



ADAPTATION FUND

AFB/PPRC.14/10
6 March 2014

Adaptation Fund Board
Project and Programme Review Committee
Fourteenth meeting
Bonn, Germany, 18-19 March 2014

Agenda Item 6 g)

PROPOSAL FOR INDIA (5)

Background

1. The Operational Policies and Guidelines (OPG) for Parties to Access Resources from the Adaptation Fund (the Fund), adopted by the Adaptation Fund Board (the Board), state in paragraph 44 that small-size adaptation project and programme proposals, i.e. those that request funding not exceeding US\$ 1 million, would undergo an expedited one-step approval process. In this process, the proponent would directly submit a fully-developed project proposal which would undergo technical review by the secretariat, be reviewed by the PPRC, and ultimately require the Board's approval.
2. The Templates approved by the Board (OPG, Annex 4) provide a project and programme proposal template. For the review of a fully-developed proposal, the following five criteria are applied when reviewing the project:
 1. Country Eligibility,
 2. Project Eligibility,
 3. Resource Availability, and
 4. Eligibility of NIE/MIE.
 5. Implementation Arrangements.
3. It is worth noting that since the twenty-second Board meeting, the Environmental and Social (E&S) Policy of the Fund was approved and consequently compliance with the Policy has been included in the review criteria both for concept documents and fully-developed project documents. The proposals template was revised as well, to include sections requesting demonstration of compliance of the project/programme with the E&S Policy.
4. In its seventeenth meeting, the Board decided (Decision B.17/7) to approve "Instructions for preparing a request for project or programme funding from the Adaptation Fund", contained in the Annex to document AFB/PPRC.8/4, which further outlines applicable review criteria for both concepts and fully-developed proposals.
5. Based on the Board Decision B.9/2, the first call for project and programme proposals was issued and an invitation letter to eligible Parties to submit project and programme proposals to the Fund was sent out on 8 April 2010.
6. According to the Board Decision B.12/10, a project or programme proposal needs to be received by the secretariat no less than nine weeks before a Board meeting, in order to be considered by the Board in that meeting.
7. The following fully-developed project titled "Climate smart actions and strategies in north western Himalayan region for sustainable livelihoods of agriculture-dependent hill communities" was submitted by the National Bank for Agriculture and Rural Development (NABARD), which is the National Implementing Entity of the Adaptation Fund for India. This is the first submission of the proposal, using the one-step approval process. The submission was received by the secretariat in time to be considered in the twenty-third Board meeting.
8. The secretariat carried out a technical review of the project proposal, assigned it the diary number IND/NIE/Agri/2014/2, and completed a review sheet. In accordance with a request to the secretariat made by the Board in its tenth meeting, the secretariat shared this review sheet with NABARD, and offered it the opportunity of providing responses before the review sheet was sent to the PPRC.

9. The secretariat is submitting to the PPRC the summary and, pursuant to Decision B.17/15, the final technical review of the project, both prepared by the secretariat, along with the final submission of the proposal in the following section.

Project Summary

India – Climate smart actions and strategies in north western Himalayan region for sustainable livelihoods of agriculture-dependent hill communities

Implementing Entity: *NABARD*

Project/Programme Execution Cost: USD 54,366

Total Project/Programme Cost: USD 571,877

Implementing Fee: USD 48,610

Financing Requested: USD 620,487

Programme Background and Context:

The proposed project seeks to introduce a combination of multi-sectoral climate smart technologies and processes in mountain conditions to foster climate change adaptation by small and marginal farmers and vulnerable groups, especially hill women who are dependent on agriculture. The specific objectives include: enhancing resilience of mountain communities and their livelihood support systems by building local level institutions and their capacity building; enhancing disaster preparedness of the hill community through vulnerability assessment and timely dissemination of weather information; demonstration of context specific technology packages for adoption of climate smart agri-practices and innovations combining suitable sectoral interventions on farmers' fields and community land; and to generate evidence, livelihood gains and replication opportunities.

Component 1: Informed participation and participatory actions for planned adaptation by agriculture dependent hill communities (US\$ 58,990)

Key actions within this component include: participatory processes for baseline studies and sectoral vulnerability assessments, prioritisation of needs and climate smart interventions, study of climate change scenarios, risk mapping and socio-economic impact assessments; activities relating to rapport building and awareness building to strengthen the local institutional base; linking development with local scientific and research institutes and introduction of climate-smart agricultural technologies; planning a disaster preparedness strategy; and various capacity building initiatives at the community level.

Component 2: Introducing suitable combination of interwoven climate smart interventions by blending Science and Technology inputs and by focusing important livelihood support systems at household and landscape level in a cluster of 10 villages (US\$ 442,025)

Key actions in this component include: conservation and revival of diverse, native and sturdy agro-biodiversity resources; the promotion of niche crops that are adaptive to changing temperature and rainfall patterns; the promotion of protective cultivation and tree fodder on private and community lands and the promotion of climate smart management of agriculture.

Component 3: Knowledge generation, management and knowledge dissemination (US\$ 16,495)

The objective of this component is to support a robust programmatic approach, which can generate learnings, policy inputs and replication opportunities. Thus knowledge, data and strategies developed during the course of implementation on climate change adaptation under the 'Hill Context' will be appropriately documented and disseminated.



ADAPTATION FUND

ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: Small-sized Project

Country/Region: **India**
 Project Title: **Climate smart actions and strategies in north western Himalayan region for sustainable livelihoods of agriculture-dependent hill communities**
 AF Project ID: **IND/NIE/Agri/2014/2**
 NIE/MIE Project ID: Requested Financing from Adaptation Fund (US Dollars): **620,487**

Reviewer and contact person: **Daniel Gallagher** Co-reviewer(s): **Ulrich Apel**
 NIE/MIE Contact Person: **Shri. Sanjay Kumar Dora**

Review Criteria	Questions	Comments 1 Feb 2014	Comments 21 Feb 2014
Country Eligibility	1. Is the country party to the Kyoto Protocol?	Yes	
	2. Is the country a developing country particularly vulnerable to the adverse effects of climate change?	Yes	
Project Eligibility	1. Has the designated government authority for the Adaptation Fund endorsed the project/programme?	Yes	

	<p>2. Does the project / programme support concrete adaptation actions to assist the country in addressing adaptive capacity to the adverse effects of climate change and build in climate resilience?</p>	<p>Partially. The proposed project supports a number of concrete adaptation activities but at the same time includes several activities that address standard sustainable land management and forest management interventions without a clear link to increasing adaptive capacity of smallholders. There are a large number of project components that are not reported consistently throughout (e.g. 10 components on pages 14-15, six components on page 19, eight sectors on pages 20-25).</p> <p>CAR1: Please consider refocusing the proposed project activities into a reduced number of components and demonstrate the clear link that they have with increasing the adaptive capacity of targeted households. Please report the components consistently throughout the proposal.</p> <p>CR1: Please provide a detailed explanation of the SMS-based early warning system including who will operate the system, what costs will be incurred by users and operators, what information it will disseminate in practice and how this represents</p>	<p>CAR1: Not addressed.</p> <p>The revised proposal is more focussed on specific activities that build adaptive capacity, in parts, but the number of components presented throughout and in the budget the document is not consistent.</p> <p>CR1: Addressed.</p> <p>Further information is provided on existing arrangements and how the new system will provide climate advisory messages.</p>
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		an improvement in climate preparedness as compared to how weather information is presently disseminated.	
	3. 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 of the Fund?	<p>Yes, the proposed project will deliver benefits to 800 households of small and marginal farmers, including hill women and their families, in 10 villages. However, the proposal makes reference to a list of villages in Annex 1 which is not provided in the proposal.</p> <p>CR2: Please provide information on the villages where the project intends to target its activities, and a description of how the project beneficiaries will be selected.</p>	CR2: Addressed

	4. Is the project / programme cost effective?	<p>Potentially. The proposed activities are low-cost in nature, but the lack of information on their scale and extent precludes an assessment of cost-effectiveness. The information provided in the budget lacks descriptive budget notes and is not fully consistent with the described activities (e.g. climate-smart housing described on p.14 does not appear in the budget on p.53)</p> <p>CR3: Please provide a description of the scale and extent of the proposed activities and ensure that the budget is consistent with the activities proposed. Detailed budget notes should be provided.</p>	<p>CR3: Not addressed.</p> <p>The budget is not consistent with the proposed activities and the budget notes do not correspond to the numbered items in the budget.</p>
	5. Is the project / programme consistent with national or sub-national sustainable development strategies, national or sub-national development plans, poverty reduction strategies, national communications and adaptation programs of action and other relevant instruments?	<p>Yes, the project objective and activities appear well aligned with the relevant national and sub-national policies.</p>	

	6. Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund?	CR4: Under the proposed activity focusing on revival and conservation of agro-biodiversity, please clarify the intended use of <i>Bhang</i> and whether the project has sought the relevant government permits for cultivation of this crop.	CR4: Addressed. No government permits are required for cultivation of the crops contained in the proposed activities.
	7. Is there duplication of project / programme with other funding sources?	CR5: Please clarify whether synergies are sought with initiatives financed by multilateral and bilateral donors, such as the Himalayan Climate Change Adaptation Programme (HICAP) financed by the Ministry of Foreign Affairs, Norway and the Indian Himalayas Climate Adaptation Programme (IHCAP) financed by the Swiss Agency for Development and Cooperation.	CR5: Not addressed. Information provided on synergies with other initiatives has not been incorporated into the proposal document.

	<p>8. Does the project / programme have a learning and knowledge management component to capture and feedback lessons?</p>	<p>Yes, but the design of the knowledge management component is not described in detail and the funding allocated to this component is very small (US\$ 7,000).</p> <p>CR6: Please provide further information on how the project will systematically keep track of experiences gained, analyse them periodically and disseminate them in an effective manner that enriches the global, national and local knowledge on climate change adaptation.</p>	<p>CR6: Addressed</p> <p>A knowledge management strategy has been included.</p>
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	<p>9. Has a consultative process taken place, and has it involved all key stakeholders, and vulnerable groups, including gender considerations?</p>	<p>Yes, a one day exercise was undertaken followed by a visit, in which 26-30 villagers from 8 villages participated in discussions. It is not clear if wide consultation has taken place with all project stakeholders and whether the targeted households participated in the choice of activities proposed through the project.</p> <p>CR7: Please provide further details on the consultative process including information on all stakeholder groups consulted. Please clarify if the targeted households participated in the choice of activities proposed through the project and demonstrate alignment between the proposed activities and the priority needs identified by households.</p>	<p>CR7: Partially addressed.</p> <p>A more thorough consultative process would have been expected at the full proposal stage in order to ensure that there is a clear link between the needs identified at the community level and alignment of the proposed activities with the perceived vulnerability to future climate change.</p>
	<p>10. Is the requested financing justified on the basis of full cost of adaptation reasoning?</p>	<p>This can be better assessed after re-focusing the project activities on adaptation (see CAR1).</p> <p>CR8: Please provide a concise overall justification for the funding requested by demonstrating how, taken together, the project activities serve to meet the adaptation needs of the target population.</p>	<p>CR8: Not addressed.</p> <p>The inconsistency in the presentation of the components and activities precludes an assessment of justification of the activities.</p>

	<p>11. Is the project / program aligned with AF's results framework?</p>	<p>This section is not completed correctly. The guidance document on results provides the Adaptation Fund's results framework on pages 5-6 of the following document:</p> <p>http://goo.gl/q5amIB</p> <p>CR9: Please indicate how the project aligns with the results framework of the Adaptation Fund making sure to specify the outcomes, outputs and relevant indicators provided in the guidance document provided to proponents.</p>	<p>CR9: Not addressed.</p> <p>The activities broadly align with the Adaptation Fund results framework, but the framework made available to proponents has not been used to demonstrate the requested alignment.</p>
	<p>12. Has the sustainability of the project/programme outcomes been taken into account when designing the project?</p>	<p>To some extent. The financial sustainability of project outcomes is predicated on the "convergence of existing projects/programmes" under various government departments and attracting "mainstream funding for future replication", yet the means for achieving this in practice is not discussed.</p> <p>CR10: Please provide further detail on how the financial sustainability of the project outcomes will be ensured beyond the project duration, including how government departments will be engaged in replicating</p>	<p>CR10: Partly addressed.</p> <p>Some efforts are made to "attract mainstream funding in the longer run" but the proposal should address how the public and private</p>

		successful initiatives and the potential sources of funding for doing so.	sectors (if relevant) will be engaged in replicating successful initiatives and the potential sources of funding.
	13. Does the project / programme provide an overview of environmental and social impacts / risks identified?	Yes. CR11: Please clarify whether there are any scheduled tribes or castes in the project area that may be considered relevant to the provision on indigenous people in the Environmental and Social policy of the Adaptation Fund.	CR11: Addressed.
Resource Availability	1. Is the requested project / programme funding within the cap of the country?	Yes	
	2. Is the Implementing Entity Management Fee at or below 8.5 per cent of the total project/programme budget before the fee?	No. The Implementing Entity management fee is 9.2 per cent of the total project cost. CAR2: Please reduce the Implementing Entity management fee to a maximum of 8.5 per cent of the total project budget.	CAR2: Addressed.
	3. Are the Project/Programme Execution Costs at or below 9.5 per cent of the total project/programme budget (including the fee)?	Yes	
Eligibility of NIE/MIE	4. Is the project/programme submitted through an eligible NIE/MIE that has been accredited by the Board?	Yes	

Implementation Arrangements	1. Is there adequate arrangement for project / programme management?	CR12: Please describe the roles and responsibilities of NABARD as the Implementing Entity and those of all the executing entities (such as BIRD-UP and BAIF). The implementation and execution arrangements could be made clearer by providing a detailed organization chart and more information on each entity such as whether it is governmental or non-governmental in nature and whether there are any existing institutional relationships between entities.	CR12: Partly addressed. The information provided has clarified to some degree the role of NABARD vis a vis the executing entities but there is no clear discussion on the arrangements for reporting to NABARD by the executing entities and how adequate supervision will be exercised.
	2. Are there measures for financial and project/programme risk management?	Yes	

	<p>3. Are there measures in place for the management of for environmental and social risks, in line with the Environmental and Social Policy of the Fund? Does the proposal describe how the Implementing Entity will ensure that executing entities are fully aware of their responsibilities with regards to the provisions of the Environmental and Social Policy of the Adaptation Fund, including the promotion of human rights, where applicable, and how the executing entities and direct beneficiaries are made aware of the grievance mechanism available in the country and of the complaint handling mechanism of the Fund, in case of non-compliance?</p>	<p>Unclear. Some general information is provided on the approach towards project activities but not a description of the management of environmental and social risks.</p> <p>CR13: Please identify all major environmental and social risks, consider their significance, and include a plan of monitoring and mitigating them.</p> <p>CR14: Please clarify how NABARD would ensure that executing entities are fully aware of their responsibilities with regards to the provisions of the Environmental and Social Policy of the Adaptation Fund, including the promotion of human rights, where applicable, and how the executing entities and direct beneficiaries would be made aware of the grievance mechanism available in the country and of the complaint handling mechanism of the Fund, in case of non-compliance.</p>	<p>CR13: Addressed.</p> <p>The activities pose low risk and the proposal describes how risks will be mitigated.</p> <p>CR14: Addressed.</p> <p>NABARD would provide an orientation and guidance during the inception workshop to create awareness of the responsibilities in regards to the Environmental and Social Policy of the Fund, as well as making clear to communities the existence and function of the grievance mechanism.</p>
	<p>4. Is a budget on the Implementing Entity Management Fee use included?</p>	<p>No.</p> <p>CAR3: Please provide a budget on the proposed use of the Implementing Entity Management Fee.</p>	<p>CAR3: Not addressed.</p> <p>No budget on the IE management fee is provided in the proposal document.</p>

	5. Is an explanation and a breakdown of the execution costs included?	CAR4: Please provide an explanation and a breakdown of the execution costs.	CAR4: Not addressed. Explanation on execution costs not provided in proposal document.
	6. Is a detailed budget including budget notes included?	No budget notes are provided.	
	7. Are arrangements for monitoring and evaluation clearly defined, including budgeted M&E plans and sex-disaggregated data, targets and indicators?	CAR5: Please provide a budgeted monitoring and evaluation plan, in compliance with the Adaptation Fund's guidelines on monitoring and evaluation made available to project proponents.	CAR5: Partly addressed. A budgeted monitoring plan is provided but most items have been budgeted at zero cost, without an explanation of the rationale for this.
	8. 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?	No M&E framework is provided (see CAR5 above)	
	9. 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?	Not demonstrated (see CR8 above)	
	10. Is a disbursement schedule with time-bound milestones included?	CAR6: Please provide a disbursement schedule in the format requested in the submission template. https://www.adaptation-fund.org/page/disbursement-schedule-template	CAR6: Addressed.

<p>Technical Summary</p>	<p>The initial technical review found that the proposed project targeted households in a mountainous area vulnerable to climate change and clearly articulated the climate impacts affecting poor and marginalised communities living in mountain regions of the north-western Himalayan Region. However, it found that the project design could benefit from being better focused on delivering adaptation activities that have a clear link to improving the adaptive capacity of targeted households.</p> <p>The following <u>five corrective action requests (CARs)</u> were made:</p> <p>CAR1: Please consider refocusing the proposed project activities into a reduced number of components and demonstrate the clear link that they have with increasing the adaptive capacity of targeted households. Please report the components consistently throughout the proposal.</p> <p>CAR2: Please reduce the Implementing Entity management fee to a maximum of 8.5 per cent of the total project budget.</p> <p>CAR3: Please provide a budget on the proposed use of the Implementing Entity Management Fee.</p> <p>CAR4: Please provide an explanation and a breakdown of the execution costs.</p> <p>CAR5: Please provide a budgeted monitoring and evaluation plan, in compliance with the Adaptation Fund's guidelines on monitoring and evaluation made available to project proponents.</p> <p>CAR6: Please provide a disbursement schedule in the format requested in the submission template.</p> <p>In addition, the following <u>13 clarification requests (CRs)</u> were made:</p> <p>CR1: Please provide a detailed explanation of the SMS-based early warning system including who will operate the system, what costs will be incurred by users and operators, what information it will disseminate in practice and how this represents an improvement in climate preparedness as compared to how weather information is presently disseminated.</p> <p>CR2: Please provide information on the villages where the project intends to target its activities, and a description of how the project beneficiaries will be selected.</p> <p>CR3: Please provide a description of the scale and extent of the proposed activities and ensure that the budget is consistent with the activities proposed. Detailed budget notes should be provided.</p>
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CR4: Under the proposed activity focusing on revival and conservation of agro-biodiversity, please clarify the intended use of *Bhang* and whether the project has sought the relevant government permits for cultivation of this crop.

CR5: Please clarify whether synergies are sought with initiatives financed by multilateral and bilateral donors, such as the Himalayan Climate Change Adaptation Programme (HICAP) financed by the Ministry of Foreign Affairs, Norway and the Indian Himalayas Climate Adaptation Programme (IHCAP) financed by the Swiss Agency for Development and Cooperation.

CR6: Please provide further information on how the project will systematically keep track of experiences gained, analyse them periodically and disseminate them in an effective manner that enriches the global, national and local knowledge on climate change adaptation.

CR7: Please provide further details on the consultative process including information on all stakeholder groups consulted. Please clarify if the targeted households participated in the choice of activities proposed through the project and demonstrate alignment between the proposed activities and the priority needs identified by households.

CR8: Please provide a concise overall justification for the funding requested by demonstrating how, taken together, the project activities serve to meet the adaptation needs of the target population.

CR9: Please indicate how the project aligns with the results framework of the Adaptation Fund making sure to specify the outcomes, outputs and relevant indicators provided in the guidance document provided to proponents.

CR10: Please provide further detail on how the financial sustainability of the project outcomes will be ensured beyond the project duration, including how government departments will be engaged in replicating successful initiatives and the potential sources of funding for doing so.

CR11: Please clarify whether there are any scheduled tribes or castes in the project area that may be considered relevant to the provision on indigenous people in the Environmental and Social policy of the Adaptation Fund.

CR12: Please provide more detailed information on the executing entities, specifically if BIRD-UK is a government organization and its relation to BAIF-UP. Please also include NABARD, as Implementing Entity, in the discussion on implementation arrangements and explain the arrangements for its oversight and supervision of the project.

CR13: Please identify all major environmental and social risks, consider their significance, and include a plan of monitoring and mitigating them.

CR14: Please clarify how NABARD would ensure that executing entities are fully aware of their responsibilities with regards to the provisions of the Environmental and Social Policy of the Adaptation Fund, including the promotion of human rights, where applicable, and how the executing entities and direct beneficiaries would be made aware of the grievance mechanism available in the country and of the complaint handling mechanism of the Fund, in case of non-compliance.

The final technical review finds that the additional information provided in the revised proposal has clarified a number of issues identified in the initial technical review. However, there are inconsistencies throughout the proposal document and a number of issues remain. The following observations are made:

- i. The proposal should report the proposed components and activities consistently throughout the document and ensure that the budget provided aligns with the proposed activities.
- ii. The proposal should describe how synergies are sought with initiatives financed by multilateral and bilateral donors, such as the Himalayan Climate Change Adaptation Programme (HICAP) financed by the Ministry of Foreign Affairs of Norway and the Indian Himalayas Climate Adaptation Programme (IHCAP) financed by the Swiss Agency for Development and Cooperation.
- iii. The proposal should consider undertaking further consultation to ensure that all relevant stakeholder groups, particularly vulnerable communities, are consulted and that the targeted households are given the opportunity to make clear their priority needs with respect to climate change as well as participate in the choice of activities proposed through the project.
- iv. The proposal should present clear information on the implementation arrangements including NABARD's oversight of the project, the mechanisms through which executing entities are expected to report to NABARD. Budgets on the implementing entity management fee, execution costs and monitoring and evaluation should be provided in the proposal document with justification for the requested amounts.

Date: 21 February 2014



ADAPTATION FUND

**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 Adaptation Fund Board Secretariat
1818 H Street NW
MSN P4-400
Washington, D.C., 20433
U.S.A
Fax: +1 (202) 522-3240/5
Email: afbsec@adaptation-fund.org



ADAPTATION FUND

PROJECT/PROGRAMME PROPOSAL TO THE ADAPTATION FUND

PART I: PROJECT/PROGRAMME INFORMATION

Project/Programme Category:	SMALL- SIZED PROJECT
Country/ies:	INDIA
Title of Project/Programme:	CLIMATE SMART ACTIONS AND STRATEGIES IN NORTH WESTERN HIMALAYAN REGION FOR SUSTAINABLE LIVELIHOODS OF AGRICULTURE DEPENDENT HILL COMMUNITIES
Type of Implementing Entity:	NIE
Implementing Entity:	NATIONAL BANK FOR AGRICULTURE AND RURAL DEVELOPMENT (NABARD)
Executing Entity/ies:	BAIF INSTITUTE OF RURAL DEVELOPMENT – UTTARAKHAND (BIRD- UK)
Amount of Financing Requested:	US \$ 6,20,487 (in U.S Dollars Equivalent)

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.

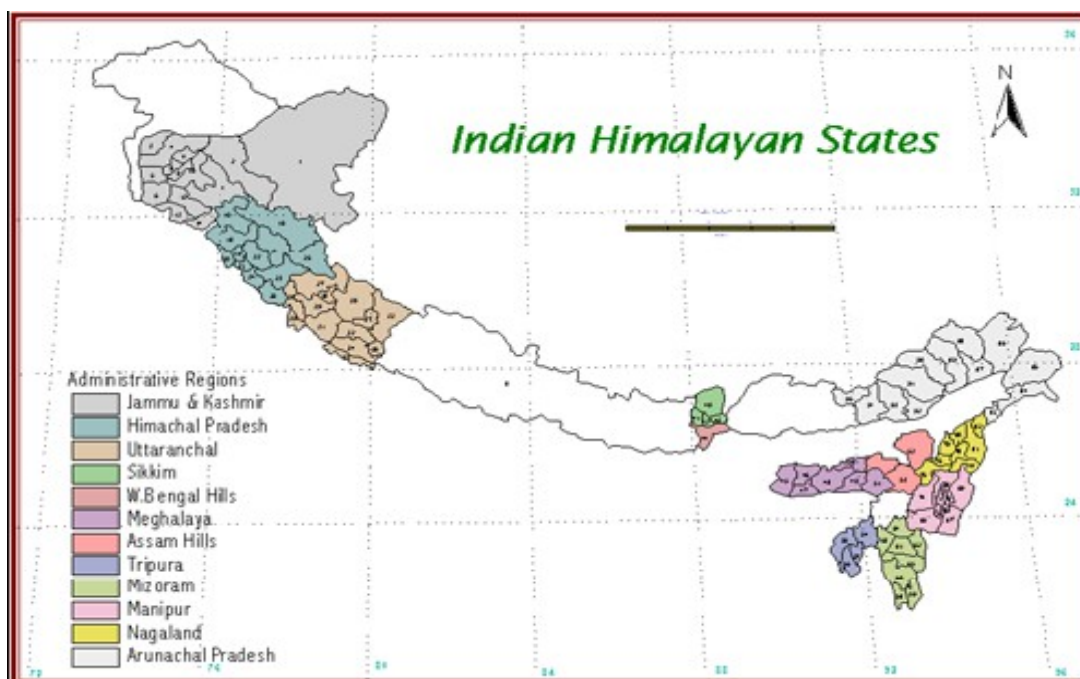
1. The Country Context :

Climate change is not only a major global environmental problem, but it is also an issue of great concern to a developing country like India. Climate has played significant role in the economic development of India. India has tremendous reasons to be concerned about the impacts of climate change. Its large population depends on climate-sensitive sectors like agriculture and forestry for livelihoods. Indian agriculture is particularly sensitive to climate change and variability.

2. Indian Himalayan Region (IHR) Environment and Context:

Mountains are amongst the most sensitive regions to climate change. The sensitive position of mountains has been clearly identified in recent IPCC reports. The proposed project envisages Sustainable livelihood focused climate smart actions and strategies for marginalized communities in Indian Himalayan Region (IHR),which forms an important part of Indian sub continent.

Fig 1: Indian Himalayan States



Source: State Action Plan on Climate Change- Uttrakhand

The region needs urgent attention of development planners for multiple reasons including growing threat of climate change issue. Some of these reasons are indicated below:

The IHR exerts a considerable influence on weather patterns throughout the South Asia. Sustainability of the Himalayan Ecosystems is crucial for the livelihood of about 1.3 billion people in Asia. The region has 69% of India's freshwater resources. Some of the Asia's mighty rivers namely Indus, Sutlej, Ganges, and Brahmaputra and their numerous tributaries flow through these ranges, which supports many civilizations. The IHR represent highly fragile and vulnerable **Mountain Ecosystems** in the country. The entire Indian Himalayan Region is recognized as one of the important global 'Biodiversity Hotspots'. Indian Himalayan Region is home to nearly 50 million population and is identified as one of the most fragile and vulnerable eco-systems in the world.

3. Problem Statement

Observed Climate trends over Himalayan region

Knowledge of the climate system, together with model simulations, confirms that past changes in greenhouse gas concentrations will lead to a committed warming and future climate change

because of the long response time of the climate system, particularly the oceans. Committed climate change due to atmospheric composition in the year 2000 corresponds to a warming trend of about 0.1°C per decade over the next two decades i.e. up to 2020's.

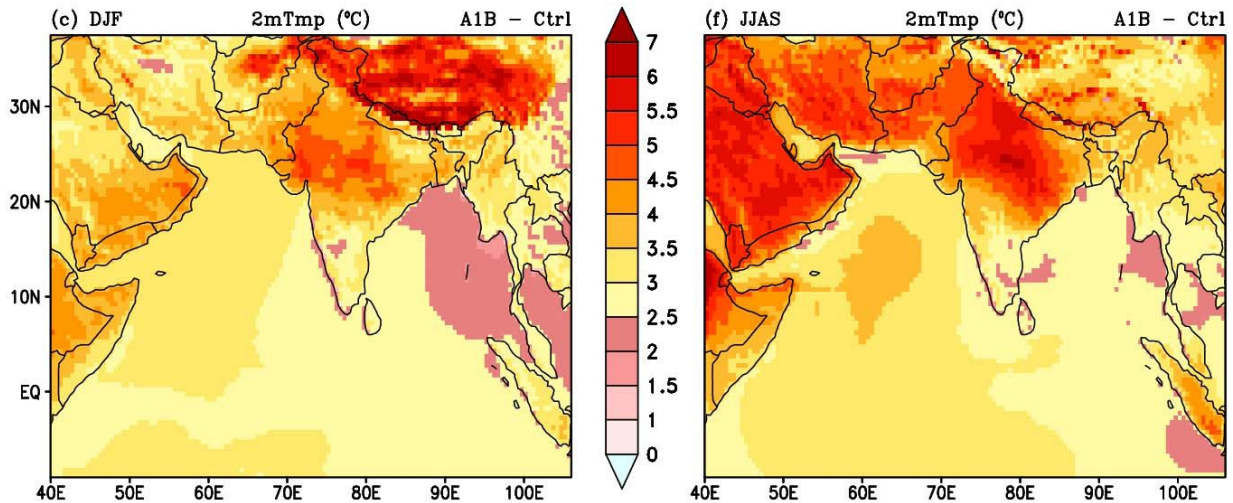
As per the fourth assessment report of IPCC (2007), climate change and variability are posing greatest challenge to Indian Himalayan Region and is adversely affecting livelihoods of communities in this region. Climate risks are increasing in this region of India. This is evident from growing instances of climate related events.

Several studies by national and international experts support that mountains in India are most susceptible to climate change, which is now emerging as a major threat to food security and livelihood support systems in these areas. On the basis of observed patterns, the Indian Network for climate change assessment (INCCA) has identified that among all the major regions of the country, the Himalayan region is the most vulnerable to climate change which have direct bearing on natural Eco-systems and rural livelihoods. Communities inhabiting mountain ecosystems are particularly vulnerable to extreme weather conditions such as high temperatures, altering rainfall patterns, receding glaciers and permafrost thawing. Several models predict rising temperatures, increased climatic variability and extreme weather event in this part in next few years.

4×4 Assessment Report on sectoral and regional analysis for 2030s', prepared by the Indian Network for Climate Change Assessment (INCCA) provides an assessment of impacts of climate change by 2030s on four key sectors of the Indian economy, viz. Agriculture, Water, Natural Ecosystems & Biodiversity and Health in four climate sensitive regions of India, namely the Himalayan region, the Western Ghats, the Coastal Area and the north east region.

The Indian Institute of Tropical Meteorology analyzed rainfall data of over 50 years and found that frequency of extreme rainfall event is increasing in this part of India. Glaciers of the Himalayas are observed to be receding. This will increase the flow of water in rivers originating from the Himalayas and be a cause of flash floods in the plains.

Figure 2. Temperature projection over India for the 2070-99 for the months of a) December, January & February, b) June, July & August.



As per the 4 X 4 assessment by MoEF the projection/forecast of climate change on Himalayan Region is summarized below:

The annual temperature is forecasted to increase from 0.9 ± 0.6 °C to $.6 \pm 0.7$ °C in 2030's. The net increase in temperature is ranging from 1.7°C to 2.2°C with respect to the 1970's. Seasonal air temperatures are also forecasted to rise in all seasons. However, winter temperatures during October, November and December are likely to decrease by 2.6°C in 2030's with respect to 1970's. As per the 4X4 Assessment, the annual rainfall in the Himalayan region may vary between 1268 ± 225.2 mm to 1604 ± 175.2 mm respectively. The forecasted precipitation show a net increase in 2030's with respect to the simulated rainfall of 1970's in the Himalayan region by 60 to 206 mm. The increase in annual rainfall in 2030's with respect to 1970's ranges from 5 to 13%. All seasons in the Himalayan region are forecasted to have an increase in rainfall, with the monsoon months of June, July, August and September are forecasted to have the maximum increase in rainfall by 12 mm. The winter rain in the months of January and February are also forecasted to increase by 5mm in 2030's with respect to 1970's, with minimum increase in October, November and December. The Himalayan region is mainly fed by the Indus river system. The whole area is expected to an increase in the precipitation in the 2030s scenario (**PRECIS simulations**).

According to the State Action Plan for Climate Change for Uttarakhand, climate change induced changes are already being experienced which include: receding glaciers and upwardly moving snowline, depleting natural resources, erratic rainfall, irregular winter rains, advancing cropping

seasons, fluctuations in the flowering behavior of plants, shifting of cultivation zones of apple and other crops, reduction in snow in winter, rise in temperature, increasing intensity and frequency of flash floods, drying up of perennial streams, etc. The recent devastation in the State has largely been attributed to the incidence of flash floods resulting from heavy (64.5mm-124.4mm) to very heavy rains (124.5mm–244.4mm) experienced on 16 and 17 June 2013 in several parts of the State including cloud burst in the Kedarnath area. According to the Indian Meteorological Department, Uttarakhand received 324 mm of rainfall, 847% of normal (34mm) during the week 13-19 June 2013. Besides the quantum of rainfall experienced, a huge quantity of water was probably released from melting of ice and glaciers due to high temperatures during the months of May and June 2013.

As per projected changes under A2 scenario (Khaladkhar et.al (2009) vis-a-vis temperature, the annual mean temperature is projected to increase by 1.65 degree C by 2030, and 3.0 degree C by 2050. Annual total precipitation is projected to increase by a negligible amount by 2050 under A2 scenario.

In an another study, the climatic conditions for the entire India have been projected for the 2070-99 by a team of scientists at **Max Plank Institute of Meteorology**, Germany using General Circulation Model (GCM). The model output shows that precipitation over different parts of Uttarakhand is supposed to decrease by 15- 50 % during rabi season (December to February), however the decrease in precipitation is not that much prominent in kharif season (June to August), where it is supposed to decrease by 0-15 %.

Table 1 : Projected Climate Change Parameters

Projected Climate Change Parameters in 2030s with respect to 1970s

Features	Himalayan region	Western Ghats	Coastal Region	North-Eastern Region
Temperature	↑	↑	↑	↑
Precipitation	↑	↑	↑	↑
Extreme Temperature	↑	↑	↑	↑
Extreme Intensity Precipitation	↑	↑	↑	↑
No. of Rainy days	↑	↓	↑	↓

Key

↑ increase ↗ Slight increase → No change ↓ decrease ⇕ No particular trend

Source: SAPCC-Uttarakhand

The above table predicts likely shifts in main weather parameters in Himalyan Region.

As per the Annual report of **Uttarakhand Organic Commodity Board**, it is also noted that:

- ◆ Peak rainfall is shifting from the mid July to mid August.
- ◆ The total number of rainy days is shrinking.
- ◆ During rabi season, rainfall was erratic/ negligible over the years.
- ◆ Peak rainfall in rabi season is shifting towards harvesting season

4. CLIMATE CHANGE IMPACTS:

Level of vulnerability and level of urgency and risks anticipated from delay in actions: It has been reported in the SAPCC for Uttarkhand that climate change is likely to escalate the already existing vulnerabilities (social, ecological, economic and cultural). It further warns that it could manifest disastrously, if not addressed adequately. The climate change will have differentiated impacts on sections of population, and that impact could be more severe for women, and poor and marginalized groups residing in mountains. The above backdrop highlights need for quick response and urgent actions by all concerned to enable better transformation of entire development efforts in mountains which will result in to building resilience of hill communities and their livelihood resources. The actions taken over the next 10 years will be especially critical.

Sectoral implications of growing climate risks in Himalayan region: Past decade has seen increase in the recurrence of natural hazards in Indian Mountains (Himalayan Ranges) , which have adversely affected the livelihoods of the local people in hills, with far reaching implications at local, regional level. The devastation to livelihood support systems is likely to continue with increased frequency of such events as indicated in recent report of MoEF, GoI on Himalyan region. Increase in ambient temperature is seen to have strong influence on local weather pattern. It is predicted that there would be an upward shift in various climatic zones with slight rise in temperature. Also, there is increasing evidence that winter precipitation in the form of snow fall has declined over the years. According to the Indian Meteorological Department (IMD), June 2013 rainfall was over thrice the normal amount. Under the changed precipitation conditions, leading to increased run-off and less infiltration; coupled with removal of forest cover, has already started showing signs of depleted hill aquifer regimes in the IHR. Availability of water has been badly affected by change in climatic conditions in the mountain regions. Many regions which used to get good snowfall earlier are reported to be receiving slight or absolutely no snowfall. There is an increase in the intensity of precipitation as well as temperature due to which surface run off is very high and groundwater do not get recharged properly. Surface water also evaporates at a faster rate. Deforestation has played a catalytic role in this process. Due to this phenomenon, there is abundance of water in most of the area in rainy season which is followed by long dry season leading to acute scarcity.

Realizing the need for taking urgent action on account of climate change impacts on mountain ecosystems and livelihoods of mountain community, Planning Commission (PC) of India during the XIth Five Year Plan have formed a special Task Force. With the formulation of a national policy on climate change, it has become imperative to achieve coherence between strategies and actions at national and State levels.

The study conducted by **International Centre for Integrated Mountain Development and International Fund for Agricultural Development** has documented people's perceptions of

how climate change impacted their immediate surroundings and livelihoods. Several other documents on Indian Himalayan Region have elaborated the changes in climatic factors in IHR during the past few decades. An attempt has been made to present the growing vulnerability of hill communities due to adverse effects of climate change and the same is summarized in the table given below.

Table 2: Adverse Effects due to Specific Climate Change Stimuli

Specific climate changes	Specific adverse effects	
<p>Raising temperature</p> <p>The region has experienced an increase in maximum temperature up to 1 degree Centigrade</p>	<ol style="list-style-type: none"> 1. Apple orchards shifting towards higher altitude seeking lesser temperatures 2. Increased vulnerability of agri-horti sectors and absence of any other livelihood options leading to migration of productive labor. 3. Upward shift in various climatic zones with slight rise in temperature 4. Altered cropping pattern 5. Day-to-day and medium-term planning of farm operations is becoming more difficult 6. Greater losses in rabi as compared to kharif season 7. Changes in phenology/composition of species 8. Increase in pests and diseases 9. Decline in the production of wheat and potato and consequent adverse impact on food security. 10. Degradation of soil and declining soil moisture due to increased heat stress and early snow melting. 11. Decline in availability of fodder and its adverse impact on animal husbandry. 12. Reduction in local crop diversity. 	
<p>Changed precipitation conditions</p> <p>Winter precipitation in the form of snow fall has declined over the years</p> <p>Warmer and shorter winters with less snowfall</p> <p>Delayed onset of rains during monsoon</p> <p>Decrease in scattered light rainfall which was useful for percolation and an increase in intense rainfall which</p>	<ol style="list-style-type: none"> 1. Decrease in water availability in the streams and rivers in summer due to decreased snow fall. 2. Increased run-off, less in filtration and loss of surface soil on steeper mountain slopes which would accelerate the rates of siltation and flash floods. 3. Increased run-off coupled with removal of forest cover, has already started showing signs of depleted hill aquifer regime. 4. Overall decreased water availability 5. Streams and springs are drying up which used to act 	<p>Animal husbandry turning unproductive and less remunerative due to scarcity of fodder.</p>

<p>destroys crops and speeds up runs off.</p> <p>Overall less and more erratic rainfall.</p> <p>Less or absent winter rains</p> <p>Increased frequency of intense rainfall events</p>	<p>as the lifeline of the mountain communities by providing much needed water for drinking and agriculture during dry spells</p> <p>6. Decline in soil moisture hampering crop cultivation</p>	
		<p>Water availability becoming crucial issue posing challenge to agriculture and livestock.</p> <p>Drinking water sources are getting reduced thus adding to drudgery of women</p>
Extreme weather events	<p>⇒ Intense rainfall coupled with deforestation, slopy terrain and loose soil leading to soil erosion and loss of fertile soil, thereby making agriculture impossible.</p> <p>⇒ Land degradation and loosening of soil</p>	
Sudden events leading to total loss	<p>⇒ Sudden weather events like hail storm in 2009 and resultant crop losses.</p> <p>⇒ Cloud burst in June 2013, resulting in major devastation.</p> <p>⇒ Increased instances of landslides compared to the past.</p>	
‘Land and soil degradation due to intense rains ,temperature variations	<p>⇒ Increase in human-animal conflicts.</p> <p>⇒ Increased pressure on forests resulting into decline of biodiversity.</p> <p>⇒ Proliferation of invasive species.</p> <p>⇒ increased requirement for feed supplements for livestock.</p> <p>⇒ Fodder scarcity and resultant drudgery for women due to less fodder</p>	

5. Socio-Economic Context

Within Indian Himalayan Region (IHR), the **North West Himalayas** comprises of States like Jammu and Kashmir, Himachal Pradesh and Uttarakhand having unique set of agro ecological features and socio-economic conditions. The region, being situated centrally in the long sweep of the Himalaya, forms a transitional zone between the per-humid eastern and the dry to sub-humid western Himalaya. This zone has highly fragile ecosystem as it houses largest glaciers and India’s biggest rivers like Ganga and Yamuna.

The Central and Western Himalayan region is one such niche region, having its unique set of agro-ecological conditions and socio-economic setting. This region requires specific development interventions. Communities here try to create livelihood opportunities in difficult terrain with dwindling resource base. Economic security is the major concern for mountain people.

Uttarakhand has acute water scarcity, both for drinking as well as for irrigation. The recent years have witnessed increased scarcity of water as the natural springs started drying. Increased loss of top-soil (soil erosion) combined with a drop in already poor irrigation facilities have affected agriculture and the large population dependent on it. Further, it has added to the plight of the women for whom natural water sources provide water for daily household use.

Project Location: The project actions are proposed in select cluster of Champawat district in Kumaon region. The district is located in Zone B, having 1000-1500 mm rainfall. The Champawat district is identified as moderately vulnerable district in Uttarakhand as per SAPCC.

Fig. 3: Map indicating project location:



District Profile: Champawat is the most backward hill district of Uttarakhand and has the maximum area under hilly terrain. Only 8 per cent of the net cultivated area is irrigated. Agriculture including fruits and vegetables is the main economic activity. The land holdings are small and scattered thereby enhancing the vulnerability. Due to poor soil health and soil erosion, caused by heavy rainfall and landslides, productivity is affected. Krishi Vigyan Kendra (KVK) and soil testing facilities are available at Lohaghat. The district is rich in high-value medicinal plantations but cultivable land is limited. It has a suitable climate for tea plantation, sericulture

and floriculture, but storage facilities are a problem. For dairy development, there is shortage of green fodder and feed due to which milk yield is low.

Other challenges in a district:

- Fragility of ecosystems, steep slopes and shallow soils in the hills leads to increased erosion leaving behind less productive soil for crop production.
- Small and scattered land holdings making agriculture economically nonviable. More than seventy percent of the land holding are less than one hectare in size and the average per-capita land holding is about 0.91 hectare.
- Less than 10% of the cultivated land is irrigated the rest is rain fed.
- Due to difficult terrain and fragile ecosystems there has been inadequate infrastructure development in the area.
- Continued vicious cycle of low production, low productivity, low input supply, low level of awareness of new technologies and inadequate extension support leaves the farmer practicing the inefficient farming operations.

Socio-economic constraints:

The communities residing in this part of country are found to be more vulnerable to climate change effects in view of large population depending on agriculture, excessive pressure on natural resources and poor coping mechanisms. Climate change has shown its ugly face in the form of natural calamities in the region. During the span of past 10-15 years, the region has experienced several alarming climate threats. The atmospheric temperature increase brought about by global climate change has resulted in the shift of monsoon pattern accompanied by an increase in intensity of rainfall and cloudbursts and heavy landslides during recent years (Sah and Mazari, 1998).

Agriculture and animal husbandry have been age old land use practices in this part of IHR. A considerable area here is under settled agriculture (terrace farming). Agriculture is dependent on natural resources like water and soil. Other important natural resources in this region are forests. The land holdings are small and fragmented, and irrigation facilities are limited. The region also suffers on account of heavy soil erosion and significantly lower yields as compared to the national average. The main crops grown in this part are rice, finger millet, wheat, potato, tomato, peas, cole crops, pulses, peach & plums. The agriculture in this part is mostly rain fed and irrigation coverage to total cultivated area is as low as 0.7%. Overall, this hill district is characterized by low productivity, shortage of inputs, and lack of marketing that have confined the villages to producing only for self-consumption. Remoteness and inaccessibility of hilly areas are also impeding factors to be able to achieve desired development.

Livestock rearing is another important source of livelihood and climate resilience in the region. Almost each household rears cattle or small ruminants for enhancing their income and ensuring food security. These animals are also back bone of the organic farming in the areas. Major

hurdles in transforming livestock rearing as main source of livelihood for small holders are lack of fodder (about 40%), poor management practices and low genetic potential. Besides that limited avenues for market & value addition are also some causes for lower return from livestock sector.

Climate change is gradually changing the ecological and socio economic landscape in this region. The communities here suffer from socio-economic marginality, inaccessibility, and lack of livelihood opportunities. A closer look at livelihood and natural resource status supports this fact. Renewable natural resources are continuously degrading (water scarcity, biodiversity loss & soil degradation). Food security is at stake- one third of the rural mountain population is vulnerable to food insecurity. Changing of temperature, rainfall pattern and shifting of pest to higher altitude is posing threat to traditional agriculture. Livelihoods of hill communities is badly affected due to change in the ecosystem. Apple trees are not surviving in areas which were giving bumper crop earlier, newer pests are emerging, rivers are drying up and changing pattern of rainfalls are some of the problems faced by farmers in this region. The frequency and intensity of extreme events is increasing.

Project beneficiaries:

The project will be implemented in 10 villages covering around 800 families and surrounding landscape of two blocks (Champavat and Pati) in Champavat district. The list of villages to be focused is attached as **Annexure 1**

The activities will be introduced at selected 800 households of small and marginal farmers ,including hill women and their families, who are preliminarily dependent on primary sectors for their livelihoods and who are more vulnerable to changing context of climate in north western Himalayan region.

The participants will be selected by the BAIF's field teams in consultation with Gram Sabhas. Efforts will be made to identify households especially women headed households dependent on agriculture and livestock for their livelihood.

Project / Programme Objectives:

List the main objectives of the project/programme.

Main Goal: To introduce a combination of multi-sectoral climate smart technologies and processes in mountain conditions to foster climate change adaptation by small and marginal farmers and vulnerable groups especially hill women who are dependent on agriculture.

This project is conceived as a holistic programme, interweaving mix of technologies at household level focusing important livelihood resources i.e Agri-horti-forestry and fodder, water resource, land and soil resources, livestock resource, energy and off-farm livelihood resources. Apart from this, required approaches and program strategies at land scape level and community level are also proposed.

Specific objectives:

- 1) To enhance resilience of mountain communities and their livelihood support systems by building local level institutions and their capacity building.
- 2) To enhance disaster preparedness of the hill community through vulnerability assessment and timely dissemination of weather information.
- 3) To demonstrate context specific technology packages for adoption of climate smart agri practices and innovations combining suitable sectoral interventions on farmers' fields and community land.
- 4) To conserve and use water judiciously through appropriate techniques and practices.
- 5) To develop a viable model of alternate source of income as to improve coping capacity.
- 6) To evolve a robust project approach in mountain context having ability to generate evidence, livelihood gains and replication opportunities.

Project / Programme Components and Financing:

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 term.

For 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 Outlay

SL No.	PROJECT COMPONENTS	OUTPUTS	EXPECTED OUTCOMES	Amount in US \$
1	Baseline studies	Site specific studies on participatory assessment of climate risks, vulnerabilities and future climate change scenarios, risk mapping, socio-economic impact assessment and listing adaptation measures	Baseline reports	680
2	Trainings and capacity building measures	Building adaptive capacities of communities and groups	Communities better equipped to face climate hazards in future	37,500
3	Formation and strengthening of local institutional base	Formation/strengthening of community based organisations at the field level like Self Help Groups (SHGs), Farmer's collectives, Commodity interest groups, Dairy groups etc.	Adaptive capacity of 800 small and marginal farmers in 10 villages will be improved	7,500
4	Disaster preparedness, contingency planning and best practice adoption	Weather forecast and advisory, likely effects on natural and human resources, early warning signals, village level seed banks, fodder banks and creation of knowledge platforms	Community fully prepared to face the disaster like cyclone, flood, drought etc	13,310
5	Climate smart agri practices and innovations	Introduction of niche fruit crops, innovative propagation, protected cultivation & fodder resource development	Fruit crops requiring low chilling conditions, techniques for propagation of saplings and protected cultivation of vegetables promoted so as to withstand climate variability.	153,430
6	Strategic water reserve creation	Rainwater harvesting, spring rejuvenation and storage techniques	Near year round assured availability of water for drinking and irrigation	215,800

7	Livestock and fodder development	Livestock resource centric climate smart interventions such as improved management, health care and climate smart housing	Better managed livestock resources as an income diversification option	72,795
8	Knowledge management, documentation and dissemination	Creation of field based evidence of climate resilient programme/ strategy in mountain ecosystems	Robust climate smart development approaches having mountain specificity, replicated under similar conditions.	16,495
11	Project/Programme Execution Cost			54,366
12	Total Project/Programme Cost			5,71,877
13	Project/Programme Cycle Management Fee			48,610
14	Amount of Financing Requested			6,20,487

Projected Calendar:

Indicate the dates of the following milestones for the proposed project/programme

MILESTONES	EXPECTED DATES
Start of Project/Programme Implementation	July 2014
Mid-term Review (if planned)	April 2016
Project/Programme Closing	March 2018
Terminal Evaluation	September 2018

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.

The approach of the proposed program is to facilitate site specific understanding on changing climate and it's sectoral effects and then introduce climate smart agriculture measures by blending science and technology inputs for the benefit of agriculture dependent hill communities which mostly includes hill women.

Studies support that strengthening adaptive capacities of farmers requires a variety of strategies ranging from diversification of production systems to improved institutional settings and enabling policies (Tubiello et al. 2008; Beddin)

Apart from these, useful interventions such as use of ICT tools for pro poor climate services are also proposed. Most of it will be done by developing proper linkages with existing technical and scientific institutes which are already operational in this regions.

Other important components include building adaptive capacity of local communities by forming and strengthening community based institutions, skill building and disaster preparedness planning .

The project thus proposes holistic approach in mountain ecosystem covering interwoven sectoral technologies as well as planning and undertaking required social processes in 10 villages for building climate resilient mountain communities, who are otherwise very vulnerable to changing climate conditions.

Table 6 : Intervention matrix

Problem category	Main issue as faced by hill communities	Effects	Suggested technology solutions	Linkage development with
Growing scarcity of water (surface and sub surface) for drinking and irrigation	<ul style="list-style-type: none"> - Drying up of springs - Abundance of water in most of the area in rainy season which is followed by long dry season leading to acute scarcity 	<ul style="list-style-type: none"> - Agriculture becoming gamble - Possibility of second crop is less - Manual 	<ol style="list-style-type: none"> 1. Recharging of Natural Springs- through site specific mechanical and vegetative measures 2. Revival of useful traditions such as kuhls 	CSWTRI – Dehradun IIT –Roorkee HESCO –

<p>purpose due to unseasonal , irregular, less consistent, unpredictable rains in hills</p>	<ul style="list-style-type: none"> - Non- creation long term water reserves and lack of efforts in diverting water from upper reaches to lower reaches - Erosion of traditional techniques and wisdom related to water conservation 	<p>watering for existing plantations</p> <ul style="list-style-type: none"> - Scarcity of crops and fodder - Adverse effects on animal husbandry 	<p>and gravity based water channelization siphons etc.</p> <ol style="list-style-type: none"> 3. Innovative rain water storage – In situ water conservation techniques 4. Roof top rain water harvesting. 5. Innovative water use efficiency demonstrations 	<p>Dehradun</p>
<p>Growing scarcity of fodder resources in hills</p>	<ul style="list-style-type: none"> - Fodder promotion (both trees and grasses) has not received much attention in spite of livestock as important livelihood. - Lack of good quality fodder germplasm - Lack of altitude wise model of year round fodder production (combining trees and grasses) - Lack of knowledge and skills for scientific management and preparation of fodder and feed at household level 	<ul style="list-style-type: none"> - Less than optimum production of cattle - Growing hardship of hill women and loss of productive labour - Increase in cost of production due to purchase of fodder from outside 	<ol style="list-style-type: none"> 1. Fodder development on community lands- vanpanchayat – suitable species demonstration 2. Vegetative propagation and household level nurseries of local fodder trees such as, Oak (<i>Quercus leucotrichophora</i>), Phalyant (<i>Quercus glauca</i>), Khadik (<i>Celtis australis</i>), Bheemal (<i>Grevia optiva</i>) 3. Community level nursery to produce quality seedlings of fodder trees & grasses like Napier, Red clover, White clover, Gucchi, Cox foot etc. 4. Fodder and feed preparation using innovative techniques 	<p>BAIF –CRS-Scientist</p> <p>Scientists from Livestock Development Board – Uttarakhand</p>

<p>Absence of optimum development of horticulture as a source of livelihood in spite of favorable conditions</p>	<ul style="list-style-type: none"> - Lack of quality germ plasm, seeds and other planting material for temperate horticulture (mainly fruits and vegetables and flowers) - Lack of timely availability of planting material - Lack of knowledge about after care and management under open and protected conditions (such as shade net and low cost poly houses) 	<p>Underutilized livelihood potential of horticulture sector</p>	<ol style="list-style-type: none"> 1. Community level nurseries of vegetable & fruit trees Ex: Peach (Red June, Red Heaven), Walnut, Apple (Spur varieties). 2. Innovative propagation and training for farmers for multiplication 3. Promotion of horticulture under protected conditions (shade net and low cost bamboo based, small poly houses). Main crop to be promoted under the protective cultivation will be vegetables (Tomato, Capsicum, Cucumber) and Flower (mainly Carnation). 	<p>VPKAS- Almora CITH – Mukteshwar University of Horticulture and forestry, Solan Pant nagar university – KVK Champavat CSK –HP – Palampur</p>
<p>Eroding base of agro biodiversity and diverse landraces (mainly, niche crops and sturdy and nutritious millets of hills)</p>	<ul style="list-style-type: none"> - Gradual erosion and loss of local diverse cultivars from Himalayas - Growing threat of food insecurity in the light of climate change phenomena - Growing vulnerability of hill community due to mono cropping/ adoption of improved crops which are sourced from outside 	<p>Growing vulnerability and losing opportunity to develop</p>	<ol style="list-style-type: none"> 1. Participatory conservation and characterization of pulses & millets (native varieties) 2. Community seed banks for conservation and multiplication 3. Live trials for production enhancement, multiplication and pure seed production 	<p>BAIF –Pune scientist and breeders from its research centers and ongoing field programs</p>

	<ul style="list-style-type: none"> - Loosing opportunity on bio prospecting from niche crops and millets. 			
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MAIN PROJECT COMPONENTS:

Main focus of this project would be on introducing an inter-woven package of technologies covering main livelihood support systems and sectors.

Following set of interventions are proposed after considering the socio- economic and ecological principles under the context of climate change

There are following 3 components proposed..

- 1) **Component II : Informed participation and participatory actions for ‘planned ‘adaptation by agriculture dependent hill communities** (Suggested Strategy: Community level actions and processes)

Required response under the context of climate change : Field level assessment of climatic conditions, hazards, prioritization, sectoral effects, type of vulnerability in selected location .Preparatory studies and participatory field work for devising ‘Planned’ Adaptation Strategies in select cluster of 10 villages

Key actions would include :

- 1) Participatory processes for baseline studies and sectoral vulnerability assessment, prioritisation of needs and climate smart interventions , climate change scenarios, risk mapping, socio-economic impact assessment and listing adaptation measures
- 2) Rapport building, training, exposure ,awareness building with communities, formation of primary groups such as SHGs, Farmer’s clubs, common interest groups, activity groups, village level bodies .. Capacity building of various groups for integration of climate change considerations in daily activities,Enhancing adaptive capacity by forming and strengthening local institutional base
- 3) Linkage development with local scientific and research institutes such as agriculture uni-versities, institutes working on Himalayan ecosystem, Technology providers for scouting of suitable climate smart agriculture technologies of following types to be introduced in selected villages

- 4) Working out participatory disaster preparedness strategy framework for a region (Plan for zoning, land uses, reducing losses, best practices for disaster preparedness etc.) Understanding major climate hazards and devising disaster mitigation plan along with local communities including various measures such as establishing automated weather station for monitoring data , linkage development with local scientific institutes including agriculture and meteorology departments ,Use of ICT(Information, Communication and Technology) tools for farmer friendly climate data extension including forecasting
- 5) Building adaptive capacities of communities and groups by series of trainings and capacity building measures

Suggested strategy : This is most important software component of this project. It is proposed to form community based groups of villagers in the form of

- SHGs of women who can be involved in various participatory actions on field
- Farmer's collectives such as Floriculture sangh, Fruit growers
- Livestock owners
- Water user's associations

Since it is realized that community level awareness about climate change issues is very low., thrust will be laid on building awareness .Skill training will be the important area where efforts are planned to facilitate adoption of technologies in sectors such as agriculture, water , livestock, energy and land management .

Gender integration: In hills, women have been identified as more vulnerable to effects of climate change, owing to their active and major involvement in agriculture and allied sectors. Uttarakhand is considered as money order economy as productive men mostly migrate to other locations for better income opportunities . It is women who are mostly staying back in hill villages along with other elders in family who bear the major burden of performing agricultural operations and gathering supplies for household needs such as fodder and firewood, preparing manure, collecting drinking water, etc.

Thus women have been identified as primary stakeholders of this project. Further, most of the activities are designed after considering hardship of women and steps are planned to improve the natural resource base and thereby improve direct and indirect gains for hill women. Most of the proposed activities are planned to be introduced along with women's groups such as SHGs, farmer's collectives, Commodity interest groups etc. at villager level.

Disaster preparedness: This cover participatory planning process and use of participatory tools to face future climate threats .Main activities will include climate projections, analyzing future threats, likely effects on physical and natural and human resources , mapping of threats, planning response strategies ,early warning systems, use of traditional knowledge

related to climate change monitoring ,creating village level seed banks, fodder banks and Creation of knowledge platforms

Use of innovative ICT tools to build climate resilience: Apart from above sectoral interventions, need is felt to keep communities well informed in advance about likely changes in climatic conditions. Such early warning of climate variations will also help reducing the damage and adoption of timely actions by farmers. There are many technology innovations and also service providers and in the field of climate services now. It is proposed to develop linkages with like minded service provider to allow farmers from our project villages' gain positively from such interactions and early warning systems.

Apart from this, there is need **to form an interactive platform at village or cluster level where scientist and farming community can interact with each other**. This is required as climate change is quite complex and scientific phenomena which required demystification to improve understanding and skills of local communities. Under this project it is intended to create such platform to allow exchange of information on site specific aspects of climate change, on people's perceptions of Climate threats, Constraints in adaptations and to facilitate informed participation of community groups. Such farmer scientist interactions will also help better integration of the use of climate forecasts into cropping decisions.

Details of weather based crop advisory services for the benefit of hill farmers:

Present system: In the project area, the major climatic parameters, relevant to farming are rainfall, temperature, humidity, frost and hailstorm. Presently, there is no mechanism in the project area for dissemination of forecasts and crop-weather advisories based on these events. The present system of forecasts is by India Meteorological Department (IMD) based on the data at district level, which is a general forecast on weather parameter mainly rainfall. The dissemination is through print and electronic media. It does not provide crop advisories and is not based on local weather and hence the present system is superior to the existing one for climate preparedness.

Operations: It is proposed to set up facilities for real time data capturing covering major climatic parameters with the help of private climate data service providing agencies like “SKYMET”.

Information Dissemination: Advisories will be developed in collaboration with local Krishi- Vigyan Kendra (KVK) located at Mukteshwar and Dehradun, Meteorology Departments, IMD centers and Central institutes of Veterinary Services. The advisories so developed will be disseminated through SMS in collaboration with mobile service providers. Information on weather parameters, likely impact on crops in the area, possible adaptation option etc., will be disseminated.

Costs: The users will be incurring a cost of US \$ 3.5 per year and the cost for the first year for 800 households have been included in the project. On experiencing the benefit of the information, farmers are expected to bear the cost from second year onwards. The cost of the service provider is estimated at US \$ 835 per year and the same for the project period is included in the project.

Component II : Introducing suitable combination of interwoven climate smart interventions by blending Science and Technology inputs and by focusing important livelihood support systems at household and landscape level in a cluster of 10 villages

Required response under changing climate context: Actions for farm diversification to reduce vulnerability and spreading of risks ,Environmentally sustainable livelihood promotion for food security and risk mitigation ,Reducing risks from existing agriculture practices ,Better adaptation with changing climatic conditions without compromising on production and productivity levels , To exploit full potential of livestock resource in hill conditions and there by create additional income options even under changing climatic conditions, Creating long term water reserves in region as a strategy of ‘‘planned adaptation ‘‘ and thereby making agriculture decisions climate proof, To provide opportunities for income diversification from ‘‘other than ‘‘climate dependent primary sector especially for hill women during lean periods

Introduction of climate smart agriculture / land based livelihood practices:

- 1) Conservation and revival of diverse, native and sturdy agro-biodiversity resources
Plan for strategic research on existing land races of food crops (Listing, screening, germplasm collection and characterization, unique traits and related indigenous knowledge and conservation)
- 2) Promote niche horticulture crops adaptive to changing temperature and rainfall conditions
- 3) Promote protective cultivation of horticulture crops
- 4) Promote tree fodder and dual purpose fodder species on private and community owned lands
- 5) Integration of climate smart options for disease and pest control measures , better management of farm waste, required land and soil works etc and thereby reduce losses in agriculture ,

A)Suggested Strategy for Climate Smart Agriculture

Agriculture still constitutes to be the main source of livelihood, employment and food security for hill farming communities. This is one sector which is adversely affected by climate change and variability since past one decade. The specific adverse impacts have been covered in earlier text which shows that vulnerability of mountain farming communities have increased manifolds .This necessitates adoption of required steps and technology options to sustain the income from this source even under changing context.

The shift is thus proposed to be facilitated under this project to adopt recommended climate resilient food crops, water stress tolerant crops, adoption of Low External Input Sustainable Agriculture techniques of farming such as use of vermin composting, biofertilisers, biomass management techniques etc. (for reducing GHGs)

1) Agro biodiversity Conservation and revival :

Realizing the importance of maintaining the availability and access of wild cultivars from the food security, livelihood and risk mitigation point of small farmers, conservation, management and revival of these crop types is thought as a necessary intervention

Specific activities to include:

1. Generation of cluster specific database on existing local cultivars in prescribed format.
2. Crop type wise mapping the availability in each of the identified cluster
3. Participatory selection and distribution of few ‘worthy’ cultivars. .
4. Identification of crops, species and practices for further long term systematic research
5. Identification and involvement of local institution and farmers for long term conservation and management efforts in each cluster
6. Development of crop specific agro techniques for optimizing the yields, productivity and resistance level
7. Maintaining seed bank at village level

As weather systems are becoming more and more unpredictable, there is arising an urgent need of seeds that are more robust and are able to survive the uncertainty in the weather pattern. The seeds that have evolved over thousands of years of farming are most likely to survive weather anomalies. It would be critical at this point to create seed banks of local indigenous varieties of seeds to save them from extinction. As recommended by communities during interaction it is proposed to focus on diverse traditional food crops mainly Mandua (finger millets), ramdana/chua (amaranthus), rajma (common kidney beans), ogal (buckwheat), urad (green gram), moong (black gram), naurangi (mix of pulses), gahath (horsegram), bhat (soybean), lobiya (French beans), kheera (cucumber), and other niche crops .

Technical hand holding and field support to enable transfer technologies for climate smart crops and newer pest and disease management is also to be included as project activity

2) Promotion of niche horticulture crops: As reported by communities the area is no more suitable for apple cultivation as it does not meet the required chilling conditions. Hill conditions and diversity of bio- geographic zones, altitudinal variations provides favorable conditions for growth of many horticulture crops including temperate and sub tropical fruits like pear, plum, peach ,walnut, kiwi ,Malta ,strawberry etc. The changed climate is reported to be conducive for growth of fruits requiring low chilling conditions such as, walnut, peach and grafted pear. It is proposed to introduce the high quality grafts on farmer’s field with required support for

management and aftercare. Techniques like In situ grafting will also be introduced to improve the genetic makeup of existing fruit trees.

To address an issue of dearth of quality germ plasm of recommended fruit varieties in hills , it is proposed to establish field level nurseries for innovative propagation and multiplication of seedlings and for preparation of grafts of useful horticulture species

3) Farming under protected conditions to build resilience : Due to growing uncertainties of climatic forces and extreme weather events, it becomes imperative to practice agriculture under protected conditions ex:-Low cost bamboo based poly houses and shade net technologies. Seasonal vegetable under Poly house conditions is suggested as one option for adoption of low volume and high value cropping . Promoting an off season production of vegetable as an option will be adopted .Crops such as tomato, capsicum, brinjal and cauliflower will also be tried to take the benefit of conducive climate in hills as compared to plains during summer. These horticulture interventions will help optimum use of available land (as per capita land availability is very less in hills) , making the agriculture viable under changing context and also achieving objective of income and risk diversification. Support is planned for initial investment in construction of low cost bamboo based poly houses , technical guidance and capacity building for technology adoption by participating farmers.

4) Creating fodder reserves : Perennial supply of green and nutritious fodder is of paramount importance for hill communities as livestock occupied important share of their family income .

Fodder quality and quantity both stands affected due to climate change and climate variability as it directly depends on satisfactory rainfall and intact habitat. As seen earlier, this adds to overall hardship of hill women, who is mainly responsible to collect fodder by climbing up and down the hills. Fodder security particularly during the winter months is a major problem faced by farmers. It also leads to over grazing in forests and reduced milk yield.

It is proposed to focus on native fodder trees that were once available in hill areas, Activities will include listing, nutritional analysis, collection of germ plasm, innovative propagation and integration on private lands, facilitating fodder tree regeneration ,plantation on community pastoral lands / wastelands and vanpanchayat lands which are adjacent to villages .

Efforts will be taken to design and introduce an appropriate farming system combining suitable varieties and practices of food crops, horticulture species, fodder crops after taking into consideration the spatial features and site specific climate threats.

5) Integration of climate smart options and in situ adaptation measures for disease and pest control measures , better management of farm waste, required land and soil works etc and thereby reduce losses in agriculture This will include introduction of newer practices,

promotion of low input sustainable agriculture under hill conditions ,farmer to farmer extension etc.

B) Suggested strategy for Livestock centric climate smart interventions:

As agriculture is inadequate to cope with the requirement of livelihood of all the Rural inhabitants of the State , the animal husbandry plays a significant role in the uplifting of rural economy. 85 % of cattle in the state is non-descript thus there is scope to boost up livestock production in the state through improved genetic, potential, animal health services and nutrition, strengthening livestock sector management and to increase production. BIRD UP, already has this expertise in this area and also has existing network of Cattle Breeding Centers in various parts of Uttarakhand.

Tasks :

- 1) Assessing performance of local breeds of livestock in the context of climate change
- 2) Improved management and disease and pest control measures to reduce losses in agriculture ,
- 3) Capacity building for improved health care and feeding , deworming practices

Promotion of climate smart housing for livestock to adapt with the extreme climatic events

C) Suggested strategy Water Smart interventions in hills:

Water which is a crucial resource is severally getting affected due to Climate change and variability. The unseasonal rainfall, changing intensity of rains and reducing snow fall in winter in hills all are contributing to increasing water stress. To better equip the communities to cope with this situation, it is necessary to create water reserves in villages using innovative methods and use this water efficiently.

Following interventions will be introduced at family and landscape level :

- 1) Rainwater harvesting and storage techniques
- 2) Spring rejuvenation mechanisms and treatment of recharge zones
- 3) Achieving water use efficiency by adopting climate smart agriculture techniques, checking the loss of water through evapo transpiration, switching to less water consumptive crops, etc.
- 4) Saving aquifers by keeping the recharge zones covered.. Planning and introduction of suitable measures for soil and water conservation insitu.

D) Suggested strategy :Off Farm Livelihood Promotion for hill women:

Income diversification to reduce negative impact of climate change by creating options for alternative livelihoods by focusing niche produce in Hills. With climate change posing several threats, there is growing realization that agriculture alone will no longer be sufficient to fulfill livelihood needs of most mountain communities. This means alternate opportunities

will have to be developed. Mountains have added comparative advantage in areas . Thus bio prospecting of hill crops is proposed to be introduced at the level of few families Ex: Focusing hill produce such as malta, peach ,millets and burans' and mill millets. These type of diversification efforts are expected to help in getting supplementary incomes, improved nutrition, building resilience to shocks and minimizing financial risks of women headed families

The interventions proposed is exploring scope for bio prospecting , value addition , marketing innovations of hill crops, niche hill produce which has remained to be fully explored

Component III: Knowledge generation, management and knowledge dissemination

The ultimate objective is to evolve a robust program approach, which can generate learnings, policy inputs and replication opportunities. Thus knowledge, data and strategies developed during the course of implementation on climate change adaptation under Hill Context will be appropriately documented and disseminated.

One of the outcomes planned is to create field based evidence of climate resilient program strategy in mountain ecosystems and its wider dissemination and possible replication in other parts of mountains.

Suggested strategy:

- 1) Wider dissemination of knowledge acquired for possible replication in other parts of Himalayan region for the benefit of hill communities
- 2) Creation of field based evidence of climate resilient program approach in hills
- 3) Process documentation covering field level data , experiences , approaches , technologies tested and best practices emerged
- 4) Providing knowledge and policy inputs to devise climate smart development response in Noth Western Himalayan region
- 5) Organising a multi stakeholder workshop to facilitate cross learning and sharing of climate smart approaches, required strategies and best practices having hill specificity

To achieve this following knowledge products and process documents will be generated

- Baseline report on site specific climate risks and hazard mapping
- Document on community's plan of action to foster resilience -
- Disaster preparedness plan of project villages
- Process documentation on building local level adaptive capacities (steps)

- Technology fact sheets covering climate smart sectoral interventions.
- Report covering local agro biodiversity of project villages
- Impact assessment report
- Select best practices
- Community involvement tools for participatory climate adaptation
- Articles in peer-reviewed journals, workshop / conference presentations, guidance notes and policy briefs
- Synthesis products on methodologies geared for practitioners or on learning about multi-sectoral, multi-stakeholder processes and providing evidence to policy and program design

Duration of the Project:

The activities under this project are proposed **for four years**.

(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 of the Adaptation Fund.

Criteria	Key Benefits
Social	<ul style="list-style-type: none"> ➔ The program will facilitate building cohesive groups of villagers to respond positively to forces of climate change . ➔ The entire set of activities are planned looking at growing vulnerabilities of hill families, it thus will lead to better adaptation by hill communities in their own setting without having to migrate to other cities ➔ The perceptions as expressed by hill communities during preliminary consultation have formed base for project activities thus care is taken to respect and care local knowledge ➔ The program will lead to revival of some of the useful traditions of hill communities with regards to hill crops, water tapping systems etc. which are getting eroded fast ➔ Hill Women will be at the center of most of the field actions . The project activities are planned to enable reduction of hardship of hill women in the long run ➔ The project processes will lead to empowerment of communities through training and awareness building ➔ Project will take care of local food Security and nutrition as it will focus on local agro biodiversity conservation and revival ➔ Project will help improving the adaptive capacities of local communities and

	<p>thereby creation of hope for them even under emerging threat of climate change</p>
Economic	<ul style="list-style-type: none"> ➔ The central focus of project activities is to ensure sustained income for hill farmers in their own settings under changing climate change context by focusing on regenerative capacities of resources . ➔ Adoption of useful technologies will contribute to enhanced yield and income from agriculture, horticulture and livestock and off farm sectors ➔ The project will create alternate options for livelihood generation for hill families by adoption of income diversification options in their own setting as mentioned in project . ➔ The steps for disaster preparedness and climate change related planning and coping will reduce the likely damages to resources and this intern will minimize economic loss due to sudden hazards ➔ The project activities suggests better integration of climate change perspectives in to sector specific development actions . thus sectors like agriculture, livestock, forest and fodder will continue to provide economic gains to communities ➔ Skill enhancement of communities will further open up better income earning options for local youths
Environmental	<ul style="list-style-type: none"> ➔ The entire project activities are planned by considering the mountain specificities and thus will be implemented in harmony with its ecosystems ➔ The actions such as eco restoration of vanpanchayat lands will led to protection of existing ecosystems ➔ The project envisages improved management of natural resources such as land, soil, forests, water sources etc . This will build better future for new generation of hill farmers and will help sustainable development ➔ Most of the activities proposed are based on principle of Environmentally sound development and principles of Restore, Reuse and Recycle . ➔ The project will result into evolution of robust model to adapt with climate change in hills of IHR , thereby ensuring co- existence of communities and healthy mountain ecosystems ➔ The activities are planned in a manner that it will result into creation of long term reserves of important resources such as water, fodder, biomass, food and NTFPs in project villages ,this will act as insurance against future threats

(C) Describe or provide an analysis of the cost-effectiveness of the proposed project / programme.

The field action components form the main part of proposed project (60%). This mainly includes actions for introducing a holistic programme, interweaving mix of technologies at household level focusing important livelihood resources i.e Agri-horti-forestry and fodder , water resource, land and soil resource, livestock resource, energy and off-farm livelihood resources.

It is proposed to pilot test the model (combining complementary sectoral interventions at near about 800 families of 10 villages). The support is required as these are proposed as modifications to existing age old practices adopted by these households. Further the initial investment is high but is likely to be cost effective in long run. It is not desirable that hill communities ,who are already living at subsistence level can pay for these new initiatives.

This component proposes developing alternative agriculture system to better adapt to changes in climatic conditions. This will ensure better productivity and sustained yield, minimum losses and damage and risk of crop failure. Through the support the cost towards agriculture diversification is also covered, which is expected to be required strategy for adaptation under changing climate context.

The key activities envisaged under this component are conducting trainings, establishing demonstrations and introducing a range of climate smart agricultural practices for mountain specific agri –horti –forestry and fodder crops, which are high value, nutritious and sturdy .

The support is requested for components such as introduction of water stress tolerant crops (improved seed), fruit trees saplings, cost of manuring & watering, improved vegetable cultivation, protected cultivation with irrigation facility, conservation of agro-bio diversity & Community seed bank, promotion of organic farming, establishment of nursery, bee Keeping and actions like in-situ grafting of high value temperate fruit crops. Support also includes costs for interventions like slope stabilization which are also worth demonstrating on degraded lands. Once convinced, the communities will replicate these practices in other areas on their own.

Water being a critical resource in agriculture, fund support is mainly for ensuring optimum conservation and storage of rainwater in hills. The support is proposed only towards pilot testing and demonstrating site specific interventions and technologies, which farmers can adopt on their own later on. Under this, pilot testing useful technologies suitable to mountainous regions like roof top rain water harvesting (individual & community based), and natural spring rejuvenation, innovative water use efficiency demos (drip/sprinkler). The major cost is for spring rejuvenation which are fast drying due to alteration in catchment's cover.

Regarding livestock resources, the fund support is mainly to demonstrate scientific livestock management practices, promote fodder plantation (grass/trees), screening & documentation of native fodder trees which can ensure sustained productivity through regeneration of local resource. As a part of diversification efforts, promotion of poultry and cold water fisheries through appropriate demonstrations are proposed as these activities would help the hill communities in building resilience in the system.

It is also proposed to support capacity building efforts for early warning systems, disaster preparedness and understanding exact vulnerability of mountain communities. These activities will be implemented in a synergistic manner and necessary linkages are thus proposed to be developed with reputed scientific and research institutes ,already working in hills. The project support training of SHGs/PO, training of local cadre of technicians, training of user groups and village level committees.

The losses for the community without the implementation of the programme are as follows.

1. Degradation of land and water resources and resultant loss of productivity owing to degraded natural resources
2. Low level of productivity from the existing cultivation practices
3. Loss of land, livestock & dwelling units due to occurrence of natural calamity
4. Drudgery for women and children
5. Out migration of vulnerable community

The major advantage of the proposed project as against alternative options is in its ability to provide sustainable livelihood through a mix of viable activities to vulnerable hill communities living in the project area. As such the proposed project is environmentally sound and socially acceptable and enables the community to address core issue of climate change/variability.

To sum up the following key characteristics of the project would considerably enhance its cost effectiveness:

1. Most of the interventions are aimed at livelihood generation based on regenerative and interwoven practices.
2. The activities proposed apart from regeneration of living environment, enables in diversification of livelihood option of the hill community, thereby facilitate in better coping ability to the perceived change in climate. .
3. The resultant effect in terms of sustainable income, employment and food security while ensuring resource enhancement, will be much higher as compared to cost incurred.
4. The interventions proposed are highly cost effective compared to cost that will have to be incurred for relief and rehabilitation.

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

India is a large developing country with diverse climatic zones. The livelihood of vast population depends on climate-sensitive economic sectors like agriculture, forestry and fisheries. The climate change vulnerability and impact studies in India assume high degree of uncertainty in the assessment due to 'limited understanding of many critical processes in the climate system, existence of multiple climatic and non-climatic stresses, regional-scale variations and non linearity. The costs of not addressing climate change or to adapt to it are very uncertain, but their consequences are enormous. Early actions on adaptation therefore are prudent and consistent from the viewpoint of 'precautionary principle.

In India about 700 million living in rural areas directly depend on climate-sensitive sectors like agriculture, forests and fisheries and natural resources such as water, biodiversity, mangroves, coastal zones, and grasslands. Furthermore, the adaptive capacity of dry land farmers, forest dwellers, fisher folk and nomadic shepherds is very low. Climate change is likely to impact all natural ecosystems as well as socio-economic systems in India. In addition, poverty is a critical factor that limits the adaptive capacity of rural people in India (Government of India 2008). The details of project elements related to the National and Sub-national Policies are given in the below given table.

Consistency / alignment of existing national and sub national programs

The proposed project activities are in line with many national and sub national goals and policy framework:

- a. The actions proposed are in line with National Action Plan for Climate Change and various Missions proposed under it.
- b. The interventions proposed aimed at increased adaptation for agriculture dependent hill communities of North Western Himalayan region – It is also spelt out as important thrust area in IPCC document and State action plan of climate change in Uttarakhand
- c. The actions proposed are part and parcel of India's commitment under Kyoto Protocol . The proposed activities are also in line with objectives mentioned under India's Biological Diversity Act 2002 which aims at conservation of biodiversity.
- d. The proposed project actions will fulfill the objectives of number of sub national acts and policies such as Disaster Management Act, Environment policy and Vanpanchayat Act of state of Uttarakhand

- e. Most of the outcomes defined will also help fulfilling India's commitment to UN's MDGs
- f. It is also in line with major poverty reduction measures of government of India

Table 8: *The project / programme is consistent with national or sub-national sustainable development strategies*

Key national policy /program	Programme elements /components related to the Policy
National and State Action Plans for Climate Change	Climate smart agri practices and innovations including introduction of water stress tolerant crops, crop diversification, organic farming, soil and water conservation are aligned to National Mission on Sustainable Agriculture. Water harvesting, water saving devices and spring regeneration are related to National Water Mission, which has set a goal of 20 percent improvement in water use efficiency. Conservation of agro-biodiversity, forest cover and other ecological values in the Himalayan region forms part of National Mission for Sustaining the Himalayan Ecosystem. Similarly, energy based interventions are broadly covered by National Solar Mission as well as National Mission for Enhanced Energy Efficiency.
National Agriculture Policy	Soil conservation, organic agriculture, conserving agro-biodiversity and promoting tolerant species
National Disaster Management Policy	Early warning systems linked to community preparedness and risk assessment
National Forest Policy	Increasing tree cover in non-forest areas, forest regeneration
National Environmental Policy	Eco-restoration and forest regeneration, conservation of native species and agro-biodiversity, water resources conservation and management, soil conservation
National Livestock Policy	Promotion of livestock management practices, fodder plantation, screening and documentation of fodder trees.

(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.

The programme components will be strictly implemented in accordance with various standards set out by various Ministries of Government of India and various Departments at the State level such as Department of Agriculture, Horticulture, Environment & Forest, Animal Husbandry, Fisheries, Renewable energy etc. For inputs and materials such as seeds, planting materials standards established by national research and technical institutes as well as by national level

organizations like Indian Council of Agriculture Research (ICAR) will be adhered to. The details of the applicable standards vis-a-vis broad activities are indicated in the table below:

Activity	Applicable standards	Application to Project	Monitoring
1. Disaster preparedness, contingency planning and best practices adoption.	Technical standards of the instruments to be installed in Weather Stations.	Establishment of Weather Station, provision of SMS based advisories	Functioning of Weather Station and number and quality of SMS advisories.
2. Climate Smart agri practices & Innovations	Standards prescribed by Dept of Agriculture and Dept. of Horticulture; Package of Practices by the local Agriculture University.	Water stress tolerant crops, promotion of fruit trees, vegetables, organic farming, nursery, protective cultivation, seed bank.	Field visit, photos, farmer level registers indicating various interventions.
3. Strategic water reserve creation	Standards prescribed by Water Resource Department	Roof top rain water harvesting (Individual & community), natural spring rejuvenation, drip/sprinkler demonstration	Field visit, photos, progress report
4. Livestock and fodder development	Standards prescribed by Dept. of Animal husbandry and Fisheries	Livestock management, fodder plantation, screening & documentation of fodder trees, poultry, cold water fisheries	Field visit, Photos, progress report, document on screening of fodder.
5. Clean energy promotion	Standards prescribed by MNRE and State Department of Renewable Energy	Demonstration of solar water heater, bio-gas, pine needle briquetting	field visit, Photos, progress report

(F) Describe if there is duplication of project / programme with other funding sources, if any.

Project	Objectives	Complementarities	Geographical coverage	Agency
Technology Interventions in Mountain Eco system (TIME)	To introduce suitable technologies having hill specificities	Technology interventions suited to mountain ecosystem are proposed. The project is yet to commence implementation	In three states of North Western Himalayas	Department of Science and Technology (DST), Govt of India
Programme on Farmer's Awareness, capacity building actions and ICT enabled information sharing mechanism	To increase the interaction between the farmers and the Agro-meteorological Service providers like India Meteorological Department (MD), State Agriculture University (SAU), Indian Council of Agriculture Research (ICAR)	Greater awareness of the farmers about the importance of climate and its impact on the agricultural crops and its management	All India	Ministry of Earth Science, ICAR & IMD

This project will not duplicate with any of the on-going projects or programmes. However, it complements on-going and future activities which are all geared towards achieving the long-term goal of climate change in State. Moreover, complementarities out of the above programmes will be harnessed for improving the efficiency of the proposed project.

(G) If applicable, describe the learning and knowledge management component to capture and disseminate lessons learned.

One of the outcomes of this project is to create field based evidence of climate resilient program strategy in mountain ecosystems and it's wider dissemination and possible replication in other parts of mountains. These efforts are expected to result in to captured and disseminated the learning ,insights and processes and impacts of climate change approaches under Hill context

To achieve this following knowledge products and process documents will be generated

1. Baseline report on site specific climate risks and hazard mapping
2. Document on community's plan of action to foster resilience -
3. Disaster preparedness plan of project villages
4. Process documentation on building local level adaptive capacities (steps)
5. Technology fact sheets covering climate smart sectoral interventions.
6. Report covering local agro biodiversity of project villages
7. Impact assessment report
8. Select best practices
9. Community involvement tools for participatory climate adaptation

(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 of the Adaptation Fund.

Number of consultations have been undertaken both at village level involving villagers from eight villages and also at district level involving district officials, scientists and professionals from development agencies . The summary is indicated in table below:

Consultation	Participation	Objective	Outcome
<p>Multi stakeholder meetings –</p> <p>On 11-12 Th Nov- 2011 at Forest Research Institute – Dehradun ,Uttarakhand</p> <p>BAIF along with Department of Biotechnology ,DST and Himmothan society network could organise a two days brain storming workshop ,’’ Crafting Potential Strategies and measures for North Western Himalayn region.</p>	<p>The workshop participants included around 40-45 invitees including eminent scientists, development workers, professionals, thematic specialists, Academicians, technocrats and representatives of Department of Sciences and Technology and Department of Biotechnology, GoI and like minded agencies like partners of Himmothan Society etc.having similar mandate</p>	<p>To evolve a suitable strategy framework based on sound principles of ecology and economics for sustainable livelihood development and for management of natural resource in Central and Western Himalayan hill regions</p> <p>Climate change threat was also discussed in detailed</p>	<p>At the end of two days discussion, a clarity was jointly evolved on suitable program approaches in the context of hills , along with Required technological framework to plan development interventions in hill areas. This has also facilitated ensuring future synergetic efforts by main participating organizations to achieve development goal with hill specificity</p>
<p>Multi stakeholder meetings –</p> <p>Held on 16-18 July 2013, At Scientist Hostel, FRI- Dehradun</p> <p>BAIF was part of Core group, formed by DST – Department of science and technology –GoI, which met to discuss scope and design of TIME-LEARN program which is launched by DST as a multi institutional, multi location network program in three Himalayan states in Central and Western</p>	<p>This was attended by eminent scientists, development workers, professionals, thematic specialists, Academicians, technocrats and representatives of government and like minded agencies from three main states of North Western Himalaya</p>	<p>To Identify critical areas requiring interventions in hills (Including climate change) and to evolve a suitable program to help addressing fundamental livelihood issues of the mountain communities by generation of new economic activities in the fragile hills.</p>	<p>The workshop resulted in to launching a TIME program by DST as an interface between number of premier NGOs , research and scientific organizations working in hills and Himalaya’s communities.</p>

Himalayas.			
<p>Field assessment of climate change effects and related vulnerability in Uttarakhand</p> <p>held on August 2012. (Using CRiSTAL (Community-based Risk Screening Tool – Adaptation and Livelihoods), a decision support tool as developed by IUCN-IISD ,SEI) .</p> <p>An assessment was conducted on in villages of Champavat by BAIF ‘s interdisciplinary team members</p>		<p>To understand</p> <ol style="list-style-type: none"> 1. How climate-related hazards affect project area and local livelihoods <ol style="list-style-type: none"> a. How people cope with the impacts of these hazards b. Which livelihood resources are most affected by climate hazards and which ones are most important for coping c. How project activities affect access to or availability of these critical livelihood resources d. What adjustments can be made to a project to increase access to or availability of these critical livelihood resources 	<p>An assessment helped to understand and discuss adaptation and mitigation strategies as suggested by communities for climate change phenomenon in a region</p>

Details of vulnerability assessment exercise with villagers:

A day long exercise was conducted followed by field visit to assess the site specific climate change and variability , people’s perceptions and suggested coping mechanisms.

The following participatory tools were used to facilitate participatory discussion and brain storming

1. Historical time line
2. Hazard mapping
3. Hazard prioritization
4. Seasonal calendar
5. Crop calendar
6. Vulnerability matrix
7. Impact matrix



8. Adaptation matrix

26-30 villagers from 8 different villages including men and women participated in this discussion.

Following Villages from Champavat were covered.

1. Pardhyani
2. Kapdi
3. Manar
4. Gambhir
5. Baaj
6. Sujan
7. Dikti
8. Tapanipal



Results and findings:-

Community response with regards to temperature changes:
Villagers told increase in maximum temperature recently.

Average temperature			
Earlier (few years back)		Now	
Maximum	Minimum	Maximum	Minimum
30°C	Below 0°C	Above 40°C	+3°C or +4°C



Main hazards identified (in terms of impact on livelihoods as indicated by community):

1. Less/reduced snowfall
2. Drought (Not getting rainfall when it is actually needed thereby leading to total loss in agriculture)
3. Rainfall variability and Unseasonal rainfall

Results of the discussion are presented in table below:

Table 11; Vulnerability Assessment Results:

Hazards	Description	Current coping strategies as adopted by communities
1. Reduced snowfall	<ul style="list-style-type: none"> • Snowfall has reduced significantly in the last 3-4 years. • Earlier, thickness of the snow used to be between 1-2 feet, but now it has reduced down to only 2 inches. • This has significantly affected the 	<ul style="list-style-type: none"> • Instead of apple, fruits like Malta, Peach etc. that require low chilling hours are grown now. • Since horticulture was mainly affected, people have now started growing vegetables.

	<p>growth of temperate fruits especially apple.</p> <ul style="list-style-type: none"> • Yield obtained from wheat used to be good, but, now since the snowfall has reduced, the quality of wheat has also decreased. • Because of sufficient amount of snowfall, the insects or pests also used to die earlier, but now they are growing even more. • 1994 : Major snowfall (2 feet) 	
2. Drought	<ul style="list-style-type: none"> • Because of delayed monsoon this year, crop produce has been affected the most. • Due to scarcity of water, people had to bring drinking water from a distance of 300-400m. • Many domestic animals also died this year due to scarcity of water. • 1977-1978 : Major drought 	<ul style="list-style-type: none"> • Changes in cropping pattern • Also people have now started digging wells. • Dry fodder was purchased this year because of lack of green fodder.
3. Unseasonal rainfall	<ul style="list-style-type: none"> • Till last year, onset of rainfall was latest by 28th June, but this year it did not rain at all between March-July. • Earlier in July-Aug, sometimes it used to rain continuously for 7 nights (also known as Satrati/Satchadi), but now it doesn't happen. • If it rains by 28th of June, then only the rains are beneficial for the crops otherwise they are not. • Number of monsoon days has decreased i.e. onset of monsoon is delayed and it gets over early by 2nd of September. • Previously when it used to rain, the soil used to remain moist; but now the soil has become hard. 	<ul style="list-style-type: none"> • Changed cropping pattern. Nowadays, Kharif crops are cultivated on a large scale as compared to Rabi crops. • Some of the villagers have recently started fishing in the nearby water bodies. The species present in these water bodies are mainly Common carps, Trout, Silver carps, Rohu etc.

Broad understanding generated from community interactions:

- Main adverse change of climate change rated by people is reduced incidence of snow fall during winter due to warmer winters. The good snowfall during winter used to provide required temperature conditions for satisfactory growth of temperate fruit and vegetable crops , this used to help maintaining the required temperature and soil moisture and also used to help reducing pests .

- Other adverse effects mentioned were increase in maximum temperatures, decrease in minimum temperatures both during winter and summer.
- Unseasonal, irregular, unequal and less consistent and unpredictable rains as compared with earlier periods. (In olden days people used to term rain fall as ‘‘Satzhadi’’ meaning –‘‘Rain which does not stop continuously for seven days’’ .People mentioned that this is not seen now.
- Late monsoon leading to drought like situation and resulting in failure of main crops sown in March.
- People also mentioned changes such as, Increase in mosquitoes, Early flowering in rhododendron trees. New pests on capsicum, Need for fans which were not seen in hills before.

Sectoral implications of climate change and variability and growing vulnerability of livelihood support system:

Agriculture & horticulture sectors have been affected the most. This has also resulted in changing cropping pattern in this region. Cultivation of hill food crops such as local millets, buckwheat, soybean and barley are on decline. Crops that need freezing temperatures, such as apples, are on the decline. The lack of chilling temperatures is leading to a decrease in fruit setting. Crops that were not originally grown in this belt are now increasingly cultivated Ex :- Tomatoes, capsicum, flowers etc. This has resulted in people depending upon plain markets for the supply of basic food produce.

Water is other important resource whose availability is influenced adversely in hills. Water in hills was never anticipated as a problem earlier but this year people had to purchase water. Many people are digging up wells which is a new development. Many people had to struggle hard to fill up water from natural springs in hilly terrains. People do not seem to be aware about different proven techniques of harvesting, storage and use of water in hills.

Livestock: Livestock resource is affected due to shortage of nutritive fodder even in monsoon. Due to this shortage, castles have been released in to forests this year.

While interacting with communities to understand their take on climate change Adaptation measures, it was noticed that people are clue less, disoriented and ill-equipped to deal with climate change phenomena. The mountain communities are thus most vulnerable to climate change effects.

In terms of overall impact on communities, from this field level exercise, it is thus realized that climate change has fastened the process of degradation of natural resource base, damage to biodiversity, and growing marginalization of the hill communities.

Community recommended the following interventions:

- 1. *Water resource centric development work:*** mainly to tap rainwater and ground water in hills – Eg:- Spring revival, diversion based irrigation, roof top rainwater harvesting,
- 2. *Revival of useful agriculture traditions:*** People narrated usefulness of two traditional methods i.e **Baranaj** (Plantation of 12 different varieties/ type of food crops to be able to get assured yield of at least 5 crops in case of climate uncertainty) ,**Aicha-Paicha**, participatory exchange of local seeds to be able to reduce dependency of farmers on seed companies.
- 3. *Technical hand holding for newly introduced crops:*** People are not much aware how to adopt to newer cropping patterns resulting from upward shift of agro climatic belt due to increased temperature. They expressed need for technical hand holding for crops which are new to the region

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

Most of the interventions proposed are for piloting of newer technologies in the context of climate change. The project envisages incubation of these worthy technologies at the level of 800 households with lot of technical hand holding in the field. Once piloted successfully, the efforts can be made to attract mainstream funding for further replication and up scaling of this climate smart model in other parts of North Western Himalayas.

Overall Justification

Most of the interventions are aimed at climate resilient livelihood generation based on regenerative and interwoven practices. The resultant effect would be sustainable income, employment and food security even during extreme weather events due to the farm/family centric multi-activity approach. The per family investment works out to USD 745 (approx.), which is significantly lower than the cost of rehabilitation due to climate related disasters. The recent climate related disaster struck in the state has given a warning signal, for development of such a sustainable system which can enable the community to adapt and prevent large scale losses. This sort of home-stead based approach as a high potential for replication, once it is proven, as most of the activities are financially viable in the long run.

The component-wise full cost of adaptation reasoning is discussed below:

Component 1: Baseline Studies

Baseline without Adaptation fund: People residing in the project villages are clue less about adaptation measures and the communities are feeling vulnerable due to growing uncertainty of weather events.

With Adaptation Fund Support: Fund support would enable site specific studies on participatory assessment of climate risks, vulnerabilities and future climate change scenarios, risk mapping, socio-economic impact assessment and listing adaptation measures. This would enable positive effects on physical and natural and human resources, mapping of threats, planning response strategies etc. Baseline will be created in respect of all the participating 800 households in the project villages.

Component 2: Training and capacity building measures

Baseline without Adaptation fund: In the absence of appropriate training and capacity building, the community is unable to adopt feasible climate change adaptation measures. Further, there are hardly any agencies in the field for undertaking required hand holding of the communities covering multiple livelihood sectors having a bearing on climate change adaptation.

With Adaptation Fund Support: With appropriate training and capacity building, the ability of the community to adopt feasible interventions will greatly be improved. It is proposed to impart 50 Nos of training to Self Help Groups/Producer Organizations, 10 Nos of training of local cadre of technicians who are residing in the project villages, 30 Nos of training on climate resilient activities and 20 Nos exposure visits.

Component 3: Formation and strengthening of local institutional base

Baseline without Adaptation fund: Normally projects / programme are taken-up without much stakeholder consultations especially during the planning stage. Stakeholders especially the vulnerable communities who are the direct beneficiaries of any project are not taken on board while designing various components as also at other stages of implementation. Hence mobilization of the stakeholders, constitution of village level institutions formation of SHGs, farmers clubs, water users association, etc. are not given required focus.

With Adaptation Fund Support: In the project scenario a systematic efforts will be made in mobilizing the stakeholders so that a gender balanced village level institution such as SHGs, farmers clubs, water users association, etc will be established for performing various roles during project implementation and sustaining the programme activities thereafter. It is proposed to form/strengthen 50 Nos of such village level institutions under the project.

Component 4: Disaster preparedness, contingency, planning and best practice adoption

Baseline without Adaptation fund: In the project villages, farm families are highly exposed to climate change related livelihood insecurity with no definite clue to the reasons or the solutions. Vulnerability assessment was never done by any Governmental agencies in the area while designing projects. Weather information presently provided is hardly sufficient and effective to make any effective plan in the event of natural calamity and in most of the cases its reach to remote areas is doubtful.

With Adaptation Fund Support: The project has been designed to start with vulnerability assessment in participatory way so that all the target households have reasonable understanding of climate change related impact on their life & livelihood and solutions. Availability of reliable weather based information would enable the community to prepare themselves against disaster as well as plan contingencies. Towards this end, project proposes to establish one weather station at the project level and provide SMS based weather advisories to all the 800 households.

Component 5: Climate Smart agri practices and innovations

Baseline without Adaptation fund: The agriculture in this part is mostly rain fed and characterized by low productivity and hence highly vulnerable to climate change. Potential of horticulture including organic farming and protected cultivation as a livelihood options against adverse impact of climate change remains largely untapped. Increased vulnerability of agri – horti sectors and absence of any other livelihood options leading to migration of productive labour. Growing threats to agro-biodiversity and food security.

With Adaptation Fund Support: Adoption of a set of package of interventions / processes and practices which are climate smart, context specific and feasible in mountain ecosystems, is expected to contribute to enhanced yield and income from agriculture and horticulture sectors. Introduction of niche fruit crops having high value and which require low chilling conditions with required technical support will be focussed. The changed climate is reported to be conducive for growth of fruits requiring low chilling conditions such as, walnut, peach and grafted pear. Techniques like in-situ grafting will also be introduced to improve the genetic makeup of existing fruit trees. Promotion of farming under protected conditions (low cost bamboo based poly houses) would help in growing vegetables even under adverse climatic conditions. Long term conservation of useful hill biodiversity for food security and income diversification through interventions like seed bank is also proposed. These interventions are expected to create alternate livelihood options to the hill farmers and thereby enabling them to cope with the adverse impact of climate change.

Component 6: Strategic Water reserve creation

Baseline without Adaptation fund: Growing scarcity of water (surface and sub surface) for drinking and irrigation purpose due to erratic, unseasonal, and unpredictable rains in hills since last few years. Drinking water sources are getting dried up, thus adding to drudgery of women.

With Adaptation Fund Support: Creation of water reserves in mountain regions as an adaptation strategy to water stress situations on account of climate change are envisaged by undertaking site specific measures. Rain water harvesting techniques (individual & community), natural spring rejuvenation and demonstration of water saving devices are the activities suggested.

Component 7: Livestock and fodder development

Baseline without Adaptation fund: Animal husbandry is turning unproductive and not so remunerative due to scarcity of fodder. Increased cost of production due to purchase of fodder from outside. Growing hardship of hill women. Dependence on agriculture alone will not be sufficient in ensuring resilience to climate change.

With Adaptation Fund Support: It is proposed to focus on fodder trees, which were native to hill areas. Activities include listing of native fodder, nutritional analysis, collection of germ plasm, innovative propagation and integration on private lands. Further, fodder tree regeneration/plantation on community pastoral lands / wastelands and vanpanchayat lands also are envisaged. Once adequate fodder base is built, it would be easy to implement climate resilient livestock management practices which are capable of ensuring sustainable income.

Component 8: Eco restoration and forest regeneration

Baseline without Adaptation fund: Intense rainfall coupled with deforestation, sloppy terrain and loose soil is leading to loss of fertile soil, thereby making agriculture impossible.

With Adaptation Fund Support: Eco restoration of vanpanchayat lands, plantation, gap filling of forest species, and land restoration through soil and water conservation are the proposed activities. This would enable to create long term reserve of fodder and other vegetation from Vanpanchayat lands.

With Adaptation Fund Support: It is thus proposed to introduce alternate energy resources and energy saving devices such as solar water heating system, syntex based bio gas, pine needle bricketing techniques etc under the project as demonstration units.

Component 10: Knowledge management, documentation and dissemination

Baseline without Adaptation fund: Mechanism to capture processes and factors leading to the success or failure of the project, has been sadly missing in most of the flagship projects. Thereby, it becomes quite often difficult to replicate and upscale many of the pilot projects implemented in the country. Documentation of the project during as well as after implementation is a grossly neglected area whereby limiting the scope for dissemination of information.

Adaptation Alternative: Under the project, attempt to document case studies will be made in a systematic manner. Further, impact assessment will be undertaken and fact sheets of the achievement will be made known to all stakeholders. This will give an idea, about the direction of the project and results on various interventions at a regular frequency.

(J) Describe how the sustainability of the project/programme outcomes has been taken into account when designing the project / programme.

Sustainability of the outcome/output of any given development project/programme is a major challenge. Given a very dynamic and unpredictable scenarios like climate change, sustaining the adaptive capacity strategies by the project beneficiaries over a longer period is further more challenging. Notwithstanding the above, the instant project has been designed by keeping in view sustainability aspects as indicated below:

The project has been designed keeping in view sustainability aspects as indicated below:

- ➔ Project design is based on a solid foundation of people's participation and developing strong institutions of people for ensuring the sustainability.
- ➔ The actions through this project are proposed in a compact area of 10 villages covering manageable households of around 800 families and surrounding landscape of two blocks of Champavat and Pati of Champavat district.
- ➔ Training and capacity building of primary groups including commodity interest groups, SHGs, Farmer's club forms major component of this project. These groups especially SHGs could be credit linked to nearby service area banks for sustainable functioning. Further, efforts will be made to bring women SHGs under the ambit of Govt of India programme on National Rural Livelihood Mission (NRLM).
- ➔ Creation of local cadre of technicians in select villages is another specialty of the project. These technicians would provide required services and help to the project beneficiaries even after the closure of the funding as they will be residing in the project villages. Further, they can provide services at a nominal cost for up scaling and replication in other villages also.
- ➔ The project activities proposed are based on ecologically sound principles, i.e- reduce, reuse, restore and regenerate. This approach would ensure long term sustainability of existing natural resources in the region viz. vegetation, agro biodiversity, water, land and soil resources .

- ➔ Although during the project period the Executing Entity is facilitating the implementation, the entire responsibility will be handed over to the People's institutions formed both at village level and at cluster level in a gradual manner.
- ➔ Through positive experiences generated through adoption of climate smart practices, it is hoped that the project components will be internalized gradually by most of the participants. Farmers are expected to meet the subscription cost of SMS from the second year onwards and thereby continuing it sustainably.
- ➔ Project activities also have taken care of institutional sustainability by proposing formation and strengthening of village level seed banks to be managed by group of participating farmers, village level processing units to be managed by local SHGs , Village and cluster level group of commodity focused farmers, taking responsibility for aggregation and developing market linkages.
- ➔ The central committee will work in close association with cluster and village level groups so as to enhance their capacities for post project management of the programme while also ensuring the successful running of enterprises and continued technical hand holding in the region
- ➔ State Government will be taken on board in up scaling and replication in similar agro-climatic hill regions through convergence of existing programmes/projects under various line Departments like Agriculture, Horticulture, Animal Husbandry, Fisheries etc. Funds available under programmes like Rashtriya Krishi Vikas Yojana (RKVY), National Horticulture Mission (NHM), National Mission on Micro Irrigation (NMMI) etc could be dovetailed.
- ➔ Once proved, most of the interventions under climate smart agriculture, water reserve creation, livestock etc are economically viable and could easily be included in the District Credit Plan to be financed by banks.

The project will be implemented with community groups such as SHGs and Farmer's and livestock owners' collectives at village level. For area based interventions, the activities to be taken up with the help of panchayats /village level bodies. As a strategy it is propose to build a local cadre of technicians, whom necessary technical training will be imparted. They in turn can help in wider dissemination of suitable technologies in region. Their services can be used by interested farmers even on payment basis. The role of BIRD-UK will be technology scouting, demonstration and introduction. It is expected that local communities will adopt these technologies on their own after witnessing benefits. Once the technologies are found to be useful, there is need to facilitate its replication

Throughout the project efforts will be made to involve local, district level and national government officials and departments in loop. These members will be involved in consultations, field visits, scouting of technologies and programs etc. Further, concept appreciation visits to field sites by policy makers and government officials also will be planned. The best practices and

case studies will be disseminated through local and national media to create required acceptability. Together these efforts are expected to help in attracting the mainstream funding in the longer run.

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

Check-list 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	The project complies with Environment (Protection) Act, 1986 and Forest Conservation Act, 1980.	None
Access and Equity	The project provides fair and equitable access to the project beneficiaries in terms of alternate climate resilient livelihood options including provision of clean water and renewable energy options. The project will not be impeding access to any of the other requirements like health, clean water, sanitation, energy, education, housing, safe and decent working conditions and land rights.	None
Marginalized and Vulnerable Groups	The project is basically aimed at providing alternate climate resilient livelihood options and income to marginalised community living in the project area and as such will not have any adverse impact on other marginalised and vulnerable groups	None
Human Rights	The project does not foresee any violation of human rights of the community living in the hill region	None
Gender Equity and Women's Empowerment	The project proposes to form/strengthen Self-Help Groups (SHGs) for empowering women in the project area, who in turn will be involved in taking up some of the livelihood activities. Capacity building of women also will be taken care of through appropriate training modules. Many interventions like strategic water reserve creation, livestock management, renewable energy etc. are going to have direct impact in reducing the drudgery of women. The above	None

	measures will ensure participation by women fully and equitably, receive comparable socio-economic benefits and that they do not suffer adverse effect.	
Core Labour Rights	Payments to labour under the project will be made as per Government approved norms duly following minimum wage rate and hence ensuring core labour rights.	None
Indigenous Peoples	Not applicable to this project	None
Involuntary Resettlement	The project does not displace any community and hence issue of resettlement does not arise	None
Protection of Natural Habitats	The project does not affect any of the natural habitats	None
Conservation of Biological Diversity	The project promotes biological diversity through forest regeneration, promotion of agro-biodiversity, establishment of community seed bank etc.	None
Climate Change	The project is basically for enhancing the adaptive capacity of the community living in the north west Himalayan hill region against adverse impact of climate change and is not expected to contribute to GHG emissions	None
Pollution Prevention and Resource Efficiency	Project is basically for regeneration of environment and promotion of climate smart agri practices. Promotion of organic farming is one of the major components. Use of inputs of chemical origin will be minimal and hence may not cause any pollution to the environment. Project also proposes to promote renewable energy components on demonstration basis which are environment friendly and cost effective.	None
Public Health	No adverse impact on public health related issues is envisaged. Promotion of organic farming is expected to improve the public health.	None
Physical and Cultural Heritage	No adverse impact on cultural heritage related issues is identified.	None
Lands and Soil Conservation	Soil conservation of about 50 has of area is envisaged for eco-restoration. Other components will not create any damage to land & soil resources.	None

IN VIEW OF THE ABOVE THE PROJECT IS CATEGORIZED AS “CATEGORY C” WITH NO ADVERSE ENVIRONMENTAL OR SOCIAL IMPACTS.

PART III: IMPLEMENTATION ARRANGEMENTS

A. Describe the arrangements for project / programme implementation.

The project will be anchored by BIRD- UK, having its office at Haridwar. BIRD-UK is a Non-Governmental Organisation promoted by Bharatiya Agro-Industries Foundation (BAIF) based in Pune, Maharashtra. BAIF-UP is a branch of its parent organisation BAIF in the nearby State of Uttar Pradesh. The team of BIRD UK will take direct implementation responsibility. Techno managerial and technical inputs will be drawn from experts of BAIF –UP, BAIF Delhi office and BAIF Pune office from time to time.

The BIRD- UK has good network of field level offices and regional centers across Uttarakhand. A full-fledged team is based at District Champawat to implement and oversee work through its Center for Hill Areas. At the level of community a good rapport is built with SHGs and farmer’s groups, as the agency is regularly in touch with cattle owners in providing improved breeding services.

BAIF-Uttarakhand team will be directly responsible to implement the proposed project activities in field. An interdisciplinary team consisting agri expert, livestock and fodder expert, water and engineering expert ,social scientist and community mobilizers will be formed to directly implement project activities in 10 villages as per plan .The quality of program interventions and project effectiveness will be ensured by facilitating visits of BAIF and BIRD-UP’s technical team .

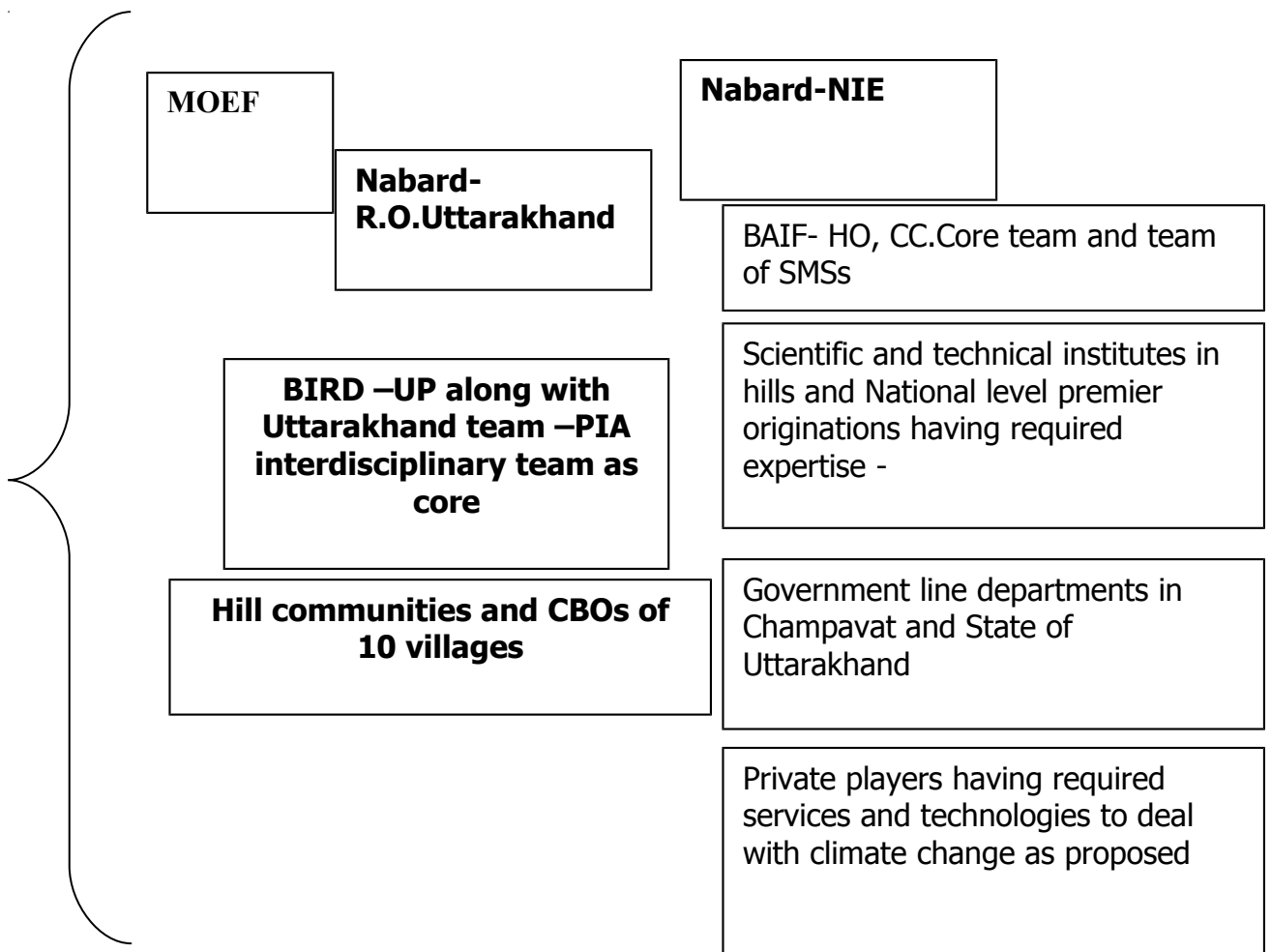
As a strategy linkages will be developed with premier national and local scientific and technical institute, which are concerned and have mandate of development in Mountains. VIPKAS – Almora, GB Pany Institute Of Himalayan Environment and Development, Garhwal; Dr.Y.S. Parmar University Of Horticulture & Forestry- Solan; Central Soil and Water Conservation Research and Training Institute (CSWTRI), National Remote Sensing Centre (NRSC) etc are some of the Institutes.

Table 12: Responsibility matrix:

Program activity	Responsible agency and collaborator
Adaptation fund board	Overall direction and shaping up of actions in Indian hotspots and vulnerable areas
MOEF	Overall guidance at National level and facilitation to achieve better synergy at national level

NABARD	Technical oversight, Quality control Supervision, monitoring, steering of projects and ensuring effective delivery through network programs
NABARD RO- Uttarakhand	Direct contact point for Uttarakhand project facilitation –Link between HO and PIA
BIRD –UP	Program implementing agency for this project proposed in Uttarakhand district , Training and capacity building
Uttarakhand team through HO at Haridwar	Direct implementation of activities as proposed
BAIF HO	Required inputs and guidance for project with active involvement of climate change core team members and other Subject matter specialists
Local development agencies and technical organizations	Technical inputs and convergence help for similar programs focusing climate change adaptation
Local community	Main stakeholder of project and direct ownership of program actions.

Fig 4: Organogramme of the executing agents and how they report to each other.



B. Describe the measures for financial and project / programme risk management.

Risk Class/Category	Level	Mitigation .
Financial: Cost escalation leading to increased costs for goods and services	Low	The current schedule of rates and wage rates have been used in estimating the budget and as such it is expected to take care of the implementation as per the phasing proposed.
Environmental: Natural hazards (flood, drought, storm surges, storms) may hamper project implementation.	Moderate to High	The programme is seeking to reduce the effect of natural hazards. However, certain activities will be at risk particularly in the early phases of implementation.
Operational/Administrative: loss of technical staff; coordination of activities with other agencies; large number of on-going projects/programme	low	BIRD –UP and Uttarakhand have earmarked a dedicated team. The required man power can also be drawn from other offices of BAIF.
Participation of stakeholders	Low	The project activities are highly relevant to the stakeholders . With proper community mobilization and formation/strengthening of of groups, participation could be ensured.

C. Describe the measures for environmental and social risk management, in line with the Environmental and Social Policy of the Adaptation Fund.

Risk Class/Category	Level	Mitigation
Project neglects the principles such as access and equity	low	The project activities are aimed at vulnerable and agriculture dependent households from the selected region. All the participating families thus have equal chance of gaining from proposed adaptation activities.
Project neglects marginalized and vulnerable groups / deny gains	low	The project is aimed at reducing the drudgery and vulnerability of agriculture dependent hill communities. The activities will help creating long term asset base in villages, enhanced natural resource base and also will help creating livelihoods and income for local inhabitants including marginalized and vulnerable groups such as women, children, elders, handicapped persons etc

Project does not protect natural habitats / alters landscapes and natural heritages	low	The proposed project activities will not have any adverse impact on natural habitats of will not alter landscapes and natural heritages.
Project poses threat to existing biodiversity in agriculture	low	There is specific project component which aims at conserving and multiplying the agro biodiversity of Himalayan food crops for food security and risk mitigation
Project does not guarantee gender equity / gender empowerment	low	The project is proposed for agriculture dependent community. In hills, women bear the responsibility of agriculture and livestock activities. They are thus the main beneficiaries of this project. Some of the interventions like formation/strengthening of SHGs, training and capacity building of SHGs etc are exclusively aimed at empowering the hill women both socially and economically.
Project violates human rights	low	The project does not violate any human right. Wherever, labour oriented activities are taken up, it will be ensured to provide minimum wage as guaranteed by Centre/State governments.
Project neglects indigenous people and leads to displacement	low	The project area doesn't have indigenous population.
Project activities are not environmentally sound/ not climate smart	mini mum	Most of the activities proposed are environment friendly. However, care will be taken while operationalizing to cause minimum impact / adverse effect to environment.
Project does not comply to social and environmental law and commitments of country and sub regions.	mini mum	The project activities are planned keeping in view various social and environmental law and commitments of India and Uttarkhand state.

D. Describe the monitoring and evaluation arrangements and provide a budgeted M&E plan.

Based on the result framework presented below, a Monitoring and Evaluation system will be prepared. The system will encompass a clear data collection and compilation plans for monitoring qualitative as well as quantitative results indicators using appropriate methods and tools. Data will be collected periodically at specified intervals and analyzed to track the progress. As a prerequisite, baseline database will be created during the beginning of the project implementation to compare the changes taking place due to project interventions. Work plans with clear targets, time line and budgets will be prepared and executed to accomplish the results. A three tier system will be followed to review the progress and reflect critically to ensure effective and effectiveness of the programme interventions. At the village level participatory monitoring will be done by community and implementing staff. At the district level coordinator

will conduct monitoring meetings with implementing staff and community representatives and at the state level the Programme Director, BIRD-UP will monitor and review the work progress as well the results with coordinators and implementing staff. Community representative shall attend the monitoring meeting to share their views and inputs. At all levels monitoring will ensure that the activities planned are completed and the results are achieved. In case of variation decisions to improve the performance will be made in the quarterly meetings by analyzing the results. Monitoring reports will be prepared based on the analysis and will incorporate the challenges and internal and external difficulties encountered during implementation of activities and in monitoring process. Strategies to overcome the challenges and difficulties to be evolved during the review meetings at each level. The reports will be shared with different stakeholders for various uses. The Programme Director will attend the quarterly meeting to be aware of the trends and also to ensure the quality of analysis done in the meetings. The quarterly progress report prepared based on the monitoring meeting will be sent to the Programme Director. A copy of the report will be given to the village level organization for their records.

Annual impact assessment will be done internally while midterm review and final evaluation will be carried out by utilising external evaluators. Besides, annual field visit will be undertaken by the Programme Director. A detailed budget for undertaking monitoring and evaluation plan is given below:

Monitoring and evaluation plan Activity	Responsible person	Budget (US\$)	Time frame
Inception workshops	Programme Director	833	Within 2 months of project starting and yearly thereafter
Inception report	Programme Director	0	Within 2 months of project starting
Annual impact Assessment	Programme Director	0	Annual
Bi-annual Progress Reports	Programme Director	0	6 monthly
Quarterly Progress Reports	Programme Director and Project Site Co-ordinator	0	Quarterly
Participatory Monitoring and Evaluation by beneficiaries	Programme Director	0	Quarterly
Annual field visits by representatives of Programme Advisory Committee	Programme Director	1,000	Annual
Minutes of Advisory Committee Meeting	Programme Director	0	Quarterly

Technical Reports	External consultant	0Periodic
Mid-term Evaluation	External consultant	3,333Mid term
Final evaluation	External consultant	6,667 months before end of project
Audits	External auditor	333Every Year
Total		12,166

E. Include a results framework for the project proposal, including milestones, targets and indicators.

Component 1: Participatory assessment of climate risks, vulnerabilities and future climate change scenarios					
Outcome 1: Quantification of risk and vulnerability mapping of target group					
Activity	Output	Indicator	Target	Baseline	Means of Verification
Baseline study	Participatory assessment of climate risks, vulnerabilities and projection on future climate change scenarios	Data/feedback regarding temperature and rainfall and their variability and their impact on agricultural production and productivity	Baseline studies in 800 households in Chamapavat district of Uttarkhand	The historical data on vulnerability and risks are not available.	Fall in production and productivity of agricultural commodities grown in the area.
Component 2: Strengthening and building Community Based Organisation					
Outcome 2: 50 Self Help Groups/Producers Organisations will be created					
Conduct village meetings and motivate the farmers and persons with other livelihood to form groups.	More than 100 meetings of farmer's and dairy professionals etc.	No. of meetings conducted	Formation/strengthening of 50 Community based groups	No or very few CBOs	Registers and Minutes of meeting of groups
Component 3: Building resilience for climate change					
Outcome 3: Climate resilient through training					
Activity	Output	Indicator	Target	Baseline	Means of Verification
Climate resilience through Capacity Building	Communities trained on adaptation measures	Communities better equipped to face climate hazards in future	Training of SHGS/POs (50 Nos), Training of local cadre of technicians (10 Nos), Skill training (50 Nos) and exposure visits (20 Nos)	Communities are ill equipped to face climate hazards	Number of training programmes conducted & Increase in per capita income in the project area.
Component 4: Disaster Risk Reduction & Contingency Planning					
Outcome 4: Making vulnerable communities resilient to disaster					

Activity	Output	Indicator	Target	Baseline	Means of Verification
Preparing a plan for Disaster risk reduction	Weather forecast and SMS based advisory, early warning signals, village level seed banks, fodder banks and weather stations (1 No) and weather service centres (5 Nos)	Comparatively less loss of crops and live stocks due to disaster like cyclone, flood, drought etc	800 households	High risk to crops and live stocks and livelihood due to disasters	Crop loss and livestock loss data due to disaster in the pre and post project scenario.
Component 5: Building resilience for climate change					
Outcome 5: Climate resilience through climate smart agriculture and allied practices					
Activity	Output	Indicator	Target	Baseline	Means of Verification
Climate smart agricultural practices and innovations (Fruit crops requiring low chilling conditions, techniques for propagation of saplings and protected cultivation of vegetables promoted so as to withstand climate variability.)	Introduction of niche fruit crops, innovative propagation, protected cultivation & fodder resource development	Climate resilient fruits and vegetable and fodder crops	Improved seed & vegetables (800 families), fruit trees (600 families), protected cultivation (100 nos), seed bank (5 nos), organic farming (400 families), nursery (10 nos), bee keeping (300 nos), in-situ grafting (30 nos)	The diverse food Crops once available in Mountains and knowledge about traditional coping mechanism are slowly getting extinct.	Number of crops Identified and sapling provided. Number of seeds Revived, multiplied and conserved. Number of community seed banks established
Strategic water reserve creation through rain water and spring rejuvenation water harvesting	Rainwater harvesting structures, spring rejuvenation and storage structure	Round the year assured availability of water for drinking and irrigation	Roof water harvesting (community-5 nos & individual-100 nos), spring rejuvenation (8 Nos) and Drip/sprinkler	Water, both for Drinking and Irrigation is emerging as Threat in hills	Comparison of pre and post project number of water structures, cropping intensity, crop productivity and time taken by women to fetch

			(125 nos)		drinking water in their villages.
Livestock and fodder development as an income diversification option	Livestock resource centric climate smart interventions such as improved management, health care and climate smart housing	Better managed livestock resources, Enhanced income from livestock	Livestock management (1500 nos), fodder plantation (20 ha), screening & documentation of native fodder trees (1 no), poultry (40 units), cold water fisheries (25 nos)	Livestock, though Important Livelihood source for hill families, it's potential has not been properly exploited as Income source	Number of Climate smart Housing for Livestock Established, health parameters of animals, photos, progress report
Component 6: Knowledge Generation and Management					
Outcome 4: Preparing and disseminating evidence based resilient climate change adaptation strategies in Hill areas.					
Activity	Output	Indicator	Target	Baseline	Means of Verification
Project Benefit Assessment	Project benefit in terms of quality and quantitative achievement recorded	Qualitative & quantitative project benefit indicators	Two structured assessment	Performance parameters more from production and not from climatic issues	Assessment report
Knowledge management, documentation , dissemination sharing	Process documentation and using existing platform for sharing the learning	Better understanding of different other stakeholders and their awareness	Case studies (20 nos), impact assessment/fact sheets (10 nos)	Lack of evidences On climate Adaptation Approaches in hill Context	Reports Fact sheets Website contents Thematic research

F. Demonstrate how the project / programme aligns with the Results Framework of the Adaptation Fund

Project Objective	Project Objective Indicators	Fund Outcome	Fund Outcome Indicator
OBJECTIVE 1 To enhance disaster preparedness of the hill community through vulnerability assessment and timely dissemination of weather information.	Conduct of baseline study	Quantification of risk and vulnerability mapping of target group	Risk and vulnerability assessment report
OBJECTIVE 2: To enhance resilience of mountain communities and their livelihood support systems by building local level institutions and their capacity	No. of meetings conducted to form groups	Formation/strengthening of 50 Community based groups	No of Community based groups formed.
OBJECTIVE 3: To demonstrate context specific technology packages for adoption of climate smart agri practices and innovations combining suitable sectoral interventions on farmers' fields and community land.	Introduction of niche fruit crops, innovative propagation, protected cultivation & fodder resource development	Climate resilient fruits and vegetable and fodder crops	No of families with Improved seed & vegetables ,fruit trees ,protected cultivation, seed bank , organic farming, nursery ,bee keeping , in-situ grafting
OBJECTIVE 4: To conserve and use water judiciously through appropriate techniques and practices.	Rainwater harvesting structures, spring rejuvenation and storage structure created.	Round the year assured availability of water for drinking and irrigation	Number of roof water harvesting , spring rejuvenation structures created and number of Drip/sprinkler system introduced

Project Outcomes	Project Outcome Indicator (s)	Fund Output	Fund Output Indicator
Quantification of risk and vulnerability mapping of target group	Participatory assessment of climate risks, vulnerabilities and projection on future climate change scenarios	Data/feedback regarding temperature and rainfall and their variability and their impact on agricultural production and productivity	Baseline studies in 800 households in Chamapavat district of Uttarkhand
50 Self Help Groups/Producers Organisations will be created	More than 100 meetings of farmer's and dairy professionals etc.	No. of meetings conducted	Formation/strengthening of 50 Community based groups
Climate resilient through training	Communities trained on adaptation measures	Communities better equipped to face climate hazards in future	Training of SHGS/POs (50 Nos), Training of local cadre of technicians (10 Nos), Skill training (50 Nos) and exposure visits (20 Nos)
Climate resilience through climate smart agriculture and allied practices	Introduction of niche fruit crops, innovative propagation, protected cultivation & fodder resource development	Climate resilient fruits and vegetable and fodder crops	Improved seed & vegetables (800 families), fruit trees (600 families), protected cultivation (100 nos), seed bank (5 nos), organic farming (400 families), nursery (10 nos), bee keeping (300 nos), in-situ grafting (30 nos)
	Rainwater harvesting structures, spring rejuvenation and storage structure	Round the year assured availability of water for drinking and irrigation	Roof water harvesting (community-5 nos & individual-100 nos), spring rejuvenation (8 Nos) and Drip/sprinkler (125 nos)
	Livestock resource centric climate smart interventions such as improved management, health care and climate smart housing	Better managed livestock resources, Enhanced income from livestock	Livestock management (1500 nos), fodder plantation (20 ha), screening & documentation of native fodder trees (1 no), poultry (40 units), cold water fisheries (25 nos)
Preparing and disseminating evidence	Process documentation and using existing	Better understanding of different other	Case studies (20 nos), impact assessment/fact

based resilient climate change adaptation strategies in Hill areas	platform for sharing the learning	stakeholders and their awareness	sheets (10 nos)
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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.

I	PROJECT COMPONENTS	UNIT	QUANTI TY	Rate in US \$	Amount in US \$
1	Baseline studies	Nos	800	0.85	680
2	Trainings and capacity building measures				37,500
A	Training of Self Help Groups/Producer Organisations	Nos	50	250	12,500
B	Training of local cadre of technicians	Nos	10	167	1670
C	Training on Soil & Water conservation, agriculture, livestock etc	Nos	30	333	9990
D	Exposure visit	Nos	20	667	13,340
3	Formation and strengthening of local institutional base				7,500
A	Formation/ Strengthening of SHG/ Farmers Club/ Water user association	Nos	50	50	2,500
B	Processing unit	Nos	1	5000	5,000
4	Disaster preparedness, contingency planning and best practice adoption				13,310
A	Vulnerability assessment	Nos	20	150	3,000
B	SMS based advisories	Nos	800	3.5	2,800
C	Weather station establishment	Nos	1	3335	3,335
D	Weather services	Nos	5	835	4,175
5	Climate smart agri practices and innovations				153,431
A	Introduction of Water stress tolerable crops (Improved Seed)	Famil y	800	8.3	6,640
B	Fruit tress saplings & Manure & watering measures	Famil y	600	83.3	49,980
C	Improved vegetable cultivation	Famil y	800	16.67	13,336
D	Protected cultivation	Famil y	100	333	33,300
E	Conservation of agro-bio diversity & Community seed bank	Villag e	5	1667	8,335
F	Promotion of organic farming	Famil	400	50	20,000
G	Establishment of Nursery	Nos	10	833	8,330
H	Bee Keeping	Famil	300	41.7	12,510

I	In-situ grafting	Nos	2000	0.5	1000
6	Strategic water reserve creation				215,800
A	Roof Top Rain water Harvesting (individual)	Nos	100	500	50,000
B	Roof Top Rain water Harvesting (Community)	Nos	5	835	4,175
C	Natural Spring Rejuvenation	Nos	8	15000	1,20,000
D	Innovative water use efficiency demos (Drip/Sprinkler)	Nos	125	333	41,625
7	Livestock and fodder development				72,795
A	Livestock Management Practices	Family	800	41	32,800
B	Fodder Plantation (Grass/ Trees)	Ha	20	333	6,660
C	Screening & documentation of native fodder trees	Nos	1	835	835
D	Promotion of Poultry	Family	40	500	20,000
E	Promotion of cold water fisheries	Family	25	500	12,500
10	Knowledge management, documentation and dissemination				16,495
A	Tablet for survey	No	5	165	825
B	Case studies and documentation	No	20	167	3,340
C	Impact assessment/ Fact sheets	No	10	333	3,330
D	Process documentation on building local level adaptive capacities	No	10	167	1,670
E	Disaster preparedness plan of project villages	No	10	333	3330
F	State/National Workshops	No	5	800	4,000
11	Project/Programme Execution Cost				54,366
A	Monitoring and Evaluation Budget				12,166
B	Project/Programme Management Cost				42,200
12	Total Project/Programme Cost				5,71,877
13	Project/Programme Cycle Management Fee				48,610
14	Amount of Financing Requested				6,20,487

BUDGET NOTES:

1. **Roof top rain water harvesting (Individual):-** Average rainfall in Uttarakhand is 1523 mm which is spread over approx. 100 days in a year. Water crisis is generally during March 15 to June 15. The unit cost per structure is USD 500. The break up cost includes USD 25 for preparation of roof top, USD 50 for installation of collection pipes, USD 17 for gravel filter and USD 408 for construction of underground water storage tank (capacity approx 15000 L.)
2. **Roof top rain water harvesting (Community):-** The unit cost per structure is USD 835. **The break-up includes** preparation of roof top – USD 42, installation of collection pipes – USD 50, gravel filter- USD 25 and construction of water storage tank (20000 L) capacity -718.
3. **Natural spring rejuvenation:-** The natural springs which are also a major source of water in hill areas are affected by climate change. Springs have become dry/ near to dry. Out of various technologies developed to recharge these natural springs, it is proposed to use isotope technology to identify recharge zone. Treatment for recharge with water conservation measures (digging pond, trench and plantation etc.) - USD 250 per hectare. For one spring it is needed to treat about 60 hectare land. Total cost for rejuvenation of one spring is USD 15000.
4. **Life saving irrigation techniques (Drip/ Sprinkler):-** On the backdrop of climate change it is necessary to use water efficiently by promoting drip/ sprinkler technology that is known for efficient water uses. These units will be connected with roof top water harvesting tanks. The unit comprises of Chaffin/ sprinkler, pipe (32mm & 16mm), screen filter, Joiner, compression valve etc. These units will be installed on 2 hectare cultivable land and the cost comes to USD 333 per unit.
5. **Introduction of water stress tolerant crops:-** . It is needed to introduce crops like Amaranths, Soybean, Buck wheat, Oat etc. These crops give good income to the farmers in the condition when there is low rain. This will be done by introducing seeds of improved varieties @ USD 8.3 per family.
6. **Fruit trees saplings, manure & watering:-** It is proposed to acquaint farmers about tree based farming system which is advantageous over mono cropping in the climate change scenario. It is proposed to provide 40 saplings of fruit trees per family. Total cost works out to USD 83.3. Break up is plantation on the bunds (USD 26.67); pit digging (USD 20), manure (USD 10), watering (USDS 16.67) and maintenance for 2 years (USD 10).
7. **Improved vegetable cultivation:-** In the hill area farmers have small landholding and their livelihood is mainly dependent on agriculture. It is proposed to train farmers in vegetable cultivation to earn good income per unit of land. It is proposed to provide seeds of Tomato, Cucumber and Capsicum etc. to the farmers with scientific POP. The cost estimated is USD 16.67 per family.
8. **Farming under protected cultivation with irrigation facility:-** In the hill area environmental conditions may suddenly change and go beyond control. To protect the crop from these sudden changes of environment, it is needed to increase the protective culti-

vation under poly house. Bamboo based poly houses are planned to reduce initial cost. The life expectancy of this structure is five years. During the project period a local cadre will be trained for manufacturing of these poly houses. An irrigation tank with the capacity of 5000 is also considered with the unit. For this intervention USD 333 is proposed. The break up is UV stabilized poly sheet (USD 117), Bamboo (USD 83), transportation & labour (USD 50), bricks & cement (USD 83).

9. **Conservation of agro-bio diversity & community seed bank:-** Himalaya is amongst one of the mega diversity zone of the world. There are many landraces of pulses & millets available. As some land race are going to extinct. It is needed to conserve these landraces for future use. The activity is to be implemented by participatory approach in which sub activities included are collection, fairs, Pot cultivation, Field cultivation, seed banks etc. The amount proposed for these activities is approx USD 1667 per year.
10. **Promotion of organic farming:-** Training & demonstration of LEISA techniques to farmers for better soil health & sustainable yield. This will reduce dependence on high external inputs. For vermi composting/ composting/ Vermi wash etc expenditure will be USD 33.4, for Jeevamrut (USD 8.3) and for Dasparni Ark (10 leaves extract) USD 8.3
11. **Establishment of nursery:-** Availability of good quality grafts/ saplings is a major issue in the area. Community level nurseries of vegetable & fruit trees are needed to overcome this issue. Expenditure will be on preparation of shade net house (USD 250), construction of small poly house (USD 167), mist chamber (USD 33.3), seed/ scion procurement (USD 167), poly bags/ propagation tray/ filling materials (USD 217).
12. **Bee Keeping:-** Bee keeping (*Apis cerana indica*) is populated in the hill area. Due to losses in their traditional habitat and introduction of European bees *Apis mellifera*, this species are not available for pollination in the season. It is needed to promote Indian bees with their traditional system of housing for better pollination. Expenditure will be occur to make traditional hives with newer technological intervention is USD 42.
13. **In-situ grafting:-** At various places in hill area survival of grafted sapling is very difficult due to low soil depth. At such places we propose to place seeds of wild/native spp. and later put grafts when they become one year old. Cost includes USD 0.08 for seed and plantation, USD 0.33 on manuring & watering and USD 0.08 on grafting.
14. **Livestock management practices:-** Breed improvement with better management practices is needed for hill area for better productivity of livestock. Expenditure will occur on Artificial insemination (USD 8.3), quarterly deworming & mineral mixture (USD 16.67) and primary veterinary support (USD 16.67). This will helpful to strengthen livestock rearing as a sustainable source of income for rural hill people.
15. **Fodder plantation (Grass & trees):-** In the hill areas there is acute scarcity of fodder for livestock. It is needed to plant various fodder trees & grasses on their waste land for better fodder availability and also to increase green area. In one hectare USD 167 will be expend on

purchase of saplings of trees & grass and USD 167 for manuring, water conservation, watering and fencing etc.

16. **Screening documentation of native fodder trees:-** In the Himalaya various type of trees are used for fodder from decades. Due to changing climate these trees are going to extinct. It is needed to identify these trees and properly document their uses for future use. Screening of these trees (USD 333) and preparation of document (USD 500).
17. **Promotion of Poultry:-** Poultry rearing is a profitable venture for the hill area. It gives better income to the farmers and sustains their livelihoods. With innovative techniques of rearing and feeding it gives success to the farmers. Housing structure (USD 250) and chicks, drinker, feeder, feed and medicines for 2 cycles (USD 250).
18. **Promotion of cold water fisheries:-** Promotion of cold water fisheries increase the income of the farmer and reduce dependency of farmers on other natural resources. Construction pond (USD 417) and fingerlings and other materials (USD 83).
19. **Formation/ strengthening of SHG/ Farmer club/ Water user association:-** For better capacity building of the farmers it is needed to group the farmers. It is proposed to use approximately USD 50 per group for their capacity building, registration etc.
20. **Processing Unit:-** For better income of the farmers it is needed to add value to their produce. Majority of expenditure (USD 5000) will be for purchasing of various machineries for processing unit.
21. **Vulnerability assessment:-** In the initiation of the project it is needed to make a vulnerability assessment for each villages. During the assessment a team of experts will interface with the villagers. USD 100 is budgeted for meeting with villagers and USD 50 on documentation and other expenditures.
22. **Weather station establishment:-** For forecasting of weather and early warning system it is needed to establish a weather station in the area. The estimated amount is USD 3333 for purchase of equipments and construction.
23. **Weather services:-** For analysis of the data and producing various services related to weather consultant firm will be hire for the area. They will provide forecasting and other related services to the farmers during the project period. An amount of USD 833 is estimated.
24. **SMS based early warning system:-** Due to unexpected weather condition crops and other livelihood intervention are affected. It is needed to establish an early warning system for the area that gives alerts and advice to the farmers. A total cost of USD 2800 @ USD 3.5 per connection for 800 families, is estimated towards this.

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

	Upon Agreement signature	One Year after Project Start ^{a/}	Year 3 ^{b/}	Year 4	Year 5 ^{c/}	Total
Scheduled Date	30th July 2014 / Date of receipt of first installment / electronic transfer	30th July 2015	30th July 2016	30th July 2017	30th July 2018	
Project Funds	85780	171500	171500	85780	57317	571877
Implementing Entity Fee	7290	14500	14500	7290	5030	48610
Total	93070	186000	186000	93070	62347	620487

^{a/}Use projected start date to approximate first year disbursement

^{b/}Subsequent dates will follow the year anniversary of project start

^{c/}Add columns for years as needed

Instalment No.	Amount (\$)	Year	Milestone
First Instalment	93070	July 2014	<ul style="list-style-type: none"> • Completion of inception workshop • Selection of villages • Baseline studies, vulnerability assessment , risk and hazard mapping, listing coping strategies as per plan • Community level awareness generation, group formation, activity orientation • Selection of families and farms for suggested technology focusing agri/horti/live-stock/water/energy interventions.
Second Instalment	186000	April 2015	<ul style="list-style-type: none"> • Community level awareness generation, group formation , activity orientation • Start of works of climate smart agri practices, water reserve creation, live-stock & fodder development, eco-restoration and clean energy and completion of 20% physical units. • Establishment of weather station/centres and operationalisation

Instalment No.	Amount (\$)	Year	Milestone
			<p>of weather advisories</p> <ul style="list-style-type: none"> • Selection of landscapes – Vanpanchayats, spring networks and recharge zones for suggested area specific interventions and completion of 20% works • Exposure, capacity building and exchange events participation • Quarterly meetings (Four)
Third Instalment	186000	April 2016	<ul style="list-style-type: none"> • Full fledged disaster reduction and weather advisory services in place • Completion of 25% physical units of climate smart agri practices, water reserve creation, livestock & fodder development, eco-restoration and clean energy. • Completion of 25% of landscapes oriented community works • Exposure, capacity building and exchange events participation • Four monitoring (quarterly)
Fourth Instalment	93070	April 2017	<ul style="list-style-type: none"> • Completion of 30% physical units of climate smart agri practices, water reserve creation, livestock & fodder development, eco-restoration and clean energy. • Completion of 30% of landscapes oriented community works • Exposure, capacity building and exchange events participation • Four monitoring (quarterly) • Completion of mid-term review
Fifth Instalment	62347	Oct. 2017	<ul style="list-style-type: none"> • Completion of 25% physical units of climate smart agri practices, water reserve creation, livestock & fodder development, eco-restoration and clean energy. • Completion of 25% of landscapes oriented community works • Exposure, capacity building and exchange events participation • Four monitoring (quarterly)

Instalment No.	Amount (\$)	Year	Milestone
			<ul style="list-style-type: none"> • Knowledge products , documentation and dissemination • Preparatory work for terminal evaluation
		Mar 2018 Sept 2018	Project/Programme Closing Terminal Evaluation

ANNEXURE 1 – INDICATIVE LIST OF VILLAGES WHERE PROJECTED ACTIVITIES ARE PLANNED
 (*THE FINAL SELECTION MAY UNDERGO THE CHANGES BASED ON SELECTION CRITERIA

Brief profile of selected project villages

Sr. No.	Name of Village Panchayat	No. of Villages	Block	Families	Population SC	Total Population	No. of BPL Family	Land holding (acre)	Cultivable land (acre)	Waste land (acre)	No. of Vanpanchayat (Acre)
1	Suyal Khark	Suyal Khark	Champawat	125	Nil	600	103	305	105	200	3 (140)
		Punave									
		Churakhark									
2	Bhagana Bhandari	Barabati	Champawat	167	1022	1022	150	633.5	283.5	350	5 (807.50)
		Nariyal Gaon & Satera									
		Lamauti									
		Bhagana									
		Kanan									
		Kakhnula									
		Pathhao									
		Ambedkar Gaon									
3	Khark	Khalkhadia	Champawat	200	Nil	800	145	14875	7375	7500	4 (125)
		Bangadi									
		Khurk									
		Sania									
4	Haripur (Narsingh Rada)	NarSinghRada	Champawat	250	1100	1100	215	5500	3750	1750	1 (125)
5	Dingdai	Khunadi	Champawat	95	Nil	856	80	1855	667.5	1187.5	2 (4005.5)
		DhamiSaun									
		Dingdai									
6	Gosani	Pardhyani	Pati	404	118	1824	117	660.68	427.25	233.43	2(570.29)
		Kapri									
		Oli gaon									
		Sunar gaon									
		Karnatak gaon									
		Bhat gaon									
		Dindwal gaon									

7	Manar	Manar	Pati	104	Nil	579	48	311.5	242.71	68.79	2(325.50)
		Gambhirgao n									
8	Tapni Pal	Dicti	Pati	84	1	460	35	875.39	350.69	524.7	01(4.42)
		Kalakhark									
		Tapnipal									
9	Maragaon	Banj gaon	Pati	116	Nil	628	59	634.33	303.78	330.55	01(520.92)
		Sujan gaon									
		Bayal bunga									
10	Tyarson	Tyarson	Pati	91	109	467	21	354.1	216.17	137.93	01(126.30)