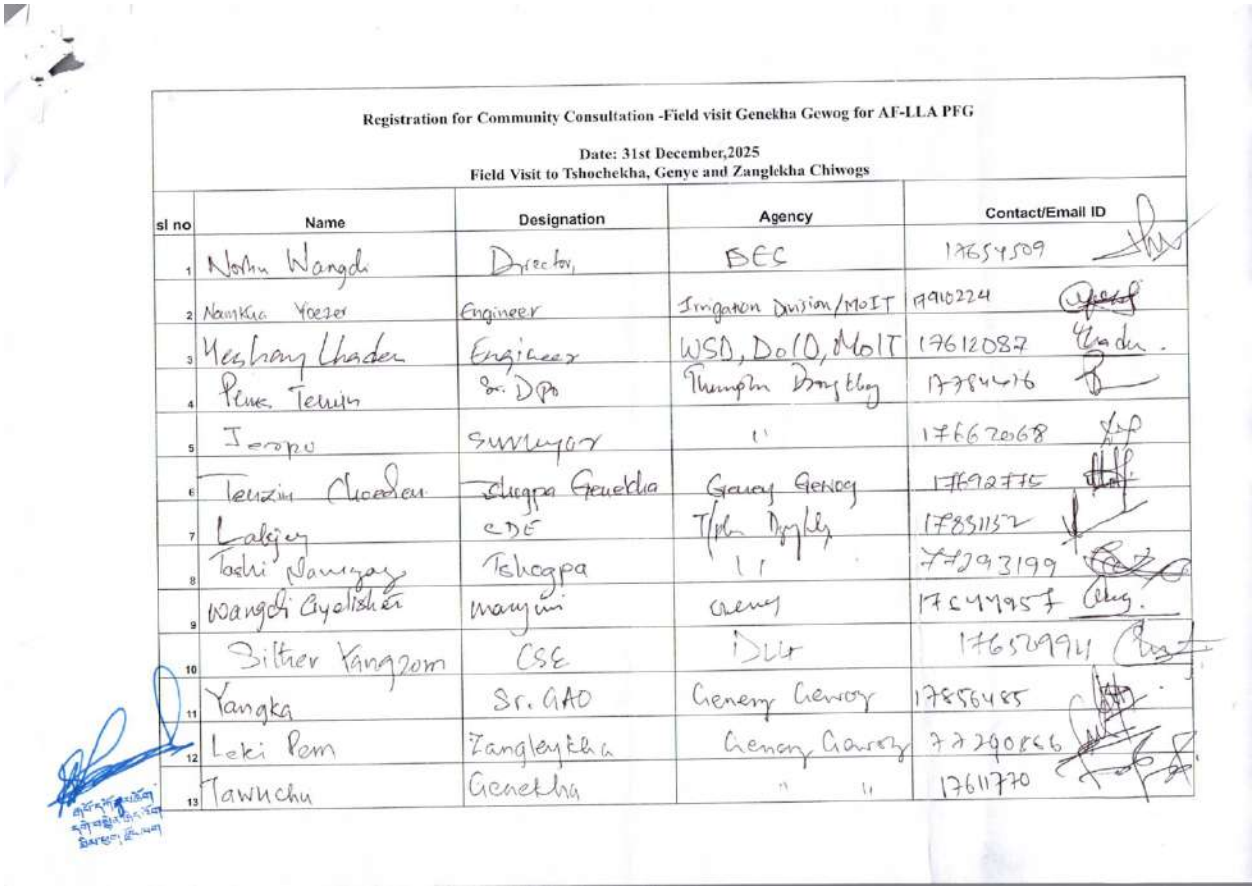
Venue: **GYT Hall, Dagala Gewog, Thimphu**

Time	Activities	Responsibility
09:30-09:35am	Welcome Note	Thimphu Dzongkhag

09:35-09.40am	Opening Remarks	Gewog Thrizin
09:40-10:30 am	Project Overview: Rationale, Goals & Outcomes	BES
10:30 -11:00 am	***Photo Session & Tea break***	
11:00 - 11.30am	Technical Feasibility Assessment Plan	DoID, WSD
11:30 - 12.30pm	Validation and Information Collection	BES/BTFEC/DoID/DMDF
12:30 - 13:00 pm	Discussions & Wayforward	All stakeholders
13.00 - 14.00pm	***Lunch***	
14:00 - 17:00 pm	• Field Visit to Project Sites	BTFEC/DMDF/DoID/Thimphu Dzongkhag/BES
16:00 - 16:30 pm	***Tea & End of Meeting***	

Rapporteurs: BES & BTFEC

Annex 2: Detailed participant lists and attendance sheets



Registration for Community Consultation -Field visit Genekha Gewog for AF-LLA PFG

Date: 31st December,2025
Field Visit to Tshochekha, Genye and Zanglekha Chiwogs

sl no	Name	Designation	Agency	Contact/Email ID
1	Norbu Wangdi	Director	BEC	17654509
2	Namkha Yoezer	Engineer	Irrigation Division/MOIT	17910224
3	Meshang Lhaden	Engineer	WSD, DoID, MoIT	17612087
4	Pema Tenzin	Sr. DPO	Thimphu Dzongkhag	17784416
5	Jeroju	Surveyor	"	17667068
6	Tenzin Choeden	Thuepa Genekha	Gasey Gewog	17792775
7	Lalsiey	CDE	T/Pa Dzongkhag	17851152
8	Tashi Namgay	Tshogpa	"	17793199
9	Wangdi Gyalsheer	Mangmi	Gewog	17649957
10	Sither Yangzom	CSE	DLO	17657991
11	Yangka	Sr. GAO	Genevy Gewog	17856485
12	Leki Pem	Zangleykha	Genevy Gewog	17790856
13	Tawnchu	Genekha	" "	17611770

10	Dem	F	Tshochaykha	17845554	
11	Chimi Dem	F	Tshochaykha	17749271	
12	Sangay Choden	F	Tshochaykha	17294253	
13	Sonam	F	"	17884963	
14	Chimi Dem	F	"	17647128	
15	Teshey Dem	F	Tshochaykha	17911698	
16	Lotay	Male	Genekha	17353800	
17	Kinley Choki	F	Tshochaykha	17379941	
18	Teshey	F	Zanglaykha	77312888	
19	Dorji Gyeltshen	M	Zanglaykha	17911015	
20	Karma Gyeltshen	M	Tshochaykha	17615262	
21	Khandu	F	Tshochaykha	17852254	

22	Gado	M	Genekha	17889685	
23	Kinley Rabgay	M	Genekha	17608568	
24	Passang Dem	F	Genekha	17729576	
25	Bago Zam	F	Zauglaytha	17439464	
26	Gyem Tshering	M	Tshochaykha	17854071	
27	Kinley Wangchuk	M	Tshochaykha	17674107	
28	Geshu	M	11	17637088	
29	Namgay	M	Tshochaykha	17428510	
30	Sangay Dem	M	11	17637065	
31	Tshering	M	11	17560942	
32	Kencho Deki	F	11	17334707	
33	Kencho	M	11	17662533	

58	Tshering	M	Geneetha	17699858	
59	Ugay	M	Geneetha.	17416998	
60	Kencho Zidha	F	Zanglaytha	17433864	
61	Dorji Tshomo	F	"	17950495	
62.	Sonam Norbu	M	Agri	17705595	
63.	Kencho	M	Crop	17488885	
64.	Labjay Labjay	M	CDE	17831152	
65.	Choki Dema	F	JE	17746713	
66.	Sither Yangzom	F	CSE	17658994	
67.	Tenzin Choeden	F	Tshogpa	17692975	
68.	Pema Tenzin	M	Sr. DzPO	WJ846016	
69.	Namkha Yoezer	M	Engineer	17910224	
70.	Tashi Namgay	M	Tshogpa	17703199	
71.	Namgay Wangchuk	M	Caretaker		
72.	Kencho Gyeltshen	M	Tshogpa	17971189	

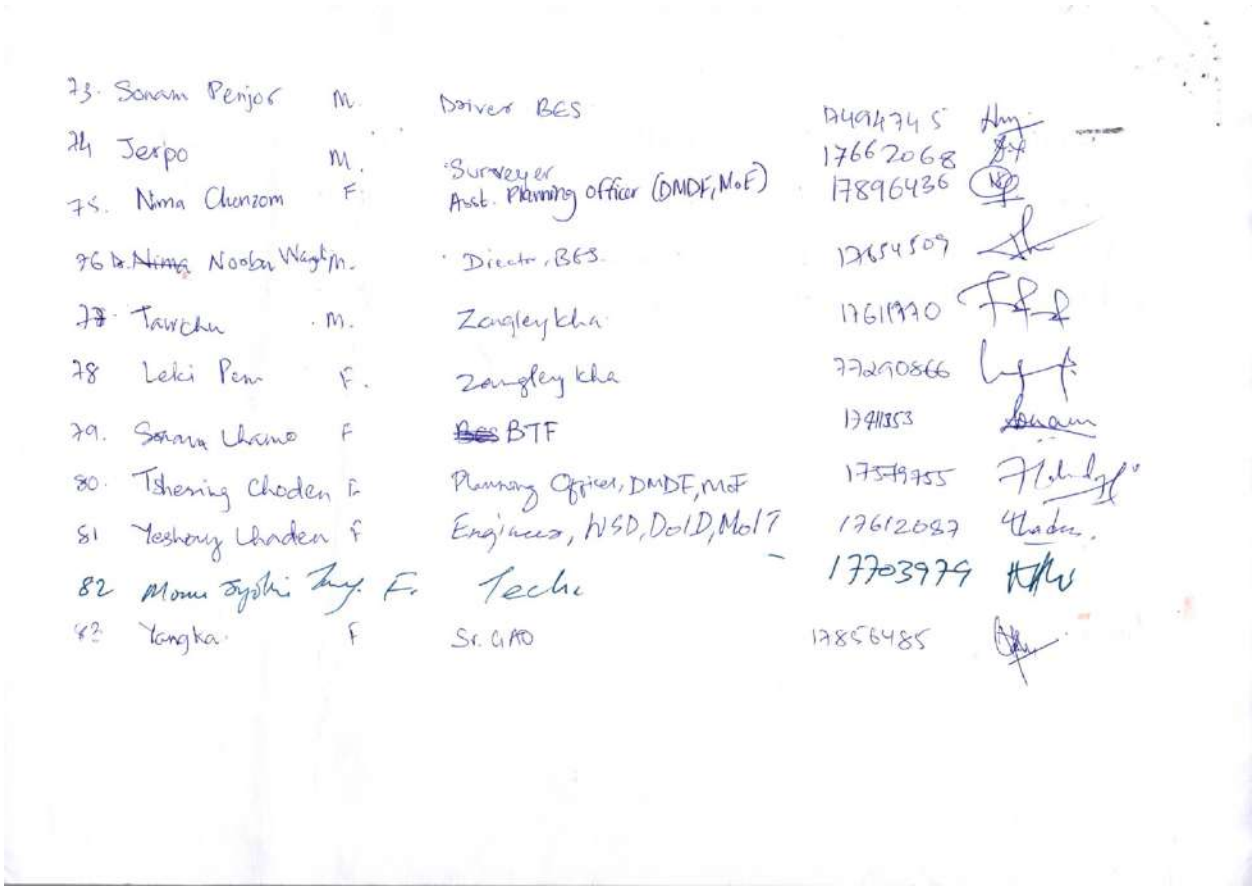
46	Kencho	F	zangaybha	FF3196F6	KD
47	Kencho Om ~~Kidha~~	F	11	FF252100	
48	Tandin	F	11	FF245F98	
49	Phurba	F	11	FF263354	
50	Passang Om	F	11	17380325	
51	Nado	M	11	FF350702.	
52	Rinchen Kidha	F	11	FF654018	
53	Karma Zam	F	11	FF637948.	
54	Pem	F	11	FF254898.	
55	Pema	F	1	FF74892	
56	Bottom	F	11	FF889338.	
57	Sangay	M	1	FF350491	

Registration for Community Consultation -Genekha Gewog for AF-LLA PFG

Date: 30th December,2025
Venue: GT Hall, Genekha

S/N	Name	Gender(M/F)	Village,Chiwog	Contact Number	Signature
1	Chencho Dema	F	Genekha	17666624	
2	Nhamo	F	Genekha	17490165	
3	Dorphum	F	Genekha	17671591	
4	Zangmo	F	Genekha	17637125	
5	Tshering Wangdi	M	11	17821674	
6	Dawa Geethchen	M.	Genekha	17931559	
7	Rinzin	M	Genekha	17655080	
8	Kencho Wangmo	F	Genekha	17491779	
9	Sonam Deki	F	Genekha	17821810	

34	Kencho Tshering	M	Tshochaytha	17301182	
35	Sangay Penjor	M	"	17449025	
36	Keincho	M	"	17449095	
37	Dorji	M	Tshochaytha	17533303	
38	Tshogay	M	zanglaytha	77482000	
39	Rinchen Dema	F	"	77750286	
40	Sangay choedrup	M	"	77229640	
41	Wangdi	M	zanglaytha	77603499	
42	Tshering Peldon	F	zanglaytha	17477075	
43	Thinley	M	zanglaytha	17740898	
44	Goram Wangchuk	M	zanglaytha	17957424	
45	Kadi	M	"	77219885	



73.	Sonam Penjor	M.	Driver BES	D4994745
74	Jerpo	M.	Surveyer	17662068
75.	Nima Chenzom	F	Asst. Planning officer (DMDF, MoF)	17896436
76	~~Nima~~ Noobu Wangm.		Director, BES	17654509
77	Tawchu	M.	Zangleykha	17611970
78	Leki Pem	F.	Zangleykha	77209866
79.	Sonam Lhamo	F	~~BES~~ BTF	17411353
80.	Tshering Choden	F	Planning Officer, DMDF, MoF	17549755
81	Yeshey Lhaden	F	Engineer, NSD, DoID, MoIT	17612087
82	Mom Sydki	F.	Tech.	17703979
83	Yangka	F	Sr. CAO	17856485

22	Thinley Wangchuk	M	Changtagang	17834535	
23	Tshomo	F	"	17640443	
24	Nyendo	M	Changtagang	17607319	
25	Tshultrim	M	Changtagang	17624147	
26	Tshewang Gyaltshen	M	"	17628524	
27	Karma Tshering		"	17980470	
28	Kinley Wangdi	M	"	17969388	
29	Kinga Tshering	M	"	17643158	
30	Kuenzang Gyaltshen	M	"	17672948	
31	Samten Wangchuk	M	"	14988028	
32	Dechen Tshomo	F	"	17440148	
33	Minda Zangmo	F	"	17646342	

58	Tandin Wangchuk	M	11	17655690	
59	Dil Maya Rai	F	11	17616930	
60	Sangay Tshn	~~M~~ F	11	17179010	
61	Ugyen Dhendup	M	11	17652608	
62	Karma Dorji	M	11	17627252	
63	Wangdi	M	11	17809720	
64	Tashi Dorji	M	11	17338050	
65	Ugyen Palden	F	11	17904465	
66	Lotay Rinchen	M	11	77207220	
67	Purna Bdr Mongar	M	11	77374178	
68	Tsherings	F	11	17876823	
69	Yangzom	F	11	17713587	
70	Sherab Zangmo	F	11	17744510	
71)	Dawa Tshering	M	Gaptshang	17839491	
72)	Dawa Tshering	M	11	17604490	
73)	Sangay Dorji	M		17810869	

Registration for Community Consultation -Kawang Gewog for AF-LLA PFG

Date: 1st January,2026
Venue: GT Hall, Kawang Gewog

sl no	Name	Designation	Agency	Contact/Email ID
1	Pema Tenzin	P.O.	Thimphu Dzong.	
2	Lekjay	D.E	Thimphu Dzong.	
3	Tshering Choden	DMDF	MoF	17519785
4	Namkha Yoezer	Engineer	ID, DoID, MoIT	
5	Yeshey Lhaden	Engineer	WSD, DoID, MoIT	17612087/ylhaden@moit.gov.bt
6	Norbu Wangdi	Director	BES	
7	Dorji Lhamo	Mess	BES	77277152
8	Mamta	Intern	BES	17946454
9	Ugyen	BES Driver	BES	17757512
10	Sonam Lhamo	P.S, BTF	BTF	

10	Leki Chenzom	F	Chengtaogang	17344801	
11	Gaden Zangmo	F	Changtaogang	17574310	
12	Jigme Tobgay	M	Changdagang		
13	Phuntsho Wangdi	M	Changdagang	17661385	
14	Sangay Wangdi	M	Changdagang	17772660	
15	Kinzang Choden	F	Changdagang	17974160	
16	Nguyen	M	Chandagang	17631064	
17	Sonam Wangmo	F	Clangdang	17733317	
18	Chaden	F	11	17609477	
19	Uguen Wangmo	F	11	17574979	
20	Rinchen Dorji	F	11	17690805	R. Dorji
21	Chador Wangmo	F	11	17690805	

46	Kezang Wangchu	M	—11—	17609032	
47	Jaime Chhoden	F	—11—	17652798	
48	Kunzang Dolma	F	11	17704100	
49	Chenzo	F	11	17629811	
50	Chamo	F	11	17731073	
51	Yeshi pelmo	F	11	17697234	
52	Kelzang chojay	M	11	17897699	
53	Kinley Dorji	M		17110025	
54	Sonam Phuntsho	M	11	17662940	
55	Jigme Tobgay		11	77485022	
56	Tshelthrim	M	11	17624147	
57	Pema Tshering	M	11	77614085	

87	Karma Choden	female	17545225	
88	Sonam Dorji	male	17346820	
89	Sangay Dorji	male	17810801	
~~91~~	~~Kinley Rabjor~~	~~male~~	~~17~~	
90	Rema Choezom	female	17236550	
91	Tshering Choden	Female	17809845	
92	Tshering Yangchen	F	17944283	
93	Tshering Tobgay	M	17922151	
94	Jorpo	M	17662068	
95	Sherab Pelden	M	17907055	
96	Karma Tshering	M	17875793	
97	Lemo	F	17792079	
98	Tenzin Yeshey	M	17934583	

Registration for Community Consultation -Kawang Gewog for AF-LLA PFG

Date: 1st January,2026
Venue: GT Hall, Kawang Gewog

S/N	Name	Gender(M/F)	Village,Chiwog	Contact Number	Signature
1	Karma Wangmo	F/male	Chhakungang	17631857	
2	Ugyen	"	"		
3	Sonam Wangchuck	"	"	17630887	
4	Pema Tshering	"	"		
5	Dophy	"	"	17878051 ~~17934~~	
6	Sigay			17626316	
7	Sonam chuki		"	17896667	
8	Tenzin Wangda		"	17636232	
9	~~KB Gurung Tenzin Metho~~		Changdogang	17111906	

34	Tenzin Meto	F	Chang-tag-nang	17654491	
35	Tshewang Choden	F	"	17746616	
36	Choden	F	"	17661674	
37	Jamyang T. Dorji	M	"	17560610	
38	Pema Choden	F	"	17671793	
39	Sonam Peldon	F	"	17820491	
40	Tashi Wangdi	M	"	17275300	
41	Jigme Demon	F	"	17711807	
42	Ann Wendy	F	"	-	
43	Kezang choden	F	"	17770602	
44	Lama Yeshi Jamtsho	M	-11-	17985353	
45	Kinley Tenzing	F	-11-	17724610	

Securing Water & Enhancing Climate Resilience in Thimphu (Rural) District, Bhutan (Community Stakeholder Consultations)

Date: **05/01/2026** Time: **9.00am - 17.00pm** Venue: **GYT Hall, Dagala Gewog, Thimphu**

ATTENDANCE SHEET

SL. No	Name	Mobile No.	Signature
1.	Namgay Wangchuk	17557612	
2.	Kinley Dem	77874609	
3.	Kinley Bidha	77204984	
4.	Daba	17366497	
5	Tshagay	77733109	
6	lemo	77410938	
7	phub pem	77212634	
8	Nidup Gyeltshen	17646983	
9	Namgay	77485498	
10	Tandin Penjor	17619352	
11	Tandin Gyelmo	77207271	
12	Dago Zangmo	77217031	
~~13~~	~~Tandin Wad~~		
13	Sonam Dorji (Kinley Namgay	77851281	
14	Wangay wangmo	77490805	

Female – 8
male – 5

Verified by
GNP

Securing Water & Enhancing Climate Resilience in Thimphu (Rural) District, Bhutan (Community Stakeholder Consultations)

Date: **05/01/2026** Time: **9.00am – 17.00pm** Venue: **GYT Hall, Dagala Gewog, Thimphu**

ATTENDANCE SHEET

SL. No	Name	Mobile No.	Signature
43	Sonam Pelden	17140580	
44	Gyempo Dorji	17644732	
45	Sonam Zangmo	17303088	
46	Kunga Wangmo	17651844	

Male → 24
Female → 22

Verified by

Gimp

1

Securing Water & Enhancing Climate Resilience in Thimphu (Rural) District, Bhutan (Community Stakeholder Consultations)

Date: **05/01/2026** Time: **9.00am - 17.00pm** Venue: **GYT Hall, Dagala Gewog, Thimphu**

ATTENDANCE SHEET

SL. No	Name	Mobile No.	Signature
1	Nala	77762466	
2	Koti	77608056	
3	Nidup	77974065	
4	Sangay	17898003	
5	Dawa	77405473	
6	Rinzin Dorji	17512447	
7	Kinga Dorji	77852341	
8	Tsechu (Kinley Choden)	77622183	
9	Kencho Gyem	77608274	
10	Rinzin Dorji (Sangay Dem)	17914661	
11	Phub Pem	17593274	
12	Ichha (Bhudhi)	17454871	
13	Kinga Zangmo	77303038	

Male = 10
Female = 3

Verified by

Cmp

Securing Water & Enhancing Climate Resilience in Thimphu (Rural) District, Bhutan (Community Stakeholder Consultations)

Date: 05/01/2026 Time: 9.00am - 17.00pm Venue: GYT Hall, Dagala Gewog, Thimphu

ATTENDANCE SHEET

SL. No	Name	Mobile No.	Signature
1.	Ngalwang Thamo	17986086	
2.	Bato (Kado	17660241	
3.	Thinley (Sangay Khand)	77235661	
4.	Lemo	77829153	
5.	Bachum (Hoto)	77203947	
6.	Passang om (PhubDem	17851431	
7.	GADO	17600912	
8.	Chey Chey (Lemo)	17673772	
9.	Namgay Wangmo	77789124	
10.	Thinley Dorji	77456405	
Female	7		
Male	3		

Verified by

G/UP

Securing Water & Enhancing Climate Resilience in Thimphu (Rural) District, Bhutan (Community Stakeholder Consultations)

Date: **05/01/2026** Time: **9.00am - 17.00pm** Venue: **GYT Hall, Dagala Gewog, Thimphu**

ATTENDANCE SHEET

SL. No	Name	Mobile No.	Signature
22	Temin Namgyel	17934902	
23	Phub Tenzin	~~17563205~~	
24	Phub Zam	~~77652110~~ 17442302	
25	Tshering Pelden		
26	Tandin Pelmo	77224162	
27	Lemo		
28	Dechen		
29	Nakum	77729688	
30	Wangchuk	17891671	
31	Namgay Zangmo	17809434	
32	Bidha	17379114	
33	Sonam Choden	77657720	
34	Tshering Dema	17642570	
35	Bangum	17646955	
36	kuenphen	17[illegible]	
37	kuchum		
38	Phub Om (Tendin Wangdi)	17624923	
39	Thinley	77346922	
40	Samten Wangmo	17429933	
41	Tshering Demen	17930256	
42	Kinga Dorji	17309178	

Verified by

Cmp

Chamgang Haed Chiwog.

ADAPTATION FUND

Securing Water & Enhancing Climate Resilience in Thimphu (Rural) District, Bhutan (Community Stakeholder Consultations)

Date: **05/01/2026** Time: **9.00am – 17.00pm** Venue: **GYT Hall, Dagala Gewog, Thimphu**

ATTENDANCE SHEET

SL. No	Name	Mobile No.	Signature
22	kencho Phub	17855778	
23	Chorten Zangpo	17654820	
24	Tandin Peldon	17281344	
25	Rinzin Bidha	17587006	
26	Dechen Zangmo	17671457	
27	Ugyen Zangmo	77332876	
28	Sonam Jamtsho	17644627	(kezang).
29	kinley Wangdi	17655007	
~~30~~	~~kencho Phub~~	~~17855778~~	
310	AP Sangay (lapchim)	17683158	
321	karma	17572660	
32	Chimi	77619394	
33	Guru Wangdi (kezang thaden)	17763856	
34	Nangay.	1749701	
35	Dago Pema.	77746664	
36	kezang Wangmo	17746092	
37	Dorji Tshering	17424628	

Female - 10

Male - 27 =

Verified by

Chp

1

Securing Water & Enhancing Climate Resilience in Thimphu (Rural) District, Bhutan (Community Stakeholder Consultations)

Date: **05/01/2026** Time: **9.00am – 17.00pm** Venue: **GYT Hall, Dagala Gewog, Thimphu**

ATTENDANCE SHEET

SL. No	Name	Mobile No.	Signature
1	Gado (Thrizin)	17600912	
2	Tsheweang Choden	17720935	
3	Lungki	17634036	
4	Pema Tenzin (DPO)	17711416	
5	Yeshay Lhaden	17612067	Lhaden.
6	Sonam Lhamo, BTF	17411353	Sonam
7	Mamta	17946454	
8	Dorji Lhamo	77274752	
9	Nima Chenzom	17896436	
10	Lobzy	17831152	
11	Tshering Choden	17609425	
12	Pema Zangmo	17837310	
13	Ugyen	17752582	
14	Ugyen Wangmo	17869266	
15	Phub Pem	17730764	
16	Sonam Zangmo		
17	Namgay Chencho	17624078	
18	Karma (Forest Madam)		
19	Tshering Wangmo		
20	Tashi Wangmo	17783178	
21	Chebi Wangchuk	17408021	

Prepared by

Gup

Changang Toed.

ADAPTATION FUND

Securing Water & Enhancing Climate Resilience in Thimphu (Rural) District, Bhutan (Community Stakeholder Consultations)

Date: **05/01/2026** Time: **9.00am - 17.00pm** Venue: **GYT Hall, Dagala Gewog, Thimphu**

ATTENDANCE SHEET

SL. No	Name	Mobile No.	Signature
1	Tshering (Bau)	77286255	
2)	Debi Pema	17445109	
3	Namgyel Wangmo	77741571	
4	Karma Budhar	17618754	
5	Dawa Zam	77719526	
6	Tado	17583517	
7	Wangyel	17931098	
8	Dophu	17303235	
9	Tenzinka	17548729	
10	Gyem Bidha	77607811	
11	Yangchen Lhamo		
12	Ugyen Lhamo	17666355	
13	Jigme Chodem	17796452	
14	Gyem Lhamo		
15	Lhakpa Tshering		
16	Namgay Wangdi		
17	Pema Choki		
18	Kelzang	17661712	
19	Phub Gyeltshen	17854634	
20	Tashi (Near Thinley)	16929619	
21	Yangden	17635469	

Verified by

GNP

Changang Maed Chiwog

Securing Water & Enhancing Climate Resilience in Thimphu (Rural) District, Bhutan (Community Stakeholder Consultations)

Date: **05/01/2026** Time: **9.00am – 17.00pm** Venue: **GYT Hall, Dagala Gewog, Thimphu**

ATTENDANCE SHEET

SL. No	Name	Mobile No.	Signature
1)	Phub Dorji	17628812	
2	kencho Bidha (Dorji)	17313203	
3	Sonam	77314174	
4	Sonam Dorji (Pema Thomo).	17712088	S.D.
5	Jamyang Zangpo	17703831	
6	Bhim Bdr	17859636	
7	kinley Dem		
8	kinley Pem	777 25839	
9	kezang Wangmo	17605310	
10	Gomchen (Amsong).		
11	Jamyang Phuntsho (Choki Dorji)	77252443	
12	Ngawang Loday (Kuenlay Pemo)	77882540	
13	kinga Wangdi	17809255	
14	Wangmo	17745119	
15	kinley Gyeltshen	77257756	
16	kago	17645844	
17	Dorji Bidha	17669738	
18	Singye Wangmo	17902408	
19	Nim Dorji	17791411	
20	Thangka Pem	77622566	
~~21~~	~~Wangmo~~	~~17745117~~	

Female - 13

Male - 7.

Verified by

Gup

Registration for community consultation for seucring water and enhance climate resilie 08/02/2026

SLNO.	NAME	CID.NO	VILLAGE	CONTACT NO.	SIGNATURE
1	Michup Zangmo	11561002205	Wallana	17600133	
2	Sangay Tshring	11407002324	"	17449829	
3	Karma Thinley	11410003678	"	17701887	
4	Rinzin Dema	11407002322	"	17745742	
5	Dawa Zam	11407002229	"	17890098	
6	Passang Dem		"	"	
7	Kezing Tshering	11407002316	"	17612355	

Tandin Wangyel
Danglo-Namseling Tshomba
Maedwang, Thimphu

8	Karmgay Tshering	11407002~~36~~	"	77233750	
9	Yangzom	10712002367	"	17898134	
10	Dorji Wongmo	11574000152	"	17630057	
11	Dechen Wangmo	11574000153	"	17354009	
12	Tandin Zangmo	10801002235	"	17651539	
13	Gyeltshen Wangdi	10712001329	"	17978978 ~~1785~~	
14	Dechen Choden	~~H5010022O~~ 10712001346		17978978	
15	Jigme Choden	11521002220		1783100 6	

Tandin Wangyel
Danglo-Namseling Tshogpa
Maedwang, Thimphu

Maedwang, Thimphu

16	Somam Dorji	11512002 831	"	17692673	
17	Dawa Zam	11410002382	"	17609610	
18	Choden Lhamo	11411702314	"	17655582	
19	Tashi Dorji	11107006558	"	17752748	
20	Tsho Tashi	10302000 918	"	"	
21	Migma	11407000320	"	17338822	
22	Tandin Phuba	11407000233	"	17693051	
23	Mima Dema		"	"	

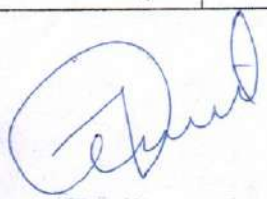
Tandin Wangyel
Dorgho-Namseling Tshorpa
Maedwang, Thimphu

24	Passang Gyem	11005002332	"	17947772	
25	Chhundu Gyem	10501000885	"	17602480	
26	Mobu wangdi	11572002126	"	17654509	
27	kezang Yuden	10602000806	Khasakha	17731019	
28	Dawa phuntho	11407004608	"	77679306	
29	Thapten Norbu	11407004461	"	"	
30	Uraki	11410002855 ~~Ngm~~ ~~11407000904~~	"	"	
31	Namgyel Zam	11407000904 ~~11407000998~~ ~~11407000904~~			

Tandin Wangyel
Dangle-Namseling Tshogpa
Maedwang, Thimphu

Dawa Zam
Khasadrapchu Tshogpa
Maedwang, Thimphu

32	Dophu	11407000998			
33	Myamar Lhamo	11407004557			
34	Thakpa Tshomo	0078	"	77413252	
35	Haji Dema Dorji	11216001891	"	17966689	
36	Phub Om	11407[illegible]888	"	17393260	
37	Thupten Kuenphel	10802003108	Laimuri	17388602	
38	Dawa Zangmo	10304008248	Khasakha	17921630	
39	Dawa Tangmo	11407001780	Sigay	17807991	





Tandin Wangyel
Danglo-Namseling Tshogpa
Maedwang, Thimphu

Dawa Zam
Khasadrapchu Tshogpa
Maedwang, Thimphu

40	Tandin Dorji	10066001919	11	17631397	
41	Yeshi Buhadur Gurung	11302000203	khasakhu		Yeshi
42	Choiden Zagmo	11503007140	11		
43	Dawa	11501001793	11		
44	Sangay Wangdi	~~11140~~ 11407000957	11		
45	Ugyen Tenzin	11521004069	11		
46	~~Ugyen T~~ Chato Pem	11407001189	11		
47	Sonam Tshering	11407001056	11		

Tandin Wangyel
Dongle-Namseling Tshogpa
Maedwang, Thimphu

Dawa Zam
Khasadrapchu Tshogpa
Maedwang, Thimphu

48	Tshering Lotay	11107000372	Kuasdrapchu	17594380	
49	Lhakpa Choki	11107004420	Kuasdrapchu	17635373	
450	Nidup wangmo	11107001109	Sigay	17683014	
51	Dago Dorji	11107007711	Kuasdrapchu	77477455	
52	Gijetshen	11107000706	11	17386730	
53	Yonchen Dema	11107080736	11	17140509	
54	Rinchen wangmo	11107001789	Sigay	17632970	
55	Nim Dem	11107002187	Tshophu	77390889	

Tandin Wangyal
Dangle-Namseling Tshompa
Maedwang, Thimphu

56	Thupten Norbu	11407004461	Khaeakha	17354431	
57	Sonam Dema	11513003401	11	17755757	
58	Tendin Dolma	11407004404	11	17680228	
59	Sonam Budha	11407000936	11	17436377	
60	Dorji Klaingchuk	11407000823	11	17626091	
61	Jamtsho	11407004547	11	17601779	
62	Thinley Gyeltshen	11407006811	11	17692371	
63	Tsagpa	11407004673	11	77419590	

Tendin Wangyel
Dzongkhag Tshogpa
Maedwang, Thimphu

Dewa Zam
Khasadrapchu Tshogpa
Maedwang, Thimphu

64	Tshendu Zam	11407000828	Khasakha	17378264	
65	Mohan kumar pradhan	11212000217	11	77449178	
66	Tshering	11407000829	11	77777514	
67	Rinzin		11		
68	Karma		11		
69	Dawa Zangmo		11		
70	Tashi Tshering	11407000980	11	77260387	
71	Zhab Dorji	11402000095	11	17827737	

Tenzin Wangyal
Danglo-Namseling Tshogpa
Maedwang, Thimphu

Dawa Zam
Khasadrapchu Tshogpa
Maedwang, Thimphu

72	Gongpo	11407000778	Khasakha	17963925	
73	Daw Gyeltshen	11407001021	11	17655352	
74	Tandin Tshering	11407004045	11	17606226	
75	Tshering Khangmo	11407001157	Lamdru	17377757	
76	Soma Maya Tamang	11810002929	11	17680056	
77	Menuka Ghimery	11306001977	Khasakha	17674767	
78	Tendin Yangdon	11407004640	11	17682041	
79	Ugyen Tshering	11407001711	Sigay	17982989	

Tandin Wangyel
Dangla-Namseling Tshogpa
Maedwang, Thimphu

Dawa Zam
Khasadrapchu Tshogpa
Maedwang, Thimphu

80	Pema Tshamchey	11407004708	Lamdru	17141736	
81	Rinzin Wangmo	11303002670	"	17791884	
82	Tenzin kiba	11407004523	Khaskha	17637151	
83	Migmar Lhamo	11407004643	"	77447742	
84	Tshamchoe	11407004565	"	77666580	
85	Namdol	11407004876	"	77438557	
86	Sonam Yeshi	11407004761	"	17963421	
87	Deepak Pokhrel	11308002050	"	17678008	

Tandin Wangyel
Danglo-Namseling Tshogpa
Maedwang, Thimphu

Dawa Zam
Jnaasadrapchu Tshogpa
Maedwang, Thimphu

88	Sangay Khando	11705000447	Khasakha	77739973	
89	Soram Chodun	11407001040	Khasakha	17992224	
90	Choda Zam	11407002667	Khasakha	17596898	
91	Tashi Wangchuk	11514003642	Khasakha	17676492	
92	Phuba	10804000091	Khasakha	17472430	
93	Kinzang Deki	11407000802	Khasakha	17604721	
94	Nakphel	11703002323	11	17334614	
95	Nanda Lal Rai	11216004617	11	17492002	

Tandin Wangyel
Dangbi-Namseling Tshogpa
Maedwang, Thimphu

Dawa Zam
Khasadrapchu Tshogpa
Maedwang, Thimphu

96	Uhakpa Tshering	11407002286	Tshapka	17639502	
97	Norbu Drukpa	11407020755	11	17602575	
98	Dawa	11407000718	Khasadrapchu	17356054	
99	Zangmo	11407002299	Tshapchu	17956711	
100	Chimi om	11407000708	Khasdrapchu	77222021	
101	Bir chal Bor Rai	11506000195	Tshapchu	17538431	
102	Tenzin	11407002298	11	17908275	
103	Kinzang Choden	11407002291	11	17600195	

Tandin Wangyel
Dangbo-Namseling Tshogpa
Maedwang, Thimphu

Dawa Zam
Khasadrapchu Tshogpa
Maedwang, Thimphu

104	Choden	11407002364 23.6	Tshaphu	7724509	
105	Wangchuk	11407001934	-11-	11	
106	Tshering Yangzom	11407001704	-11-	7327775	
107	Chhimi Dorji	11410006615	C/o drapchu	7119473	
108	Leki Chophel	11312007783	Tshaphu	7430551	
109	Dorji Gyeltshen	11403001100	Sigay	7724562 7	
110	Sangay	11407001761	-11-	7245626	
111	Minchi Wangmo	11407001711	Sigay	7962989	

Tandin Wangyel
Dorjilo-Namseling Tshogpa
Maedwang, Thimphu

Dawa Zam
Khasadrapchu Tshogpa
Maedwang, Thimphu

112	Passang Dema		woluna	17690098	
113	Kelang Tshering	11407002316	"	76/235-5	
114	Namgay Tshering	11407002326	"	77233750	
115	Kinley	11407007763	Sigay	17589388	
116	Thinley Pem	10302002127	"	17670535	
117	Passang Dorji	11407007815	"	77471480	
118	Chencho	11407007764	"	77469909	
119	Passang	11400006403	K/drapchu	17110039	

Tandin Wangyal
Deputy Nameseling Tshogpa
Maedwang, Thimphu

Dawa Zam
Khasadrapchu Tshogpa
Maedwang, Thimphu

120	Pema Yangzom	11512001442	Bhutanese	17638509	
121	Kezang Choden	11407002334	"	17609341	
122	Jigme Sangay	11407002333	"	17716860	
123	Nidup Zangmo	11501002205	"	17600133	
124	Sangay Tshering	11407002324	"	17449829	
125	Karma Thinley	11400003678	"	17018587	
126	Pintin Dema	11407002372	"	17745747	
127	Dawa Zam	11409000229	"	17890098	

Dawa Zam
Khasedrapchu Tshogpa
Maedwang, Thimphu

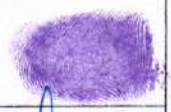
128	Sonam		Wolung		
129	Jigme Wangchuk		〃	17278023	
130	Khandu Chamo		〃		
131	Tshering Choki	11606002324	〃		
132	Wangchuk Dorji	11501000911	〃	77832380	
133	Sonam Choki	10601002055	〃	17598295	
134	Sangay Norbu	11607002566	〃	17752748	
135	Nangay Rema Chamo	10715004145	~~11607002350~~ 〃	17718105	





Tandin Wangyel
Dewle-Namseling Tshogpa
Maedwang, Thimphu

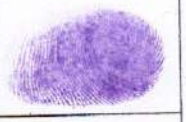
Dawa Zam
Khasadrapchu Tshogpa
Maedwang, Thimphu

136	Pemathanda	11302001757	Khoskha		
137	Ashim Namgay Wonchuk	11407002018	11	17743427	
138	Nidu Pem	11407002186	11	17655770	
139	Rinzin pelintso	11407003456	11	17603657	
140	Jigme Namgyel	11407000099	11	17621929	
141	Pem Zam	11407000185	Lamdru	17954557	
142	Nima Choki	11203005824	11	77341308	
143	Chador	11704003142 ~~11407~~	11	17230805	

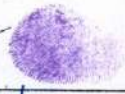
Tandin Wangmo
Dorjo-Kamedling Tshogpa
Trashiwang, Trashi Yangtse

Dawa Zam
Khasadrapchu Tshogpa
Trashiwang, Trashi Yangtse

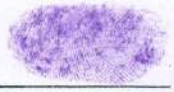
144	Pem	11407002307	Tshaphu	17846400	
145	Pelden	11407006718	Kildrapchu	17331736	
146	Tshering Wangmo	11407001801	Sigay	17865127	
147	Nim Dorji	11407002289	Tshaphu	17740241	
148	Yangchen Lhamo	11407002266	11	17238231	
149	Sangay Bidha	11407002280	11	77457177	
~~150~~ 150	Tshewang Dema	11308003671	11	77611889	
151	~~Dawa~~ Dem	11407007751	11	17587534	

152	Ugyen Bidha	11407000748	Tshaphu	17956769	
153	Tsheriq Yuden	11407002274	11	17611814	
154	Tenzin Nidup	11407004466	Khasakha	17612664	
155	Namgay Dukpa	11210002374	11	17681735	
156	Rinchen Namgay	11407000815	11	17819784	
158	Soman Zangmo	11407000816	11	17757403	
159	Chencho Lhamo	11407001025	11	17725997	
180	Sherap Yangzom	11407001065	11	17300378	

161	Kelzang Dorji	11407000773	Khasalsha	17673967	
162	Namgay Pem	11407001054	11	77205121	
163	Sangay Khando	11705004447	Khasalsha	77739973	
164	Sanam Chodu	11407001040	11	17992224	
168	Choden Zam	11407002667	11	17596898	
169	Tashi Wangchuk	11514003642	11	17676492	
170	Phuba	10804000091	11	17472430	
171	Kinzang Delek	11407000802	11	17604721	

177	Nakiphel	11703023 23	Khasakha	17384614	
178	Nanda lal Rai	11216004617	11	17492002	
179	Thupten Norbu	11407004461	11	17354421	
180	Tenzin	11407000862	11	17578201	
181	Kinga Tanchin	11407001132	Lamgro	17858449	
182	Ugyen Tshering	11407000873	Khasakha	17648338	
183	Sherab Dolma	11407004521	11	17783549	
184	Dechen	11407008 36	11	17654685	

185	Tenzin Wozer	1140700424S	Khandro	7634015	
186	Tshering Tobgyel	1140700467S	-11-	7754432	
187	Rinchen Tshering	1140700445S	-11-	7815605	
189	Thupten Dawa	1140700456S	-11-	7618553	
190	Tenzin Chophel	1140700415S	-11-	7642994	
191	Tenzin Wangdi	1030900281S	-11-	7634579	
192	Dolma	1140700417S	-11-	7723582I	
193	Jeki Pem	1140700447S	-11-	7652544	

194	Phub Dorji	11202002896	Khaschakha	77101671	
195	Kelzang Soonam	11607001530	"	17118089	
196	Kelzang Choden	11407000898	"	17732163	
197	Rinzin Dema	10607002278	Lamdru	17484640	
198	Kinley Wangdi	11002000446	"	17324551	
199	Lobzang Choden	11309003584	"	17301796	
200	Lhakpa Tshering	11407004820	"	17644347	
201	Rita Maya Gurung	11213000761	Tshaphu	17958969	

202	Thuji Pa	11407004401	S'Singa Tshogpa	17605027	
203	Rinzin	10801001490	Lhaling	17467605	
2081	Tendin Wangyel	11407000031	Norseling Tshogpa	17454565	
	Official from BTF, MOF, BES, Dzongkhag				
	gewog.				
205	Tshewang Rinzin	1	HPC		
206	Tashi Gyeltshen - So. Dzongrab.	1	Dzongrab.		
207	Letjay		Chief DT		

208	Rama Tenrin	So. DPO			
209.	Sheikh Chenzon	Sek Engineer			
210 -	Sonam Dorji	Technician			
211	Karma Wangmo	Technician			
212	Tandin Rama -	GYP			
213	Tshering Pem	GAO.			
214.	Dr Norbu	BES.			
215	Intern -				

Public Consultation Meeting for Securing Water & Enhancing Climate Resilience (~~officials~~)

Venue : Chang Gewog Office

Date 9-Jan-26

Sl.No	Name	Designation	Contact No.	Email ID	Signature
29.	Changa Thamo		17311741		
30.	Kelzang Tenzin		17514508		
	Migyur Wangmo	Tshogpa	17698192		

Public Consultation Meeting for Securing Water & Enhancing Climate Resilience (~~officials~~) Rama Chiwog.

Venue : Chang Gewog Office

Date 9-Jan-26

	Sl.No	Name	Designation	Contact No.	Email ID	Signature
59	1	Sonam Dema	-	17880851	—	Dema
60	2	Dechen		17665009		Dech
61	3	Tashi Pem		17690854		T.P.
62	4	Shachala		77431100		
63	5	Sonam Dema		17722410		S.D
64	6	Sangay Tshering	Civil Servant	17693263		
65	7	Samten Thamo	Farmer	17914180		
66	8	~~Sonam Dema~~ Ugyen Wangchuk	Farmer	17612990		
67	9	Ngawang Norbu	"	17635086		
68	10	Chador Wangdi	"	—	—	
69	11	Tshering Dorji	"	~~17~~ //		
70	12	Kinley Chezom	"	77661467		
71	13	Tashi Wangdi	"	77442		
72	~~14~~	Kinley Tshering	"	17664435		

Public Consultation Meeting for Securing Water & Enhancing Climate Resilience (officials)

Venue : Chang Gewog Office

Date 9-Jan-26

Sl.No	Name	Designation	Contact No.	Email ID	Signature
101.	Tashi Rgyelbo.	Dasho Dzongda			
102.	Sonam	farmer	77256311	—	
103.	AP - Kencho	"	—	—	
104.	Sonam Lhamo	P.S. BTF	17411353	sonaml@bhutanbiofund.bt	
105.	Tshering Choden	DLR	17609423	tsheringc@thimphugov.bt	
106.	Yeshey Lhaden	Engineer	17612087	ylhaden@moit.gov.bt	
107.	Kinley Chozom	Tshogpa	17503632	"	
108.	Dorji Wangdi	Tshogpa	17615167.		
109.	Chimmi	Forest	"	"	
110.	Karma Dema	"	"	"	
111	Kencho	farmer	17752191	"	
112	Karma	"	—	—	
113	Udey	"	—	—	
114	Kinley	"	—	—	

Public Consultation Meeting for Securing Water & Enhancing Climate Resilience (Hongtsho Chiwog)

Venue : Chang Gewog Office

Date 9-Jan-26

Sl.No	Name	Designation	Contact No.	Email ID	Signature
15	Karma	Farmer	77872115		
16	Chimi Rinzin	Farmer	77324400		
17	Rinchen	[illegible]	17724696		
18	Pema Lhazom		17555044		
19	Tshering Zam				
20	Chimi Lhamo	Farmer	17772620		
21	Yonten Phuntsho				
22	Thongki				
23	Kezang Youden				
24	Pema Dema	"	17[illegible]2550		
25	Needup Dawa Needup		17429815		
26	Sonam Pelmo		16235324		
27	Sonam Peldon		17717734		
28	Kinley		17600525	77371887	

Public Consultation Meeting for Securing Water & Enhancing Climate Resilience (officials)

Venue : Chang Gewog Office

Date 9-Jan-26

	Sl.No	Name	Designation	Contact No.	Email ID	Signature
45	a	Mumta Maya Ghalley (F)	Intern	17446454	-	
46	b	Deji Lhamo (F)	Intern	77277152		
47	c	Namkha Yoezer (M)	Engineer	17910224	yoezernamkha65@gmail.com	
48	d	Yeshey Lhaden (F)	Engineer	17612087	y.lhaden@cwoit.gov.bt	
49	e	Sonam Namgay (M)	Sr. Tech	17655855	drukpasonam7@gmail.com	
50	f	Kumba Deji (M)	A.E	17415265	kumbadeji@thimphutown	
51	g	Nima Chenzom (F)	Asst. Planning Officer	17896486	nchenzom@moe.gov.bt	
52	h	Tashi Dolma (F)	Comms Officer	77447123	tashi@thimphutown.gov.bt	
53	i	Jamyang Lhamo (F)	Manguni	17633480	jamyanglhamo016@gmail.com	
54	j	Lekjay (M)	CDE	17831152	lekjay@thimphutown.gov.bt	9/01/2026
55	k	Karma Chebi (F)	CCO	17343962	-	
56	l	Sonam Zangmo (F)	GUP	17633393	sonamzangmo55@gmail.com	
57	m	Namgay Wangmo (F)	SATO	17663458	namgaywangmo@thimphutown.gov.bt	
58	n	Deelen Tshomo (F)	AE	17661463		

Public Consultation Meeting for Securing Water & Enhancing Climate Resilience (officials)

Venue : Chang Gewog Office (Hongtsho Chiwog)

Date 9-Jan-26

	Sl.No	Name	Designation	Contact No.	Email ID	Signature
87		Kezang Dolkar.		77236579		
88		K.K. Jogi	Ranger(II)	17710812		
89		Dev Alley.		17674055		
90		Lhapchu.		17671433		
91		Urmila Rai		77439160		
92		Tshering Jatsho.				
93		Jamba Ngawang				
94		Tsheden.		17845256		
95		Phuntsho Dema.		17295936		
96		Uchungla.				
97		Tshering Dolkar (A)				
98		Tshering Dolkar (B)		17632237		
99		Tenzin Tshelthrim		17473455		
100		Tenzin Jordan		77406791		

Public Consultation Meeting for Securing Water & Enhancing Climate Resilience (Hongtsho Chiwog)

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Date 9-Jan-26

Sl.No	Name	Designation	Contact No.	Email ID	Signature
1	Hari Gupikshen	Chief, RUB	17644442	moneychenden@gmail.com	
2	Thatu	Farmer	17306755		
3.	Tshering Peldon	"			
4	Cho-zangmo	"			
5	Sherub Choden	"	17669065		
6	Dorji Drukpa	"	17642184		
7	Nima Dorji	SLopen	17675501	11909000466	
8	Chandra Maya ~~Chetri~~ Tamang	Sr. Teacher	17606640	dhsinghkato@gmail.com	
9	Kinley Dorji	Farmer	17743436		
10	Dema	"	77280480		
11	Tenzin Dema		17682136		
12	Kunga Wangmo	"	17794031		
13	Yeshi Wangmo	Farmer	17844873		
14	Sonam Chokey	Business	77286311	somchokey39@gmail.com	

Public Consultation Meeting for Securing Water & Enhancing Climate Resilience (Rama Chiwog)

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Date 9-Jan-26

Sl.No	Name	Designation	Contact No.	Email ID	Signature
31.	Sangay Phuntsho		17610668	SangayP@tanmoice.gov.bt	
32.	[illegible]		17628970	[illegible]	
33.	Figmi Dorji		17111085	jigmedorji2000@gmail.com	
34	Karma Namgyel		17561322	karma.namgyel@gcit.rub.edu	
35	Sangay Tenzin		17559978	sangaytenzin5@gmail.com	
36	Tsagay		17604847	-	
37	KarChung		17985546	—	
38	Ngawang chophel		17621075	-	
39	Dawa Tshering		17997113	—	
40	kezang yeden		17627829		
41	Tshomo		17627829		
42	Tandin Zam		77222692		
43	kinley chozom		17643464		
44.	Tsewang pem	farmer	—	—	

Public Consultation Meeting for Securing Water & Enhancing Climate Resilience (~~officials~~)

Venue : Chang Gewog Office

Date 9-Jan-26

(Mongtsho Chiwog)

	Sl.No	Name	Designation	Contact No.	Email ID	Signature
73	68	Ugyen Chophel	Business	77620877	—	
74	69	Ikinjam Deki	Business	17640345	—	
75	70	Sampa Ngawang	Farmer	77606637	—	
76	71	Pema choden	Thagpa	17615167		Phoden.
77	72	Dechen zangmo	care taker	17980211		
78	73	Tshering Pem		77320109		
79	74	Tsering Gyaltsho	Farmer	77378066		
80	75	Karma Choki		17864473		K Choki
81	76	Tsering Dolkar (A)	farmer	77266076		
82	77.	Sonam Lhamo	"	77371887		S.L.
83	78	Lobzang	farmer	77455607		
84	79	deki zam	Farmer	77309181	—	
85	80.	Dechen Zangmo	farmer	—	—	
86	81.	Sonam Lhamo	farmer	—	—	

Public Consultation Meeting for Securing Water & Enhancing Climate Resilience (Hongtsho Chiwog)

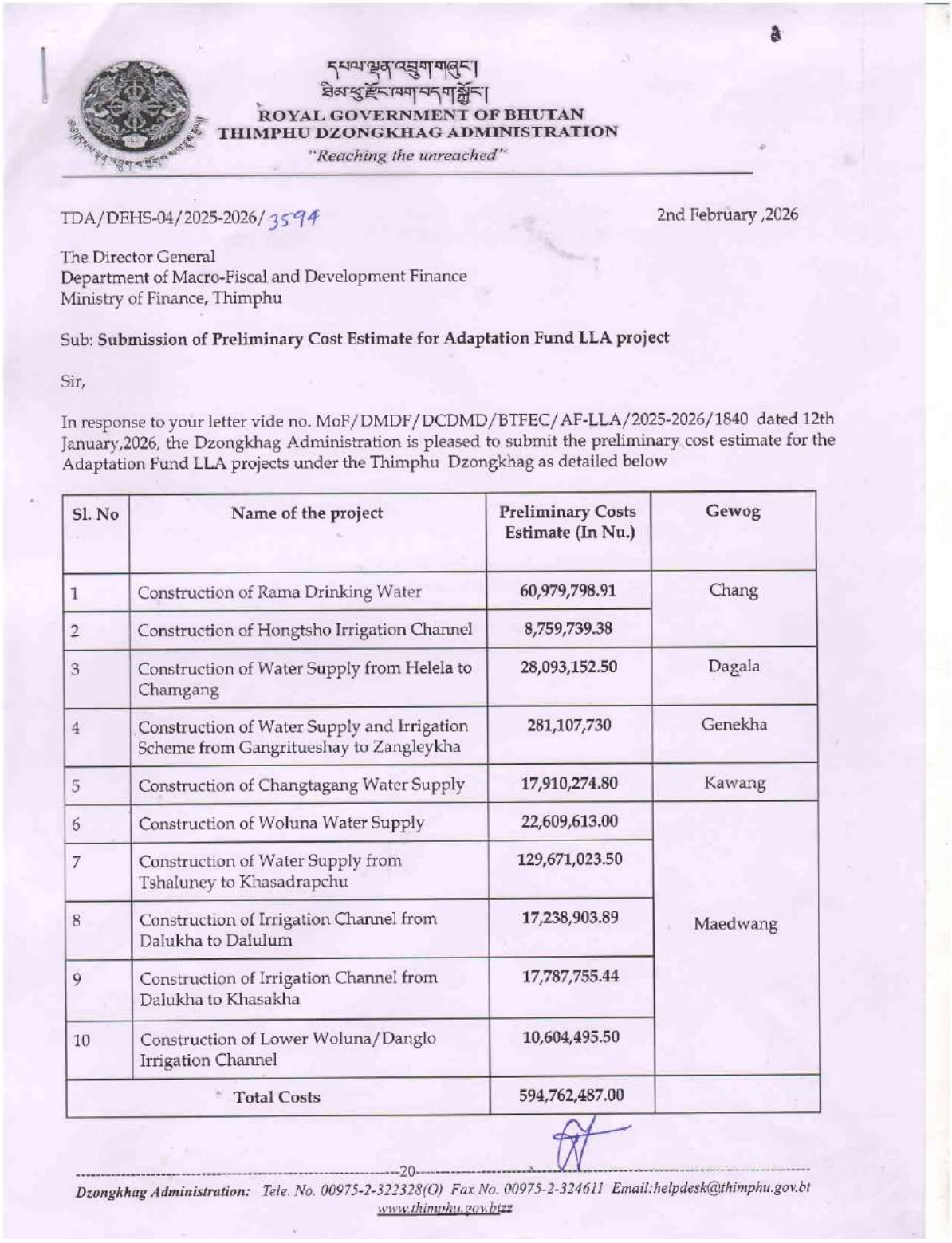
Venue : Chang Gewog Office

Date 9-Jan-26

Sl.No	Name	Designation	Contact No.	Email ID	Signature
115	Sonam Lhamo				
116	Kuenzang Dema		77618523		
117	Towpo		17619970		
118	Pema Youden	Ex- Nurse	17686245	pemaydon9@gmail.com	
119	Dorji Zangmo		17697800		
120	Minjur.		17628961		
121	Tshering Dolkar		17794031		
122	Tshering Pem				
123	Wangmo		77810747	NIL	
124	Phuntsho Dema wangmo		77372042		
125	Karma Cyeltshen	Farmers			
126	Tandin Om		17612275		
127	Karma Choki				
128	Phurpa Tshering		17701854		

128

Annex 3 Preliminary Cost Estimates of the Schemes



དཔལ་ལྡན་འབྲུག་གཞུང་།
ཐིམ་ཕུ་རྫོང་ཁག་བདག་སྐྱོང་།
ROYAL GOVERNMENT OF BHUTAN
THIMPHU DZONGKHAG ADMINISTRATION
"Reaching the unreached"

TDA/DEHS-04/2025-2026/3594 2nd February ,2026

The Director General
Department of Macro-Fiscal and Development Finance
Ministry of Finance, Thimphu

Sub: **Submission of Preliminary Cost Estimate for Adaptation Fund LLA project**

Sir,

In response to your letter vide no. MoF/DMDF/DCDMD/BTFEC/AF-LLA/2025-2026/1840 dated 12th January,2026, the Dzongkhag Administration is pleased to submit the preliminary cost estimate for the Adaptation Fund LLA projects under the Thimphu Dzongkhag as detailed below

Sl. No	Name of the project	Preliminary Costs Estimate (In Nu.)	Gewog
1	Construction of Rama Drinking Water	60,979,798.91	Chang
2	Construction of Hongtsho Irrigation Channel	8,759,739.38	
3	Construction of Water Supply from Helela to Chamgang	28,093,152.50	Dagala
4	Construction of Water Supply and Irrigation Scheme from Gangritueshay to Zangleykha	281,107,730	Genekha
5	Construction of Changtagang Water Supply	17,910,274.80	Kawang
6	Construction of Woluna Water Supply	22,609,613.00	Maedwang
7	Construction of Water Supply from Tshaluney to Khasadrapchu	129,671,023.50	
8	Construction of Irrigation Channel from Dalukha to Dalulum	17,238,903.89	
9	Construction of Irrigation Channel from Dalukha to Khasakha	17,787,755.44	
10	Construction of Lower Woluna/Danglo Irrigation Channel	10,604,495.50	
Total Costs		594,762,487.00	

-20-

Dzongkhag Administration: Tele. No. 00975-2-322328(O) Fax No. 00975-2-324611 Email:helpdesk@thimphu.gov.bt
www.thimphu.gov.btzz

Please kindly note that this estimate is based on the preliminary survey and is subject to revision/change following the detailed engineering survey & design upon activity level approval.

Find attached the detailed cost estimates.

Thanking You

(Minjur Dorji)
Dzongdag

Copy to:

1. Managing Director, Bhutan Trust Fund for Environment Conservation for his kind information.
2. Executive Director, Bhutan Ecological Society for kind information.
3. TWG Members, DoID, for kind information.
4. Planning Officer, Thimphu Dzongkhag for his kind information.
5. The Gups, Chang, Dagala, Kawang, Geney & Maedwang, for necessary information.

Dzongkhag Administration: *Tele. No. 00975-2-322328(O) Fax No. 00975-2-324611 Email:helpdesk@thimphu.gov.bt*
www.thimphu.gov.btzz