AFB/PPRC.17/14
18 September 2015

Adaptation Fund Board
Project and Programme Review Committee
Seventeenth Meeting
Bonn, Germany, 6-7 October 2015

Agenda Item 6 i)

PROPOSAL FOR NAMIBIA (3)

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 45 that regular adaptation project and programme proposals, i.e. those that request funding exceeding US$ 1 million, would undergo either a one-step, or a two-step approval process. In case of the one-step process, the proponent would directly submit a fully-developed project proposal. In the two-step process, the proponent would first submit a brief project concept, which would be reviewed by the Project and Programme Review Committee (PPRC) and would have to receive the endorsement of the Board. In the second step, the fully-developed project/programme document would be reviewed by the PPRC, and would ultimately require the Board's approval.

2. The Templates approved by the Board (OPG, Annex 4) do not include a separate template for project and programme concepts but provide that these are to be submitted using the project and programme proposal template. The section on Adaptation Fund Project Review Criteria states:

> *For regular projects using the two-step approval process, only the first four criteria will be applied when reviewing the 1st step for regular project concept. In addition, the information provided in the 1st step approval process with respect to the review criteria for the regular project concept could be less detailed than the information in the request for approval template submitted at the 2nd step approval process. Furthermore, a final project document is required for regular projects for the 2nd step approval, in addition to the approval template.*

3. The first four criteria mentioned above are:
   1. Country Eligibility,
   2. Project Eligibility,
   3. Resource Availability, and
   4. Eligibility of NIE/MIE.

4. The fifth criterion, applied when reviewing a fully-developed project document, is:
   5. Implementation Arrangements.

5. 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.

6. 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. The latest version of this document was launched in conjunction with the revision of the Operational Policies and Guidelines in November 2013.

7. 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 April 8, 2010.

8. 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.

9. The following fully-developed project document titled “Community-based Integrated Farming System for Climate Change Adaptation” was submitted by the Desert research Foundation of Namibia (DRFN), which is the National Implementing Entity of the Adaptation Fund for Namibia.

10. This is the first submission of the proposal. It was received by the secretariat in time to be considered in the twenty-sixth Board meeting. The secretariat carried out a technical review of the project proposal, assigned it the diary number NAM/NIE/Agri/2015/2, and completed a review sheet.

11. In accordance with a request to the secretariat made by the Board in its 10th meeting, the secretariat shared this review sheet with DRFN, and offered it the opportunity of providing responses before the review sheet was sent to the PPRC.

12. 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. In accordance with decision B.25.15, the proposal is submitted with changes between the initial submission and the revised version highlighted.

Project Summary

Namibia – Community-based Integrated Farming System for Climate Change Adaptation

Implementing Entity: *DRFN*
Project/Programme Execution Cost: USD 65,668
Total Project/Programme Cost: USD 691,244
Implementing Fee: USD 58,756
Financing Requested: USD 750,000

Project Background and Context:

Namibia is the driest country in Sub-Saharan Africa and has limited surface-water sources; more than 50% of water used in Namibia comes from an estimated 50,000 boreholes. The Otjozondjupa and Omaheke regions are overlain with deep Kalahari and rely solely on groundwater resources. With a recharge rate of about 1% percent, Namibia‘s groundwater resources requires judicious deep use, such as drip irrigation for croplands, efficient use of energy sources to abstract groundwater by using solar energy technologies. The project seeks to strengthen the resilience and adaptation of vulnerable communities to climate variability and climate change in the target regions of Omaheke and Otjozondjupa by diversifying livelihoods, increasing food security and adapting livelihood options to rainfall variability and climate change. The proposed action will diversify livelihood options in poultry, fruit production and irrigated horticultural production with concerted effort to strive for sustainability of production of these three components of the integrated farming system. Different options of value addition for poultry and fruit production will be investigated. Capacity building interventions will be implemented to enhance the knowledge and skills of farmers to manage the infrastructure and production. The proposed actions will specifically build on the existing village Water Point Committees (WPCs), which is the lowest community-level governance structure in villages and will be the direct operatives of the proposed actions. The project will directly benefit 564 people and indirectly benefit 30,053 people.

Components 1 and 3: Community mobilization, capacity building and strengthening current farming system (USD 55,800)

This component will help strengthening existing local level institutions through mobilisation and participatory project planning/implementation. Various participatory tools will be used to assess community livelihoods, especially considering livelihood resource ownership, control and access. Workshops will be held with the communities of the proposed two villages, which will help to map the livelihood systems and related asset base. To ensure gender equality, at community level, clear roles and responsibility schedules will be developed emphasising the roles of women to ensure the sustainability of the established structures. Water Point Committee members‘ empowerment workshops are also envisioned with focus on their capacity to plan, organise, and coordinate activities, including mentoring and evaluation processes. The project will also increase the resilience and food security of communities and households through increasing appropriate application of farming system on rangeland management and livestock production, capacity building and research for improved diversified livelihood and sustainable use of natural resources.

Component 2: Market research and value addition work (USD 80,207)

The project will undertake market research for the produce, combination of production and specific value addition. Activities will include identifying market opportunities, refining and evaluating marketing actions/plans. This will address issues of design/method need for the specific value addition and provide market opportunity. In addition to this the market research will also help organising and planning marketing process, and reviewing the business situation regularly.

Component 4: Implementation of Integrated Farming Systems (IFS) (USD 206,382)

The project will design and implement production system and infrastructure that respond climate change induced risks and build long-term resilience to climate change and improve livelihoods of community through diversified source of income and nutrition options. This will be done under a framework of decentralised adaptation planning. This component promotes integrated farming by combining crop, poultry and fruit production,.i.e a permaculture system (inter-linked sustainable environment and livelihood system). Inception workshops will be held with communities to clarify the benefit of the Integrated Farming System as source of income and ways to diversify livelihood; and also advantage of nutritional value from the vegetables and fruits. Following these inception workshops, implementation will be rolled-out. Irrigation infrastructure will be installed and, in determining the irrigated horticultural production suitability for the area, laboratory soil tests will be done. This will help to decide on the type of crops and weather condition of the area.

Component 5: Student involvement, capacity building and knowledge management (USD 283,187)

This component will help contribute to useful practical insight into the project management, application of appropriate technology and conduct research on integrated farming systems. It will promote communities participation and project sustainability, and create ways to transform information into knowledge accumulation. Awareness generation workshops will be held with the communities of the proposed two villages, which will help the communities to understand the climate related risks and hazards as well as the techniques available for minimising the risks involved. These introductory workshops will involve vulnerable community member that includes youth and women. A strong focus will be on involvement of students through internships and research projects (from both undergraduate and postgraduate students).

ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: Small-sized Project

Country/Region: **Namibia**
Project Title: **Community-based Integrated Farming System for Climate Change Adaptation**
AF Project ID: **NAM/NIE/Agri/2015/2**
IE Project ID: Requested Financing from Adaptation Fund (US Dollars): **750,000**
Reviewer and contact person: **Daouda Ndiaye** Co-reviewer(s): **Andrew Chilombo**
IE Contact Person: **Dr Martin Schneider**

Review Criteria	Questions	Comments on 22 August 2015	Comments on 12 September 2015
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. Namibia is the most arid country in sub-Saharan Africa, which is expected to go through increased temperature and soil evapo-transpiration in the next decades.	
Project Eligibility	1. Has the designated government authority for the Adaptation Fund endorsed the project/programme?	Yes. Dated 21 July 2015.	

	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?	The proposal promotes a community-driven integrated farming system in two villages in Namibia, in order to increase the adaptive capacity of the target communities. It will be executed by the Polytechnic of Namibia, to support village Water Point Committees (WPC) in operationalizing the system. Activities include community mobilisation and capacity building, implementation of integrated farming system and knowledge management. Overall, the adaptation reasoning of the project is not demonstrated. It focuses more on the agriculture aspect, without demonstrating how the activities will address the issues identified in the first section of the document, including the depletion of water resources and the increased bush encroachment affecting the availability of livestock grazing areas. **CR1** More clarity will be helpful to demonstrate better how the market research will support addressing adaptive capacity of concerned communities. In the same regard, more emphasis should be placed on IFS so that proposed actions sufficiently promote IFS in the target communities. **CR2**	**CR1**: Not addressed. Additional information has been given to rationalize the choice of the villages. However, no revision has been done to respond to the comment to strengthen adaptation reasoning and demonstrate how identified issues in the first section of the document would be addressed. The village selection criteria presented do not even relate to the project activities which do not address water availability or bush encroachment issues. Activity 3.3 which was just added is not explained enough and not linked to any existing output. **CR2**: Not addressed. The rationale for the market research and IFS is not clearly explained.

	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?	Not clear. The project makes mention of social, health, environmental and economic benefits to community members. Women and youth have been recognized. However there is a lack of information on the target villages and the number of people that would benefit directly or indirectly from the project, which needs to be provided at this stage. **CR3** Also, it would have been helpful to already identify exactly the roles that women and vulnerable communities will play in the components of the project and how they will benefit from it. Please, consider. **CR4** Lastly, the economic benefits need further demonstration, with estimate incomes provided. **CR5**	**CR3**: Addressed. **CR4**: Partially addressed. More information would be useful to show how women and vulnerable communities will be involved/engaged in administration and decision making processes, and the kinds of inputs they will be supplying. At this stage, there is need for more concrete direction and information. **CR5**: Addressed.
	4. Is the project / programme cost effective?	Not demonstrated. It is not clear against which paradigm and alternatives the cost effectiveness would be analysed. Given the lack of information on the adaptation issues to be addressed, and the lack of relevance of the alternative actions identified in this section, the cost effectiveness of the proposed project cannot be assessed. **CR6**	**CR6**: Not addressed.

	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?	The project is consistent with at least the fourth National Development Plan. However, most of the information provided in this section is not adequate. Several initiatives are presented here, that would fit under the section on "lack of duplication". Rather, it was expected that this section would demonstrate how this proposal is consistent with the relevant national and sectoral strategies, including strategies and plans related to climate change in Namibia. **CR7**	**CR7**: Not addressed. It is not clearly explained whether this project is only consistent with Climate Change Strategy and Action Plan, and no other plan or strategy.
	6. Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund??	Yes, the project recognizes 7 national Acts in compliance with the Fund's ESP.	
	7. Is there duplication of project / programme with other funding sources?	Yes, there is duplication with 2 Ministry of Agriculture, Water and Forestry projects. Overall, the lack of duplication is not demonstrated. In this section, the linkages and synergies with all relevant potentially overlapping projects / programmes need to be clearly outlined, including areas of overlap and complementarity, drawing lessons from the earlier initiatives during the project design, learning from their problems/mistakes, and establishing a framework for coordination during implementation. **CR8**	**CR8**: Not addressed. Table 7 is about demonstration of adaptation relevance to address national adaptation objectives, rather than about duplication/linkages and synergy as sought by the review comment.
	8. Does the project / programme have a learning and knowledge management component to capture and feedback lessons?	Not demonstrated. There is no consistency in the description of the components and figure 2. For example, the description names component 5 as Student involvement and capacity building, but the figure says knowledge. Please, clarify. **CR9**	**CR9**: Not demonstrated. Also, it is not clear how activities described in section G Part II of the proposal relate to component 5 of the project.

	9. Has a consultative process taken place, and has it involved all key stakeholders, and vulnerable groups, including gender considerations?	2 consultative sessions, of one day each, have been held in 2 locations that seem to be the target areas. Such process cannot be defined as comprehensive. Besides, the list of people who attended those sessions is not provided and information on gender groups and vulnerable communities' attendance is lacking. **CR10** Lastly, the objective and outcome of those consultations is not provided. **CR11**	**CR10**: Partially addressed. The list of attendance was not recorded for both consultations and information on gender is lacking. **CR11**: Addressed.
	10. Is the requested financing justified on the basis of full cost of adaptation reasoning?	The adaptation reasoning is not adequate. Although it is stated that the project will focus on community mobilisation, awareness raising and training to increase their resilience, this section does not demonstrate that the project/programme activities are relevant in addressing its adaptation objectives. **CR12**	**CR12**: Not addressed. The information provided is not relevant. The project document makes promises without demonstrating how those promises will be achieved. For example, it is not clear how the institutions at national level will provide supportive policy and regulatory environment and how the project will ensure community ownership when ways of engagement are not even clear.
	11. Is the project / program aligned with AF's results framework?	Yes, the project is aligned with the AF's results frameworks, and includes AF's outcomes 2,3 and 6 in its results framework	
	12. Has the sustainability of the project/programme outcomes been taken into account when designing the project?	Somewhat. However it is not clear how the results from this project will be replicated in other areas. The involvement of sector ministries and extension services need to be better explained in this section. **CR13**	**CR13**: Addressed.
	13. Does the project / programme provide an overview of environmental and social	Briefly. There is no sufficient information on the risks associated with the ESP principles nor is there an environmental and social	**CR14**: Partially addressed. The 15

	impacts / risks identified?	management plan or grievance mechanism laid out in this section. **CR14** **CAR1:** The proposal should state the category in which the screening process has classified the project/programme.	principles of the ESP are not informed. **CAR1**: Not 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?	Yes, the Implementing Entity Management Fee is at 8.5% of the total project budget before the fee.	
	3. Are the Project/Programme Execution Costs at or below 9.5 per cent of the total project/programme budget (including the fee)?	Yes, the Execution Costs are at 9.5% of the total project budget.	
Eligibility of IE	4. Is the project/programme submitted through an eligible Implementing Entity that has been accredited by the Board?	Yes. DRFN is an accredited NIE.	
Implementation Arrangements	1. Is there adequate arrangement for project / programme management?	Partially. The role of the executing entity, i.e. Polytechnic of Namibia, as well as NNFU or AgriFutura needs to be further clarified. **CR15** The role of the NIE is unclear, especially in the view of the section on Monitoring and Evaluation Arrangements. **CR16**	**CR15**: Partially addressed. Adequate information is not provided in the relevant section. **CR16**: Not addressed.
	2. Are there measures for financial and project/programme risk management?	Yes, the project identifies 7 risks, main risk factors and corresponding mitigation measures	

	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?	Not demonstrated. Please see above.	Partially addressed. The 15 principles of the ESP are not informed.
	4. Is a budget on the Implementing Entity Management Fee use included?	Yes, the use is included in table 18.	
	5. Is an explanation and a breakdown of the execution costs included?	No, only the figure is mentioned, but no explanation and breakdown are included. **CAR2**	**CAR2**: Not addressed.
	6. Is a detailed budget including budget notes included?	Yes.	
	7. Are arrangements for monitoring and evaluation clearly defined, including budgeted M&E plans and sex-disaggregated data, targets and indicators?	Yes. However the results framework will need improvement, in line with the changes requested above, to better reflect the project's adaptation-related objective, which does not currently translate in the document. **CR17**	**CR17**: Not addressed. The adaptation reasoning has not improved.
	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, the M&E framework needs to be clarified. It has to be redone to demonstrate how it will be utilized in the supervision of the project. It is very weak, and does not respond to this question. The information provided is very scarce and incomplete, and does not specify the roles of the different stakeholders in the monitoring and evaluation arrangements nor does it provide a broken down budget for the M&E. **CR18**	**CR18**: Not addressed. The M&E framework does not provide the adequate information.
	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?	The results framework does not include any of the core outcome indicators from the Fund's results framework.**CAR3**	**CAR3**: Not addressed. Please refer to AF document "Core indicator methodology" (http://www.adaptation-fund.org/wp-content/uploads/2015/01/AFB.EFC_.14.6%20Core%20Indicator%20Methodologies.pdf)

	10. Is a disbursement schedule with time-bound milestones included?	Yes.	

Technical Summary	The proposal promotes a community-driven integrated farming system in two villages in Namibia, in order to increase the adaptive capacity of the target communities. It will be executed by the Polytechnic of Namibia, to support village Water Point Committees (WPC) in operationalizing the system. Activities include community mobilisation and capacity building, implementation of integrated farming system and knowledge management. The initial technical review found that the proposal as it was presented did not meet the requirements of the Adaptation Fund, since a lot of information was missing in key sections, including the sessions relating to the compliance with the ESP of the Fund, the section on cost effectiveness or the one presenting the budget. More fundamentally, the adaptation reasoning of the project was not demonstrated. The proposal focused more on the agriculture aspect, without demonstrating how the activities would address the issues identified in the first section of the document, including the depletion of water resources and the increased bush encroachment affecting the availability of livestock grazing areas. Also, the budget structure was quite unbalanced between "concrete activities, i.e. the integrated farming system equipment (component 2, for US$ 206,776), and other "non-concrete" activities including capacity building, market analysis, community mobilization, student involvement… (components 1 and 3-5, for a total of US$ 418,800). A number of clarification requests (CRs) and corrective action requests (CARs) were subsequently made. The final technical review finds that many of the above requests were not adequately addressed. The following observations are made: a) To better demonstrate the adaptation reasoning, the proposal should further elaborate on how the proposed activities will address the issues identified, including the depletion of water resources and the increased bush encroachment affecting the availability of livestock grazing areas; b) The proposal should better demonstrate how the market research will support addressing adaptive capacity of concerned communities. In the same regard, more emphasis should be placed on integrated farming systems (IFS) so that proposed actions sufficiently promote IFS in the target communities; c) The proposal should provide more information on how women and vulnerable communities will be involved/engaged in administration and decision making processes, and the kinds of inputs they will be supplying;

	d) The proposal should clarify against which paradigm and alternative adaptation measures the cost effectiveness would be analysed, which is difficult to assess at this point given the lack of information on the adaptation issues to be addressed; e) The proposal should better demonstrate how it is consistent with the relevant national and sectoral strategies; f) The proposal should further demonstrate how it does not duplicate with other interventions and should outline the linkages and synergies with all relevant potentially overlapping projects / programmes, including areas of overlap and complementarity, drawing lessons from the earlier initiatives during the project design, learning from their problems/mistakes, and establishing a framework for coordination during implementation; g) The learning and knowledge management component of the proposal should be better described; h) The list of attendance for the consultations should be recorded and information on gender provided; i) The adaptation reasoning of the project should be better demonstrated. For example, it is not clear how the institutions at national level will provide supportive policy and regulatory environment and how the project will ensure community ownership in the absence of clarity on the intended ways of engagement; j) The proposal should better explain how it complies with the 15 principles of the ESP and should subsequently should state the category in which the screening process has classified the project/programme; k) The proposal should better describe the implementation and monitoring and evaluation arrangements; l) The proposal should provide explanation and a breakdown of the execution costs; m) In line with the changes requested above, the results framework should be improved, to better reflect the project's adaptation-related objective and should include at least one core outcome indicators from the Fund's results framework.
Date:	12 September 2015.

ADAPTATION FUND

PROJECT/PROGRAMME PROPOSAL TO THE ADAPTATION FUND

PART I: PROJECT INFORMATION

Project/Programme Category:	**Small Size Project Grant**
Country/ies:	**Namibia**
Title of Project:	**Community-based Integrated Farming System for Climate Change Adaptation**
Type of Implementing Entity:	**National**
Implementing Entity:	**Desert Research Foundation of Namibia**
Executing Entity/ies:	**Polytechnic of Namibia (transforming to the Namibia University of Science and Technology)**
Amount of Financing Requested:	**750 000 (in U.S Dollars Equivalent)**

Short Summary

The overall goal of this project to: ***strengthen the resilience and adaptation of vulnerable communities to climate variability and climate change***. The goal will be achieved through community mobilisation and capacity building (Component no. 1), market research (Component no. 2), strengthening communities' capacity to manage rangeland and livestock production (Component no. 3), implementation of integrated farming systems (Component 4) and, students involvement and capacity building (Component no 5).

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

AF	:	Adaptation Fund
CBA	:	Community-Based Adaptation Programme
CBEND	:	Combating Bush Encroachment for Namibia‘s Development
CCA	:	Climate Change Adaptation Project
CONTILL	:	Conservation Tillage Project
CPP ISLM	:	Country Pilot Partnership for Integrated Sustainable Land Management
DRWS	:	Directorate of Rural Water Supply
DYET	:	Directorate of Youth Employment and Training
ENSO	:	El Niño-Southern Oscillation ()
ERB	:	Ephemeral River Basins
FIRM	:	Forum for Integrated Resource Management
GEF	:	Global Environment Facility
IFS	:	Integrated farming system
MAWF	:	Ministry of Agriculture, Water and Forestry
MET	:	Ministry of Environment and Tourism
NDP	:	National Development Plan
NIE	:	National Implementing Entity
SGP	:	Small Grants Programme
UNCCD	:	UN Convention to combat Desertification
UNCCD	:	United Nations Convention to Combat Desertification
UNDP	:	United Nations Development Programme
WPC	:	Water Point Committee

1. PROJECT BACKGROUND AND CONTEXT

Outline relevant climate change scenarios according to best available scientific information. Outline the economic social, development and environmental context in which the project/programme would operate

Namibia is the driest country in Sub-Saharan Africa. Rainfall decreases from the north-eastern parts of the country (Zambezi region) towards the south and west, ranging from 700 mm to less than 50 mm annual rainfall. Only 8% of the country receives more than 500 mm – the minimum rainfall considered viable for dryland cropping. Mean annual temperatures in the interior of the country are mostly between 20^{o}C and 25^{o}C, but range from below freezing in winter to above 40^{o}C in summer. The rate of evaporation is very high, causing water deficits in all regions of Namibia. In the northern parts of the country evaporation from open water sources is estimated at 2.6 m (420% in excess of rainfall) and 3.7 m (1 750% in excess of rainfall) in the south of the country (Brown, 1990). Overall, 69% of the country is regarded as semi-arid (250 mm to less than 500 mm annual rainfall), 12% is hyper-arid (less than 50 mm), 16% is arid (above 50 mm to less than 250 mm) and only the remaining 3% in the north-east is semi-humid (Barnard, 1998).

About 70% of the 2.2 million population of Namibia lives in rural areas (NSA, 2011), and relies heavily on livestock production and dryland cropping. Repeated dryland cropping over the years has resulted in depletion of soil nutrients and widespread soil degradation much of in the northern regions of the country. In the semi-arid regions of the country, in which the proposed project is located, dryland cropping is very minimal and a highly risky business due to high rainfall is variability, while livestock production has contributed to bush encroachment, overgrazing and desertification. The rural livelihood has become very insecure. Droughts are recurrent. Some regions of the country have experienced drought conditions over the past four years. 2013 was Namibia‘s driest year over the past 30 years, while rainfall variability was the highest in 2015 rainfall season.

Namibia‘s HDI value for 2013 was 0.624 — which placed the country in the medium human development category, thus positioning the country at 127 out of 187 countries (UNDP, 2014). Despite being classified as a middle-income country, Namibia has one of the highest income inequalities in the world, with a Gini coefficient of 0.6. It is estimated that 27.6% of the population is poor, with 13.8% severely poor (WHO, 2013). Poverty levels and unemployment rate is the

highest in rural areas, especially among women and youth. Droughts and rainfall variability is a key driver of food insecurity in rural areas.

Assan (2014) reported that Southern Africa is among the most vulnerable regions to climate variability and change, due to multiple climatic stresses and low adaptive capacity. It is now indisputable that climate change will have a grave effect on livestock production; threatening the sustainability of livestock production systems by reinforcing existing stressors such as heat stress, droughts, and flooding events which have led to reductions in livestock productivity.

Temperature changes: over the long-term Namibia has experienced a mean decadal temperature increase of 0.2ºC (Reid et al. 2007). This is estimated to be about three times the global mean (*ibid*). The Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC 2001) states that climate change scenarios indicate a future warming of 0.2 to 0.5 °C per decade across Africa. This warming is greatest over the interior of semi-arid margins of the Sahara and central Southern Africa. Hudson and Jones (2002) predicted a 3.7°C increase in summer mean surface air temperatures and a 4°C increase in winter by the 2080s. In Namibia itself, predictions for temperature increases by 2100 range from 2 to 6°C (Government of Namibia 2002).

Changes in precipitation: reduced precipitation for Southern Africa is predicted in the next 100 years and most models project that by 2050 the interior of Southern Africa will experience significant decreases during the growing season (IPCC 2001). In Namibia, rainfall reductions are expected to be greatest in the northwest and central regions. Particularly strong reductions are expected in the central areas around Windhoek and surrounding highlands (Midgley*et al*. 2005). Both rainfall and temperature in Namibia are sensitive to the El Niño-Southern Oscillation (ENSO) effect, and rainfall is below average during El Niño conditions. Rainfall in the future is projected to become even more variable than at present (Government of Namibia 2002). The north-western part of the country has experience persistent droughts over the past four years, while the north-central parts have experienced both droughts and floods in recent years. 2013 was the driest year in the last 30 years, while rainfall variability was the highest in 2014-2015 rainfall season was January and February experiencing dry conditions. February is usually the wettest month.

Changes in evaporation: an increase in evaporation rates due to temperature increases is expected. Anincrease in evaporation of about 5 per cent is expected per degree of warming (Government of

Namibia 2002). Thus, Namibia is predicted to experience severe water deficit. This will affect dryland crop production and livestock production – which are the main sources of livelihood for the poor rural population.

Effects of Climate Change on the Project area and implications on Livelihoods

The rural communities, whose livelihoods depend on natural resources, are facing greater uncertainty than ever before. Climate change has resulted in increased mobility of pastoralists in search for pastures – this will lead to resource conflict. Table 1 below summarises projected adverse effects of climate change on the inhabitants of Otjozondjupa and Omaheke regions of Namibia were the proposed project sites are located.

Table 1: Adverse effects of climate change on the rural communities of Otjozondjupa and Omaheke regions

Specific Climate Change-related Changes	Specific Adverse Effects
Declining rainfall: - Frequent droughts - Increased spatial and temporal variability of rainfall season	- Decline in livestock forage leading to lower rangeland carrying capacity, causing livestock deaths and low livestock numbers; with possible loss of livelihoods and income. - Increased migration of pastoralists to districts that receive relatively higher rainfall in a particular rainy season. - Increased resource conflicts
Rising temperature - Prolonged dry spell between rainfall events - High incidence of heat waves	- Increased seedling mortality of crops and pasture following a prolonged dry spell. - Wilting of crops resulting in lowered yields - Loss of potential incomes - Increased food insecurity
High atmospheric CO_2 levels	- Increased growth rates of woody plants (primarily C3 photosynthetic pathway) compared to herbaceous plants (grasses, mainly C4 photosynthetic pathway), resulting in a landscape-level wave of bush encroachment and drastically reduced grazing capacity and meat production
Land and soil degradation due to reduced plant cover (and lowered soil organic matter) - Low plant cover due to insufficient growth - Reduced carrying capacity for livestock production	- Higher erosion rate - Dune activation - Lowered crop and pasture production - All these will result in a general condition of desertification and increased vulnerability

Biophysical Description and Sources of Livelihoods in Otjozondjupa and Omaheke regions

The Omaheke and Otjozondjupa regions are located in the east of Namibia and situated on **the Kalahari Desert**. The long-term mean rainfall in the two regions ranges from 250-400 mm per annum (see Figure 1) (Dealie*et al*. 1993). The coefficient of variation of the annual rainfall varies between 30-40% of the long-term mean rainfall (Mendelsohn *et al*. 2002). The general area consists of a large undulating landscape covered with sand dunes traversed by low-lying inter-dunal valleys (Köhler 1959). The sandy soils have low phosphorus and nitrogen contents (Mendelsohn *et al*. 2002), a deficiency that result in poor nutritive value of fodder plants and the nutrient status of foraging livestock. Clinical symptoms of phosphorus and nitrogen deficiency in cattle are common on sandy soils of eastern Namibia especially during the dry season.

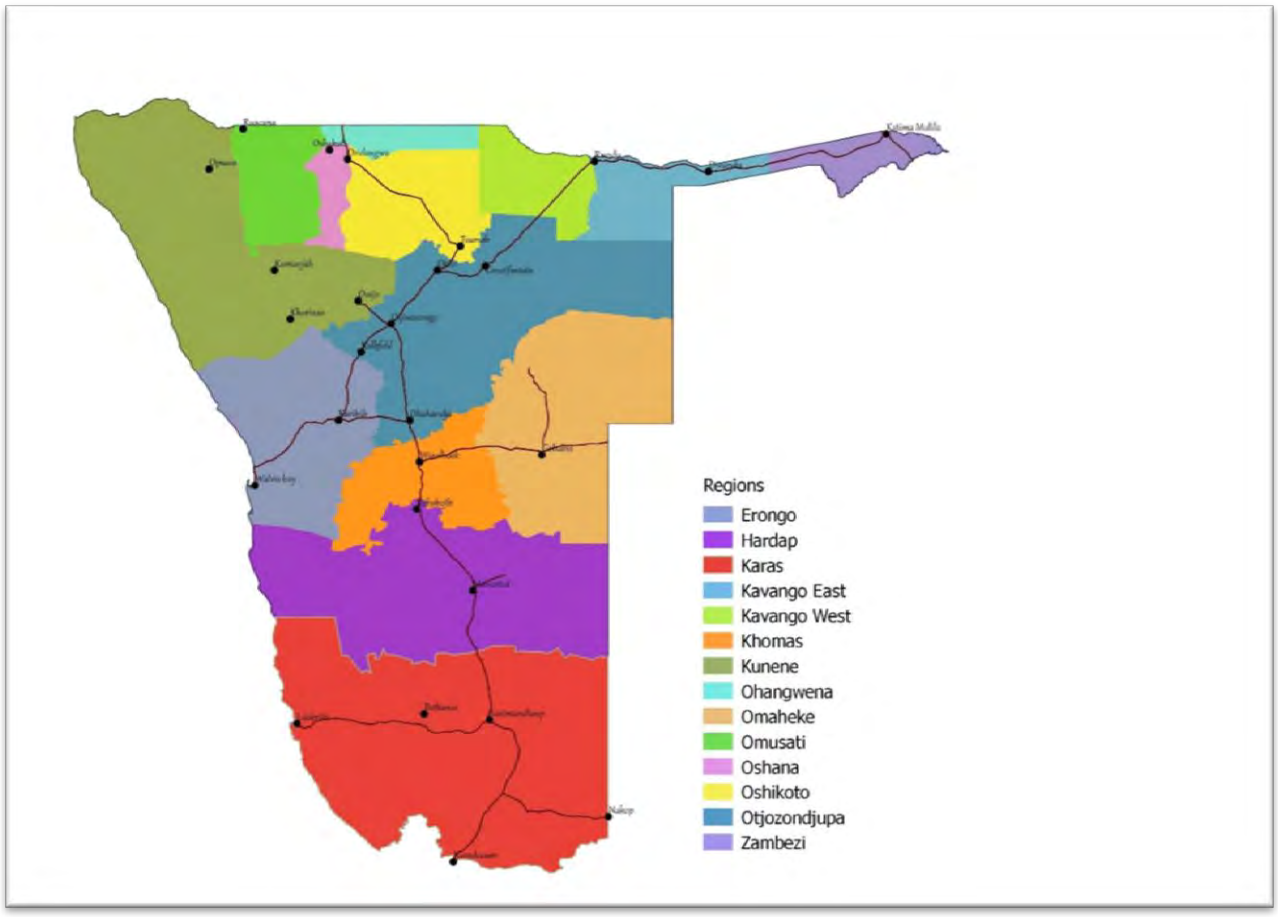

Figure 1: Map of Namibia

Continued livestock grazing and climate change are possibly the key drivers of **bush encroachment** (=bush thickening) in Namibia. Bush encroachment is estimated to cost the agricultural sector no less than N$ 700 mil annually in loss of production (Quan 1994). The Ministry of Agriculture, Water and Forestry views bush encroachment as a serious threat to the national economic development (Mutorwa, 2008).

Thorn bush intensities in Namibia are about 2000 to 10000 bushes per hectare (Zenzi, 2013).Communal areas, which carry most livestock in Namibian, are most severely bush encroached (De Klerk, 2004). Some areas have lost 100% of the land productivity. The carrying capacity of grazing areas in Epukiro, Okakarara, Okondjatu, Otjituuo and Otjiwarongo, has declined significantly from 1 livestock unit (LSU) per 10 ha in the 1960s to 1 LSU per 20 to 30 ha currently. Thus the highest level of bush encroachment is in the Otjozondjupa and Omaheke regions (see Table 2 below). The rest of the country falls within the low to medium levels of bush

encroachment. (De Klerk, 2004). Bush encroachment increases vulnerability to droughts. The recent drought situation (in 2013) has shown how desperate the situation is in communal areas. Many communal farmers have lost more than half of their livestock and many were forced to sell off much of their livestock(Personal observation: S. Hengari, 2014). This has short and long term negative effects on the livelihood of communal farmers.

Table 2: Bush densities in villages in the Omaheke and Otjozondjupa regions

Region	Village	Number of bushes per ha
Otjozondjupa	Okakarara	3,933
	Okamatapati	3,816
	Otjituuo	5,916
	Okondjatu	5,549
Omaheke	Epukiro	8,117
	Otjinene	7,735
	Talismanus	2,883
	Aminius	2,750

Diversification away from livestock grazing can reduce the negative impacts of overgrazing. It can also directly improve the food security of communal farmers.

Water resources: Namibia has limited surface-water sources; more than 50% of water used in Namibia comes from an estimated 50,000 boreholes. The Otjozondjupa and Omaheke regions are overlain with deep Kalahari and rely solely on groundwater resources. Borehole depths vary generally from as low as 120 m to 300 m. With a recharge rate of about 1% percent, Namibia‘s groundwater resources requires judicious deep use, such as drip irrigation for croplands, efficient use of energy sources to abstract groundwater by using solar energy technologies.

This proposed action will specifically build on the existing village Water Point Committees (WPCs). The government has already drilled boreholes for the rural communities and handed management of water and infrastructure to residents of the different villages across the country during the late 1990s. A village community elects it‘s WPC on a regular basis and employs water point Caretaker which it pays on a monthly basis. The WPCs collect livestock fees which mainly become the annual budget for the maintenance of water point infrastructure, lubricants and fuel, travel and subsistence, and the wage of the Water Point Caretaker. The funds are generally kept in a Post Office saving account, for which three committee members of each WPC have signing rights. In most cases the

WPCs have expanded their mandate to controlling access to use of indigenous natural products (such as grazing, timber, water pans and medicinal plants) within the designated periphery boundary of the village. The WPC is the lowest community-level governance structure in villages

Therefore the WPCs of the targeted villages will be the direct operatives of the proposed action, the Community-based Integrated Farming System for Climate Change Adaptation Project. Partly the selection of the targeted villages was based on the existence of strong, well-functioning WPCs which will make the project implementation much easier and institutionally sustainable.

2. PROJECT GOAL AND OBJECTIVES

The project overall goal is to: strengthen the resilience and adaptation of vulnerable communities to climate variability and climate change. The goal will be achieved through community mobilisation and capacity building (Component no. 1), market research (Component no. 2), , strengthening communities‘ capacity to manage rangeland and livestock production (Component no.3), implementation of integrated farming systems (Component 4) and, students involvement and capacity building (Component no 5).

The project objectives are to diversify livelihoods, increase food security and adapt livelihood options to rainfall variability and climate change in Omaheke and Otjozondjupa regions. The proposed action will diversify livelihood options ***in poultry, fruit production and irrigated horticultural production*** with concerted effort to strive for sustainability of production of these three components of the integrated farming system. Different options of value addition for **poultry** and **fruit production will** be investigated. **Capacity building interventions** will be implemented to enhance the *knowledge and skills of farmers to manage* the infrastructure and production.

Table 3: Project components and financing

Project Components	Expected Concrete Outputs	Expected Outcomes	Amount (USD)
Component – 1 & 3: mobilisation & strengthening current farming system	Output 1.1	Outcome 1	55,800.00
Component – 2: Market research & value addition work	Output 2.2	Outcome 2	80 207.00
Component - 4: Production systems and infrastructure design	Output 2.1	Outcome 2	206,382.71
Component - 5 : Students involvement	Output 4.1		283,187.00
Programme Activities Cost (A)			**625,577**
Programme Execution cost (B)			**65,668**
Total Programme Cost (A + B)			**691,245**
Programme Cycle Management Fee charged by the Implementing Entity (C)			**58,756**
Amount of Financing Requested (A + B + C)			**750,001**

Table 4: Project calendar

Milestone	Expected dates
Start of project implementation	Feb – 2016
Mid-term review	November 2017
Project closing	March 2019
Terminal evaluation	June 2019

PART II: PROJECT JUSTIFICATION

A. Project components contribution to overall resilience

A. Describe the project 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 project will promote environmental governance through information sharing of climate change knowledge, and the mobilisation and involvement of communities to adapt to climate change and build resilient food-secure livelihoods, mainly by diversifying food production in an integrated manner through IFS.

The project involves four -stage strategy (Figure 2):

1) The initial focus will be on the establishment and strengthening of community-based organisations to enhance participative and community-driven adaptation planning. Selection criteria for the participating villages and beneficiaries (explained in detail in part III)
2) Conduct market research that will inform the integrated farming systems; adaptation interventions (feasible value addition) and further strengthen the communities traditional farming system through relevant capacity development interventions (through use of students).
3) Involve students through internship programmes to enhance student learning and resilience in climate adaptation and community development; and
4) Knowledge management and awareness raising on climate change and building resilient food-secure livelihoods

This strategy ensures the quality of the combination of production and research, with a strong link to the practical application of community problem solving. The research may include market research, production technique and nutritional assessment and value addition components.

Component 1: Community mobilisation and capacity building, that includes supporting technical services for (a) better understanding of climate risks, impact on livelihoods and food security; and (b) to facilitate participatory decentralised adaptation planning.

Objective 1: Enhance the understanding and capacity of the communities to promote and undertake diversified livelihood adaptation measures

Component 2: Carry out market research for possible value addition and potential customers, and research identified through community adaptation planning that aim to diversify and strengthen the livelihoods of the most vulnerable members of the communities (including gender consideration).

Objective 2: Identify market opportunities; refine, and evaluate marketing actions/plans. This will address issues of design/method need for the specific value addition and provide market opportunity.

Component 3: Capacity building on rangeland and livestock production

Objective 3: Increase the resilience and food security of communities and households through increasing appropriate application of farming system on rangeland management and livestock production, capacity building and research for improved diversified livelihood and sustainable use of natural resources.

Component 4: Design and implement concrete adaptation measures through climate-adapted production systems and infrastructure design.

Objective 4: to design and implement production system and infrastructure that respond climate change induced risks and build long-term resilience to climate change and improve livelihoods of community through diversified source of income and nutrition options; decentralised adaptation planning.

Component 5: Student involvement, capacity building and knowledge management

Objective 5: Contribute to useful practical insight into the project management, application of appropriate technology and conduct research on integrated farming systems; communities‘

participation and project sustainability; and creating ways to transform information to knowledge accumulation.

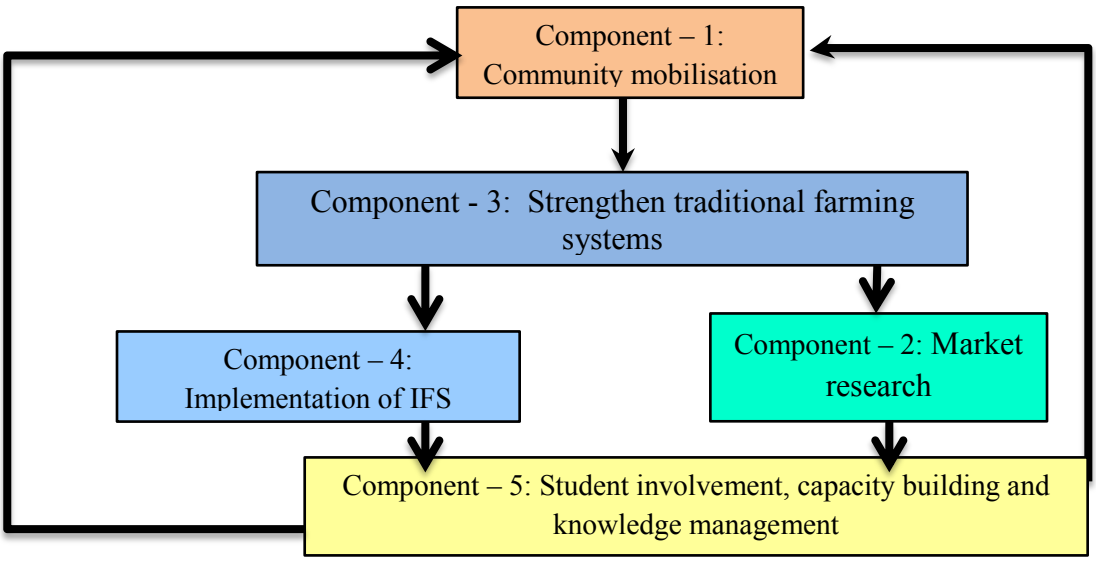

Figure 2: Linkages between the various components (Project design)

Detailed Project Component Description

Component 1: Community mobilisation and capacity building

The efforts will be on strengthening existing local level institutions through mobilisation and participatory project planning/implementation. As a follow up to community consultations carried out:

Outcomes 1.1: Strengthening of community-based organisations to enhance participative and community-driven adaptation planning

Output 1.1: Community mobilisation to promote sustainable livelihood farming systems to adapt to climate variability and climate change.

Activity 1.1: Forum meetings to discuss empowerment and ownership strategies

In the initial 3-4 months, various participatory tools will be used to assess community livelihoods, especially considering livelihood resource ownership, control and access. Workshops will be held

with the communities of the proposed two villages, which will help to map the livelihood systems and related asset base.

Gender Equality Considerations: during the project inception, and subsequent sensitisation and planning workshop, the roles and responsibilities of women and youth will be emphasised. In this regard, the project team will facilitate a process to ensure that female and youth farmers are part of the proposed structures. At community level, clear roles and responsibility schedules are developed emphasising the roles of women to ensure the sustainability of the established structures.

Activity 1.2: Capacity building interventions

Water Point Committee members' empowerment workshops are envisioned with focus on their capacity to plan, organise, and coordinate activities, including mentoring and evaluation processes.

Component 2: Market research

2.1: Market research and value addition for the produce

Outcome 2.1: Market research completed for the produce, combination of production and specific value addition

Output 2.1: Number and type of produce identified for possible value addition and market

Activity 2.1: Conducting market situational analysis

- Identification of market potential for the surplus produce

The following Figure gives the example of supply chain that will be implemented, that summarises the value chain from a _production to consumer' as business model.

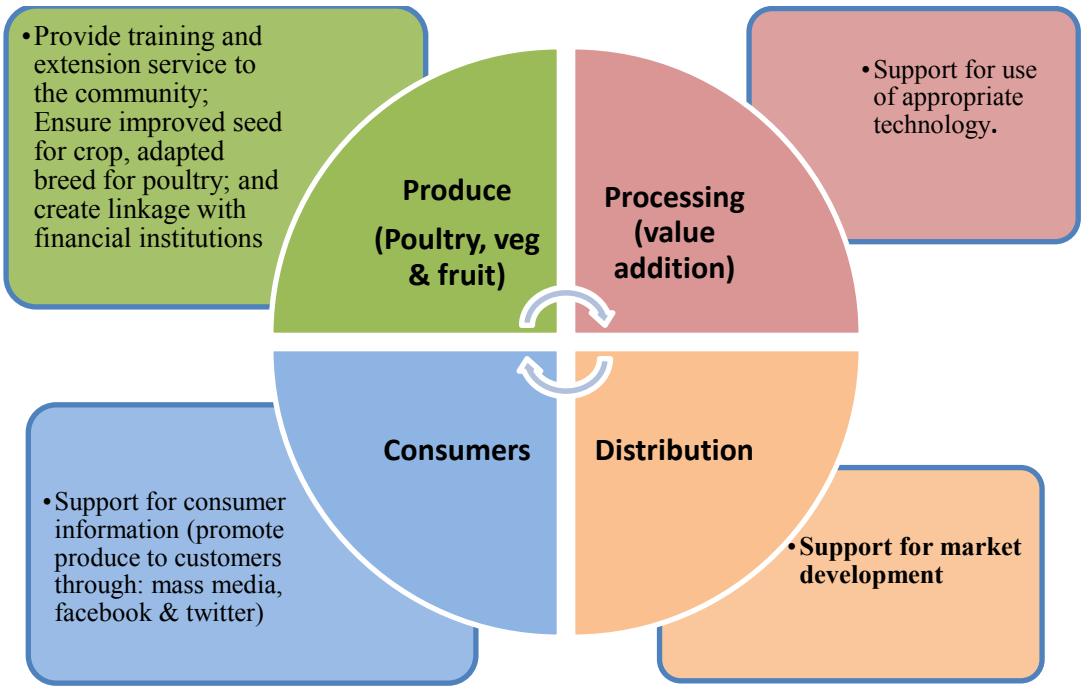

Figure 3: Inter-linkage of supply chain of the project

Conducting situational analysis	•Conduct situational analysis •Create state of current business envorment & opporunity in the area
Research design	•The market research area will be within around the project site around 100km to 150km will be surveyed
Research instrument	•Quantitative and qualitative method; that includes tools (individual questionnarie survey, Focus Group Discussion and key informante)
Sampling & data collection	•Population will be stratified (dividing the population into homegenous matually exclusive groups); and then after reprsentative sample will be determined
Data analysis	•Both quantitative and qualitative method of analysis will be used (that is descriptive analysis and regression analysis)
Comminicate results	•Report will be produced that help to inform, number and type of produce identified for possible value addition and market

Figure 4: Illustration of process of market research

For example Otjozondjupa comprises of seven constituencies with an estimated population of 145000; Otjiwarono being the capital city located at about 100km from the project site. This region has 72 schools with a total of 36,284 pupils and one additional vocational school. In addition to this

there are number of restaurants, catering, super market, government agencies. The region also has 20 primary healthcare facilities including three health centres, 18 clinics and four district hospitals in Grootfontein, Okahandja, Okakarara and Otjiwarongo, police correctional centre and national military defense centre). All this might be potential market place for the project, which are going to be considered for market research.

Whereas Omaheke total estimated population is about 80 000, with 42 schools of total 18,365 pupils and there are two hospitals and one clinic serving the region; being it is the boarder with Botswana also add value for the potential market.

The market research will answer the following critical question:

- What has to be done i.e. the action plans for production and market strategies (product, pricing, distribution, value addition and promotion decisions)
- Who is responsible for carrying out the actions (that define also the responsibilities of project members or other marketing agencies in the area)
- When should the action be carried out (that provide the time framework aligned with production)
- What objectives will be achieved by which actions (that includes consumption, production and marketing decision)

In addition to this the market research will able also to guide (i) organising & planning marketing process; and (ii) reviewing the business situation regularly

Component 3: Strengthen traditional farming systems

Outcome 3.1: Improved knowledge and skills of communities to increase resilience to climate change threats on the existing farming system; and implementation of livelihood options for climate change and adaptation.

Output 3.1: Number of community members trained on climate change threats and adaptation measures (that includes women and youth).

Output 3.2: Number of WPC members trained on managing water resource, climate change issues and managerial skill

Activity 3.1: Production of module on rangeland management and livestock production; and workshop training on the module.

Activities in this sub component will be: (i) Pasture composition; (ii) rangeland use/rotational grazing; use of ephemeral surface water; (iii) biomass production estimate carrying capacity; and (iv) animal husbandry and animal health

Activity 3.2: Strengthen community organisation, knowledge and skills

- Strengthen community organisation and governance structures (e.g. water point committee)
- Provide knowledge and skills in the following areas:
    - Husbandry of poultry and crops
    - Theoretical foundation of IFS
    - Operation and maintenance plant and equipment
    - Action research involving local students
    - Market knowledge, up-to-date market information, marketing channels and processing

Activity 3.3: Bush encroachment reduction mechanism

The figure below illustrates charcoal making machine designed by Polytechnic which is already used in some of the rural communities for charcoal production; this will be for this project to harvest **encroaching bushes .**

Figure 5: Charcoal making machine

Component 4: Implementation of IFS

This component promotes integrated farming by combining ***crop, poultry and fruit production,***.i.e a permaculture system (inter-linked sustainable environment and livelihood system).

Inception workshops will be held with communities to clarify the benefit of the Integrated Farming System as source of income and ways to diversify livelihood; and also advantage of nutritional value from the vegetables and fruits. Following these inception workshops, implementation will be rolled-out.

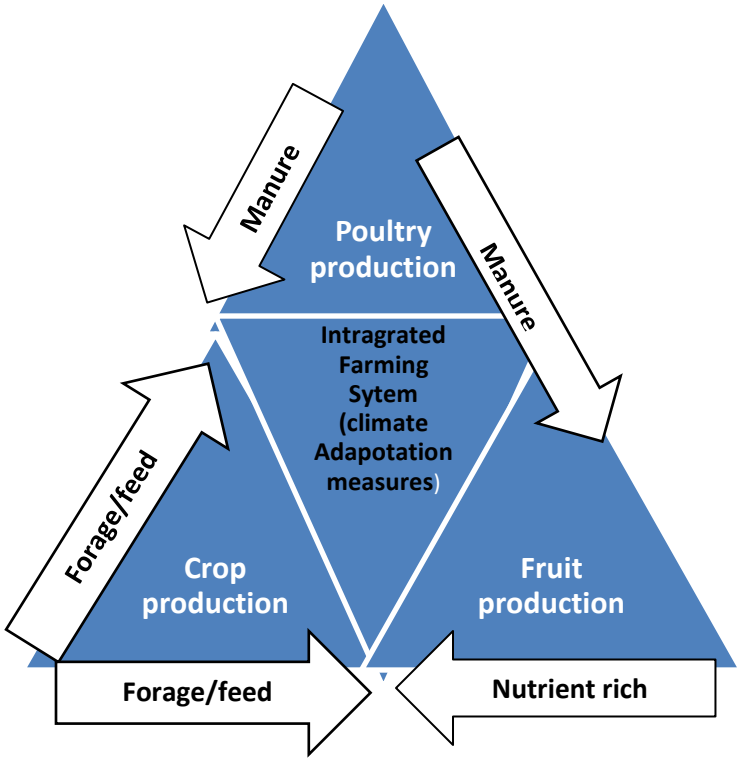

Figure 6: Integrated farming system

Specific challenges to be addressed through this project:

i. Promote awareness of sustainable livelihood diversification and integrated farming systems to adapt to climate variability and climate change;
ii. Foster and promote capacity development in integrated farming systems at the local level;
iii. Diversify livelihood options by creating an integrated farming system comprising of fruit production (initially starting with citrus fruit based on its current availability and practise in these regions), poultry and irrigated horticultural production
iv. Strengthen the governance of community Water Point Committees; and
v. Disseminate lessons learned from this project to promote up-scaling of similar climate change adaption projects to other communities or regions of Namibia.

4.1: Preparation and construction of semi-intensive poultry production system

The Integrated Farming System (IFS) will be comprised of three key production components, these are: irrigated horticulture, poultry and fruit production (citrus fruit would be an initial consideration based on current practices amongst the community members). The production system will consider

summer and winter crop varieties. The layout of the production system will be integrated to enhance synergies between the production components (see Figure below) for efficient application of organic fertiliser and water.

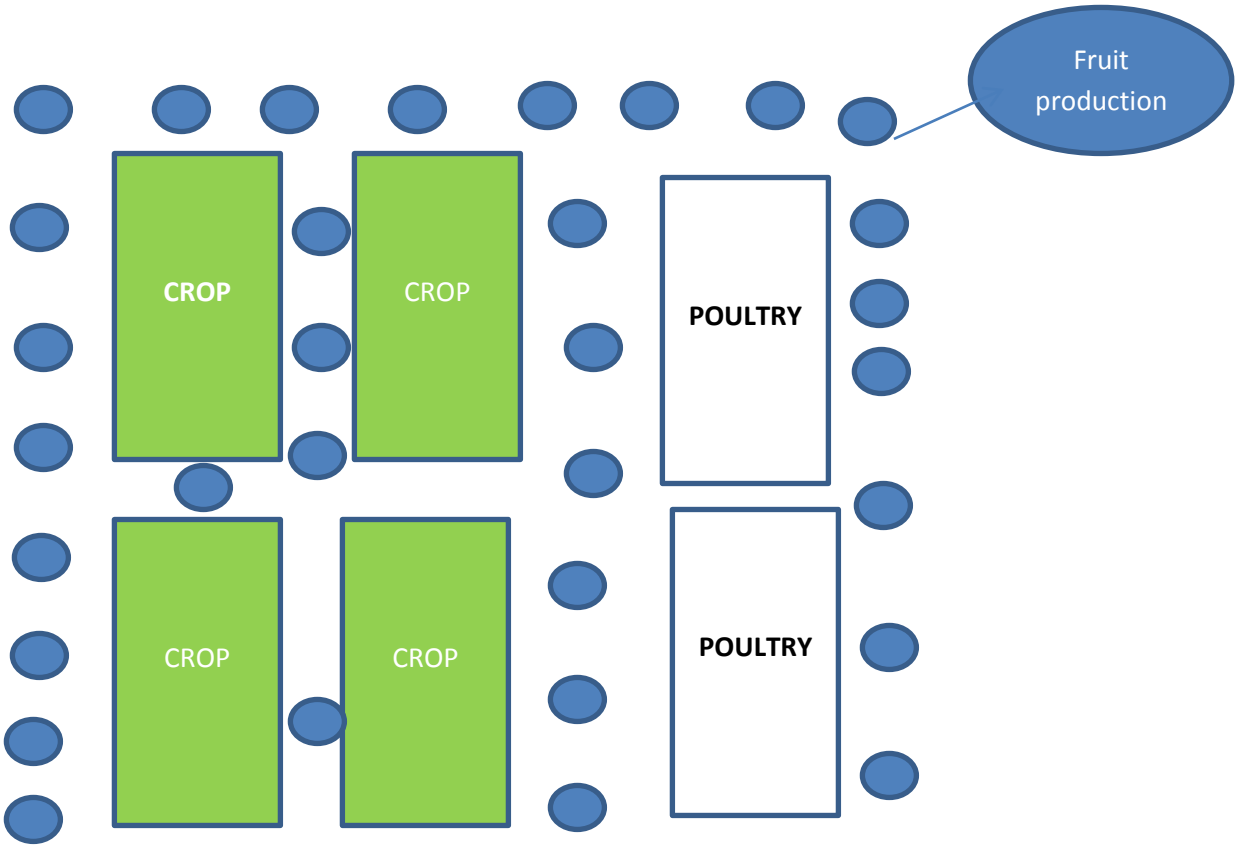

Figure 7: Proposed production design

Outcome 4.1: Improved income and nutrition from poultry production

Table below illustrate the economic benefit of poultry should all the produce be sold, without value addition.

Table 5: Summary of partial enterprise budget for Poultry

	Units	**Qty**	**Price**	**Total-USD**
Total Revenue	Chicken	150	2.14	321
Egg	Egg	30000	0.1	3,000
Total Revenue				**3,321**
Production cost				
Starter feed	bags (50kg)	4	28.57	114.28
Finisher feed	bags (50kg)	4	32.14	128.56
Stock EM	Litre	4	21.43	85.72
Molassess	Litre	4	21.43	85.72
Brewers grain	bags (50kg)	12	18.57	222.84
Medications &vaccine				150
Total production cost				787.12
Gross margin (per cycle)				**3,148.48**

Output 4.1.1: planning and construction of poultry infrastructure completed

Planning, design of the construction completed in phase-1; with 200 hens with production cycles of 3-4 months market ready (4.5 – 5 kg if well fed), 3 to 4 cycles a year under semi-intensive production. First year chickens will lay over 150 eggs.

Activity 4.1.1: Acquisition of production inputs and infrastructure

- **Production Asset:** Chicken of three-four weeks will be purchased/sourced from the Mashare Agricultural Development Institute in Kavango Region or South Africa.
- **Building of chicken run and chicken houses:** ALBET shadenet 30%, galvanise steel wire 2.2mm, kaufmann net wire, metal poles, galvanised corrugated roof sheets.
- **Labour input:** skilled labour on building poultry infrastructure and unskilled labour will be sourced from the community

Output 4.1.1: Number of hens and eggs produced contributing to nutrition and income

Activity 4.1.2: Poultry Husbandry

The broiler production systems will be implemented, starting with 300 chicks for the first 6 months of the first year. This will allow for sufficient training in poultry enterprise. When operational and marketing logistics are established, production will be doubled. It is envisaged that a full scale production will be achieved by the second year. The market will mainly consist of the local communities, street vendors, lodges and restaurants in Okakarara, Okondjatu, Otjinene and Epukiro settlements in both the Otjozondjupa and Omaheke regions.

Feeding: will be done through starter commercial feed, finisher feed, stock EM, molasses and brewers grain. As the vegetables and crops are produced from the irrigated horticultural production component, feed will increasingly be obtained from that component; hence scaling down on externally sourced feeds.

There are several factors that will be considered in the poultry section, these are:

- The egg production of chicken declines with age. First year chickens will lay over 150 eggs each (which means roughly 200*150 = 30000 eggs) in a year with this dropping to 150 eggs in the second year and further as they continue to age. Chickens can live till seven years old and will often keep producing eggs until their end. However, at fourth year chicken will be sold for meat; every two years new stock will be filled.

Other related activities:

- Regular disinfection of chicken houses
- Training of workers at local agriculture and livestock training centres
- Production cycles 3-4 months market ready (4.5 – 5 kg if well fed), 3 to 4 cycles a year under intensive production

The poultry production will be closely located and interlinked to the crop and fruit tree production components to provide organic fertiliser (manure) inputs.

4.2: Preparation of construction for horticulture and fruit production

Outcome 4.2: Improved income and nutritional value

Output 4.2.1: Planning and construction of crop and fruit production completed

The table below shows the financial benefit of the irrigated horticultural production, assuming all produce will be sold.

Table 6: summary of a partial enterprise budget for irrigated horticultural production

Crop	Units (Yield per ha)	Yields (per ha /Ton)	Price of crop per ton (USD)
Potatoes	Ton	30	20.00
Onions	Ton	40	20.00
Butternuts	Ton	20	25.00
Pumpkin	Ton	20	28.00
Watermelon	Ton	4000	1.00
Sweet potatoes	Ton	40	25.00
Tomatoes	No of plant	3000	1.00
Maize	ton	8	27.00
Gross Revenue			**10,676.00**
Production Costs per ha			
Potatoes		688	
Onions		473	
Butternuts		321	
Pumpkin		260	
Watermelon		460	
Sweet potatoes		274	
Tomatoes		154	
maize		115	
Total production cost			**2,745**
Gross Margin			**7,931**

Activity 4.2.1: Laboratory soil tests

In determining the irrigated horticultural production suitability for the area, laboratory soil tests will be done. This will help to decide on the type of crops and weather condition of the area. Furthermore, the irrigated horticultural production rotational practice for the soil type will be investigated to determine crop management practices such as, planting data, soil depth, fertiliser and irrigation programme and also harvesting date. The physical and chemical properties of the dominant soils information will determine the type and combination of crops in the area.

Output 4.2.1: Quantity of vegetables and fruit produced

Activity 4.2.2: Fruit production

- Infrastructure will be developed over the first year and then production will commence
- Crop selection will be based on the suitability of the soil, climate and market potential
- The project will combine summer and winter fruit crop

The vegetable garden: this shall be planted with spinach, onions, carrots, cabbages, maize, potatoes, onions, butternuts, pumpkin, watermelon, sweet potatoes and tomatoes.

Activity 4.2.3: Irrigation infrastructure installation

- Drip irrigation drip line 500m per ha
- SaddlisPum (4KV =2liter per hour) required quantity 250
- Filter Fittings

Activity 4.2.4: Acquiring implements

- Axes and handles, cutting machines, picks & handles, spades, rakes and generator
- One 4x4 pickup vehicle and tractor also requirement for the success of the irrigation
- Buying seeds, organic and pest control remedies
- Establishing nurseries to raise seedlings

***Activity 4.2.5 Fruit production*:** drip irrigation for minimal use of water resources.

Component 5: Student involvement, capacity building and knowledge management

The component proposes to take up actions to generate awareness amongst the community about different climate change related issues and associated risks.

Outcomes 5.1: Improved preparedness to adapt to adverse climate variability and climate change impact.

Output5.1: Community mobilisation to promote awareness of sustainable livelihood diversification and integrated farming systems to adapt to climate variability and climate change.

Activity 5.1: Awareness generation workshops

In the initial 3-4 months, awareness generation workshops will be held with the communities of the proposed two villages, which will help the communities to understand the climate related risks and

hazards as well as the techniques available for minimising the risks involved. These introductory workshops will involve vulnerable community member that includes youth and women.

This component has a strong capacity building element through knowledge management and information sharing. By virtue of the project application being a Higher Education Institute a strong focus will be on involvement of students through: (i) internships and (ii) research project (from both undergraduate and postgraduate students).

Information packages (e.g. maximising yield per hectare). Seeing information and knowledge as components of adaptive capacity would encourage actors to put more emphasis on giving community with a wider range of information, appropriate to circumstances and future scenarios; giving community the tools to useful information for them; and **turning information into knowledge** by supporting communities‘ ability to use the information for decision-making.

Students will be attached for six months to the project as interns as part of the work integrated learning curriculum of the Polytechnic of Namibia. The benefit of the internship with community for six months would be:

i. work experience and transferable skills: skills that fit within Namibian socio-economic situation and cultural setup; specifically students who will attached with community should be candidate that understand the culture, and custom of society so that good trust and relationship to be created, eventually lead to better understanding and learning process among each other
ii. Student will earn course credit: earning credit through practical teaching experience student become more competitive and capable to solve climate related problem
iii. Gain practical experience, by applying methods and theories learned in classes: Many people learn best by being hands on. But everyone can benefit from practical exposure of what they have been learning in class, put to action; whether it‘s in agricultural research lab and marketing development meeting.

Additional advantage of this type of linkage will: (1) (professional ideological education) it makes clear the specialty orientation; (2) (specialty understanding and practice) it strengthens and stabilize students‘ thoughts about their specialty; (3) (curriculum experiment) it helps students master the methods and means of doing basic experiments and trains their action ability and basic skills; (4)

(course practice), through combination of theory and practice it consolidates students‘ mastery of theories; (5) (curriculum design) it promotes the cultivation and training of the ability to solve social practical problems with the application of specialized theories; and (6) (training at practice base) it helps students participate in special training platform which combines real agricultural production, study and research, further trains students‘ comprehensive ability to analyse and solve problem and cultivates their ability to be a team player.

Activity 5.2: registered students identification and attached to the project for six months

5. 2: Students research projects

In this component two levels of student researchers will involve that is undergraduate as part of the internship for short period type research (six month) the second group will involve postgraduate students, which they involve minimum two year and maximum three years project involvement. Research topics includes (i) marketing related topics, (ii) production related topics and (iii) nutrition related topics

Outcome 5.2: Improved knowledge and skills of students around resilience to climate change threats on the existing farming system; and research produced related to IFS and climate change and adaptation.

Output 5.2: Number of students trained on climate change threats and adaptation measures (that includes female and male students).

Output 5.2: Number of students completing their research project work.

Activity 5.3: registered students identification, proposal preparation, data collection and analysis

Table 7: Demonstration of adaptation relevance in to address National adaptation objectives

Project Components	**Relevance in addressing adaptation objectives or National Climate Change Strategy/Action Plan**
1: Community mobilisation and capacity building	With cross-cutting issues for climate change adaptation and mitigation (A3), thematic area Capacity building, training, and institutional strengthening (T1) ***Strategic Aim-1 (SA-1):*** Strengthen human resource capacity building for climate change With **objective 1** of this project will enhance the understanding and capacity of the communities to promote and undertake diversified livelihood adaptation measures Training subjects will strengthen outreach and participatory work with communities; will include general aspects of project and natural resource management and inclusion of community adaptation plans into regional planning.
2. Market research	Under With strategy Adaptation (A1) thematic 1 (T1): Food Security and Sustainable Resource Base indicated that ***SA4***. Specifically activity four (A4) indicated that provide good marketing opportunities for small-scale farmers. Therefore, **Objective 3** of this project will identify market opportunities; generate, refine, and evaluate marketing actions/plans. This will address issues of design/method need for the specific value addition and market opportunity for the produce
3. Strengthen traditional farming systems	With strategy Adaptation (A1) thematic 1 (T1): Food Security and Sustainable Resource Base indicated that ***SA4***: Development of climate resilient livestock breeds. Therefore, using **objective 3:** Identify market opportunities; generate, refine, and evaluate marketing actions/plans. This will address issues of design/method need for the specific value addition and identify market opportunity
4. Implementation of IFS	With cross-cutting issues for climate change adaptation and mitigation (A3), thematic area Technology Development and Transfer (T7); ***SA-2:*** Strengthen human resource capacity building for climate change **Objective 4:** Increase the resilience and food security of communities and households through increasing appropriate application of farming system on rangeland management and livestock production, capacity building and research for improved diversified livelihood and sustainable use of natural resources
5. Student involvement, capacity building and knowledge	With cross-cutting issues for climate change adaptation and mitigation (A3), thematic area Capacity building,

management	training, and institutional strengthening (T1) 1. ***SA1***: Strengthen human resource capacity building for climate change 2. ***SA5***: Develop and implement educational program on climate change and its impacts. Under **objective 5**: Contribute to useful practical insight into the project management, application of appropriate technology and conduct research on integrated farming systems; communities' participation and project sustainability; and ways to create information to transform to knowledge

Table 8: Role and responsibility of executing entity

Project Component & Activities	**Responsible institution**
Component 1: Community mobilisation and capacity building	
• Forum meetings to discuss empowerment and ownership strategies	Polytechnic of Namibia
• Capacity building interventions	Polytechnic of Namibia
Component 2: Market research	
• Conducting market situational analysis	Polytechnic of Namibia
Component 3: Strengthen Traditional farming system	
• Production of module on rangeland management and livestock production	Polytechnic of Namibia & Agriconsult Namibia
• Workshops & training on the module	Polytechnic of Namibia & Agriconsult Namibia
• Strengthen community organisation, knowledge and skills	Polytechnic of Namibia & Agriconsult Namibia
• Bush encroachment reduction mechanism	Polytechnic of Namibia & Agriconsult Namibia
Component 4: Implementation of IFS	
• Acquisition of production inputs and infrastructure for poultry husbandry	Contractor
• Laboratory soil tests for small scale garden	Contractor
• Acquisition of production inputs and infrastructure for garden	Contractor
• Irrigation infrastructure installation	Contractor
• Capacity building workshop	University of Free state, Polytechnic of Namibia & Agriconsult Namibia
Component 5: Student involvement, capacity building & knowledge management	
• Registered students identification and attached to the project	University of Free state, & Polytechnic of Namibia
• Proposal preparation, data collection and analysis	University of Free state, & Polytechnic of Namibia

B. Economic, social and environmental benefits of the project

B. Describe how the project 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 will avoid or mitigate negative impacts, in compliance with the Environmental and Social Policy of the Adaptation Fund (the Environmental and Social Policy).

Social benefit

- Improved social wellbeing, through poverty reduction and food security.
- Increased solidarity and mutual help through community group structures
- Improved capacity of the community to implement IFS
- Local governance structures (e.g. WPC) will be strengthened and their capacity to govern increased
- Improved community rangeland resources management; thus better adaptation to rainfall variability.

Role of women and vulnerable communities

- From revised WPC women and vulnerable communities will contribute to project administration and decision process management
- Women and vulnerable communities will contribute their labour during project land preparation and implementation on the operational function of the project during production, harvest and marketing
- Indirectly also to participate on the service and innovation (example supplying inputs)

Benefit to women and vulnerable communities

- Rural women are constrained by unequal access to productive resources and services and inadequate or inaccessible infrastructure. The limitations rural women face in turn impose huge social, economic, and environmental costs on society as a whole and rural development in particular in Namibia, as a result agricultural productivity lags behind. Thus from this project women and vulnerable communities will benefit from higher access and

participation; as the main target of this project will be to women and vulnerable communities.

- Economic empowerment is important as a means of guaranteeing families‘ secure livelihoods and overall well-being. Women and vulnerable communities‘ economic empowerment can have a positive impact and interconnected with, their social and political empowerment, through their increased respect, status, and self-confidence and increased decision-making power in households, communities, and institutions. While there is a strong ~~–b~~usiness case” for addressing women and vulnerable communities‘ economic empowerment
- This project will enable women and vulnerable communities‘ greater access to productive resources, and enable greater integration.
- Women are crucial in translating agricultural production into food and nutrition security, and the well-being of, their families, their communities which improve capabilities of the society
-

Health benefit

- Improved nutrition from consumption of vegetables, fruits and poultry products
- Reduce occurrences of diseases associated with the high consumption of red meat and dairy products

Environmental benefits

- Water-use efficiency: micro-drip irrigations will save water.
- Energy efficiency: the project will make use of solar energy for lighting, water pumping, and heat generation for the chicken house.
- Soil fertility management: soil nutrients will be managed to suit crop requirements following analysis of soil chemical and physical properties; focus will be on the use of organic matters.
- Minimum land clearance; retention of big indigenous trees (and protected plant species).
- Reduce pressure on grazing: as the community would diversify their livelihood source; and the application of suitable rangeland management practices

- Value addition and associated efficiency gains enable people to make more from less, so more income is derived from fewer resources used up. Value addition can reduce environmental impact.

Economic benefit

- Diversfied income
- Value addition to chicken, vegetable and fruit production (exact type of processing will be determined by market research)
- Self eemployment opportunities

Table 9: summary of economic benefit

Enterprise	annual estimated income (USD) in first two years	after three years	Reference
Poultry	3,148.48	3,148.48	see Table 5
horticultural production	7,931.00	7,932.00	see Table 6
Fruit production		20,000.00	50kg per tree @ $2 per kg of 400 trees After three year (FAO source)
Total estimated economic benefit	**11,079.48**	**31,080.48**	

C. Analysis of cost effectiveness

C. Describe or provide an analysis of the cost-effectiveness of the proposed project.

The project will utilise a community approach that includes a concentrated effort on community mobilisation, awareness raising and training. This approach will involve local people in: managing natural resources, social needs and sustaining outcomes over time (maintaining local cultures, increasing opportunities for income generation, and improving food security and well-being).

Table 10: Summary of cost effectiveness Proposed action and approach

Proposed action and approach	**Potential alternative action**	**Reason for the proposed action**
Poultry	Piggery	- Piggery: not locally widely consumed; - Input costs is high (feed cost is too high). - Feed availability largely to be externally sourced
		- Poultry is reared at low scale; - highly consumed locally; and - feed will be produced from the IFS
Vegetable garden and citrus fruit	Purchase from retail outside the communities	- Transport costs; - price fluctuations; - not easily accessible, - available and affordable
		- Thus local product and skill development in the production system; will minimise vulnerability to food security caused by climate change
IFS approach	Isolated production interventions	- Enhance efficient use of resources, - recycle nutrients, use waste from one enterprise as an input in next enterprise
Participatory approach		- Enhance involvement of women and youth - IFS use as skills training for students

D. Consistence of the project with national or sub-national sustainable development strategies

D. Describe how the project 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.

As indicate on the Ministry of Environment and Tourism (2009) –Climate Change Strategy and Action Plan" Indicated that Namibia climate change strategy is divided into three aspects namely ***Adaptation, Mitigation and Cross-cutting issues for adaptation and mitigation***. Adaptation is to address through three thematic areas: (i) food security and sustainable resource base, (ii) sustainable water resources, human health and (iii) well-being and infrastructure, while sustainable energy and low-carbon development and transport will address the aspect of mitigation. Cross-cutting issues will be addressed by the following themes: capacity building, training and institutional strengthening, research and information needs, public awareness, participation and access to information, disaster reduction and risk management, financial, resource mobilisation and management, international cooperation, networking and technology development; and transfer and legislative development.

Adaptation

i. Food security and sustainable resource base

In particular, the poor and vulnerable, especially women and children will be severely affected. Therefore, under the theme of food security and sustainable resource base, the following strategic aims shall be undertaken:-

Agriculture

- Development of climate resilient cropping/ agriculture / production systems
- Development of climate resilient crop varieties / cultivars
- Diversification of agriculture and livelihoods
- Development of climate resilient livestock breeds
- Adaptation against drought

Forestry

- Conservation, utilisation and sustainable development of forest resources

Fisheries and aquaculture

- Conservation, utilisation and sustainable development of fisheries and aquaculture (incl. marine and freshwater aquaculture)

Coastal zone

- Conservation, utilisation and sustainable development of the coastal zone and its resources

Biodiversity and ecosystems

- Conservation, utilisation and development of biological resources and maintenance of ecosystems to ensure environmental sustainability

ii. Sustainable water resources

The Climate change strategy will therefore undertake the following with regards to water resources:-

- Conserve and manage watershed / catchment areas
- Promote integrated development and management of water resources
- Promote conservation and sustainable utilisation of water resources
- Improve trans-boundary cooperation regarding water resources
- Support institutional and human capacity building in water resources management and use

iii. Human health and wellbeing

Poor sanitary conditions due to predicted floods in some areas as well as malnutrition due to reduced crop yields and reduced livestock productivity will increase child mortality. Therefore, the strategy will therefore address the following:-

- Adaptation to climate change related health risks
- Assessment of impacts of climate change on human health and well being
- Expansion of health facilities and network to remote areas

- Improve capture, management, storage and dissemination of health information
- Improve access to sanitation and water
- Increase human resources capacity and improve efficiency
- Support action plans against HIV/AIDS

Cross cutting issue for adaptation and mitigation

i. Strengthening institutional capacity

Building human and institutional capacity to address climate change must be a fundamental component of the Namibia climate change strategy; state that lack of competent technical experts poses a serious capacity bottleneck in specialized fields and climate change is such one field. Hence the strategy will:-

- Strengthen human resource capacity building for climate change
- Main-stream climate change in national, local and sector policies, development plans & program
- Strengthen institutional capacity for climate change management
- Mainstream climate change in the media
- Develop and implement educational program on climate change and its impacts
- Promote and facilitate development of educational materials on climate change
- Facilitate and support training of scientific, technical and managerial personnel in climate change
- Develop disaster risk reduction capacity building plans and programmes for climate change.
- Establish Climate Change Resource Centre and Climate Change database

ii. Research and information needs

There is need to undertake research especially in order to quantify the likely impacts and development of practical solutions for adaptation and mitigation.

- Collect data and model climate change an national, regional & local levels
- Monitor ecosystem and biodiversity changes and their impacts
- Conduct climate-proof research
- Undertake research on sea level rise
- Establish a centre for research and training on climate change
- Conduct inventories on traditional / indigenous knowledge and coping practices
- Undertake studies on the cost of adaptation and mitigation
- Study macroeconomic and sectoral impacts of climate change

iii. Public awareness, participation and access to information

knowledge-based economy and technology driven nation' was included in NDP4. In order to effectively address adaptation and mitigation, the public needs to be aware and have access to accurate, up-to-date information in order for them to effectively participate in climate change issues. The strategy therefore will undertake the following:-

- Awareness raising and public education on climate change
- Promote and facilitate development of public awareness materials on climate change
- Facilitate access of climate change information to the public
- Promote public participation in addressing climate change and development of adequate responses

The Government acknowledge that there is a need through the project, to break down existing barriers to adaptation, including: 1) lack of information at all levels knowledge and proper management of climate risks, 2) weak local and national capacities to develop climate change strategies and adaptation measures and knowledge management and its dissemination and replication, 3) poverty and the lack of resources to invest in soil and water preserving assets at the community and household levels to improve livelihood of the community, 4) lack of alternatives to short-term, unsustainable coping strategies, and, 5) institutional fragmentation which results in the lack of a coherent strategy and projects that are complementary

Considering the above outlined discussion with regards to ***"Namibian Climate Change Strategy and Action Plan"*** and with the challenges mentioned. Thus this shows clearly the proposed project components and activities are consistent with the government national and sectoral strategies related to climate change for ***Adaptation, Mitigation and Cross-cutting issues for adaptation and mitigation***. That includes Component no. 1 (community mobilisation and capacity building), Component 2 ((market research, Component no. 3 (strengthening communities' capacity to manage rangeland and livestock production) Component no. 4 (IFS) and Component no 5 (students involvement and capacity building) contribute directly to the ***"Namibian Climate Change Strategy and Action Plan;*** as presents below self-explanatory graphic demonstration (Figure XXXUY).

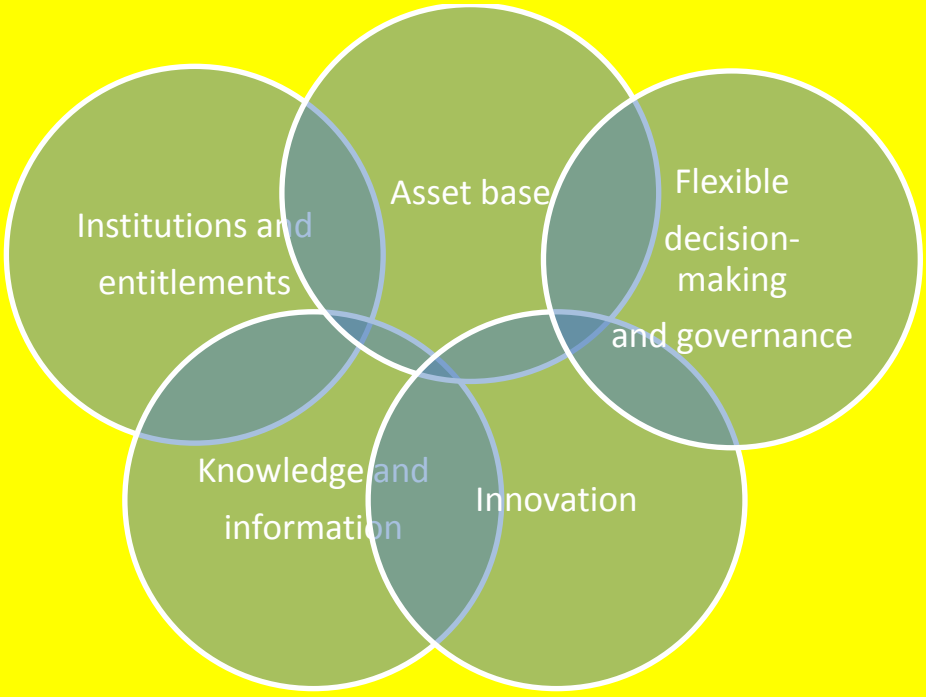

Figure 8: Graphical demonstration adaptation reasoning

Table 11: Illustration of adaptation reasoning

Characteristic	Feature that reflect a high adaptive capacity
Asset base	IFS increase availability of key assets that allow vulnerable communities respond to the circumstances
Institutions and entitlements	Strengthen WPC allows fair access and entitlement to asset & capitals
Knowledge and information	Ability to collect, analyses and disseminate knowledge and information support adaptive capacity
Innovation	IFS creates an enabling environment to foster innovation, experimentation and ability to explore niche solutions in order to take advantage of new opportunities
Flexible forward-looking decision making & governance	IFS enable to anticipate, incorporate and respond to changes with regard to its governance structures and future planning

Adaptation in the project expected to go beyond business as usual, beginning with rooting the ownership of interventions in the communities, linking community actions through support from technical agencies in the field, ensuring that there are institutions at national level that are creating a supportive policy and regulatory environment, and ensuring that the broader national strategy for climate change adaptation is informed by lessons that are emerging from the ground.

E. Relevant national technical standards compliance

E. Describe how the project meets relevant national technical standards, where applicable.

The Project activities will be carried out in compliance with national standards. The proposed interventions will adhere to national technical standards that are in force, particularly related to the IFS operation and value addition. Through its training activities aimed at technical services the project will promote the knowledge and understanding of such standards. The following legal and policy framework will be complied with:

- ***Environmental Management Act no 7 of 2007:*** the scale of the project and associated impacts are small scale in nature would not have significant impacts on people and the environment. There would no land clearing as production systems will be integrated in the existing land scape of the project sites.

- ***Water resource Management Act no 2004:*** The project would not require the drilling new boreholes for the abstraction of ground water. Existing high yield boreholes will be utilised. The volumes of water to be used will be minimal as efficient water use technology will be employed. Therefore, environmental impact will not be required.

- ***Soil Conservation Act 76 of 1969:*** Soil pollution will be minimised as organic fertilisers (chicken manure) will be applied. The layout of the production system create the conducive micro climate for crop growth through the use of natural and fruit trees as wind breaks and thereby prevent wind erosion. This is aligned with the requirement of the Act.

- ***Agricultural Pesticide Act 3 of 1973:*** Approved pesticide will be used in line with the requirement of the Namibian Agronomic Board.

- ***Forest Act 12 of 2001:*** The project will not cut down tree and will indeed conserve protected tree such as *Acacia erioloba* and *Bosciaalbitrunca* that occur in the project area.

- ***Communal Land Reform Act 2002:*** the selection of project sites where done in consultation with local communities and traditional authorities. The latter are the custodians of the communal land and have jurisdiction over the use and allocation of land.

- ***The Health Act, 1977 (Act 63 of 1977):*** regulations promulgated under the Act govern, among others, the hygiene aspects of food premises and the transport of produce. Training and skills development intervention will ensure occupational health and safety standards of the workplace (project site).

F. Description of duplication with other funding

F. Describe if there is duplication of project with other funding sources, if any.

The Ministry of Agriculture, Water and Forestry, Directorate of Extension and Engineering Services launched a project entitled –Integrated Initiative in Support of Urban and Peri-Urban Horticulture Development" in Namibia Funded by the Ministry of Agriculture Water & Forestry, the project technical specifications includes:

1. Integrated production and protection management techniques
2. Micro-garden system
3. Micro-irrigation techniques
4. Cultivation of improved and adapted varieties

With ultimate goal of the project contribution to food security by improving access to high quality fresh horticulture produce at household level all year round; and also promote employment and income for the less endowed population in the Urban and Peri-Urban environment. In addition to this project is aiming at :

1. Efficient water usage less insects and disease
2. Require little physical effort, weak/old and young can do it
3. Require limited space

Another initiative of government under the MAWF is to encourage the development of irrigation based agronomic production in Namibia (known as Green Scheme) with the aim of increasing the contribution of agriculture to the country's Gross Domestic Product and to simultaneously achieve the social development and upliftment of communities located within suitable irrigation areas, but to also promote the human resources and skills development within the irrigation sub-sector to possibly enhance cross-border investment and facilitate the exchange of relevant and limited resources with neighbouring countries. That is commercially viable environment through effective public-private partnership, stimulate private investment in the irrigation sub-sector and settle small-scale commercial irrigation farmers.

Another bigger and multi-sectorial five year project (2008-2012) initiative known as Country Pilot Partnership for Integrated Sustainable Land Management (CPP-ISLM) is worked towards

combating land degradation by using integrated cross-sectoral approaches, which would enable Namibia to ensure environmental sustainability as well as the protection of dry land ecosystems and their functions.

The CPP-ISLM is a partnership programme between eight Ministries, namely the Ministry of Environment and Tourism; Ministry of Agriculture, Water and Forestry; Ministry of Lands and Resettlement; Ministry of Regional And Local Government And Housing and Rural Development; Ministry of Mines and Energy; Ministry of Finance, Ministry of Fisheries and Marine Resources; and the National Planning Commission. The implementing partners include, the Global Environment Facility (GEF), United Nations Development Programme, the European Union (EU), German Technical Cooperation (GIZ), Non- Governmental Organisation communities such as the Namibia Nature Foundation (NNF), are all aimed at overcoming barriers to combating Land degradation and its effects.

The Innovative Grants Mechanism (IGM) component, is a small-scale investment that finance tangible produce and practical results from the use of natural resources and its products, and/or those that contribute to improved land management. The grant facility supports community-based projects which target the following:

- Income generating activities linked to sustainable land management that improves livelihoods through job creation.
- Food security and capacity building in ISLM.
- Activities that promote public-private partnerships in ISLM for sustainable livelihoods and activities that preserve and restore biodiversity in areas under greatest land-use pressure
- Actions improving market access and performance of natural resources and products from improved land management
- Activities that mainstream biodiversity priorities into land use planning and policy-making.

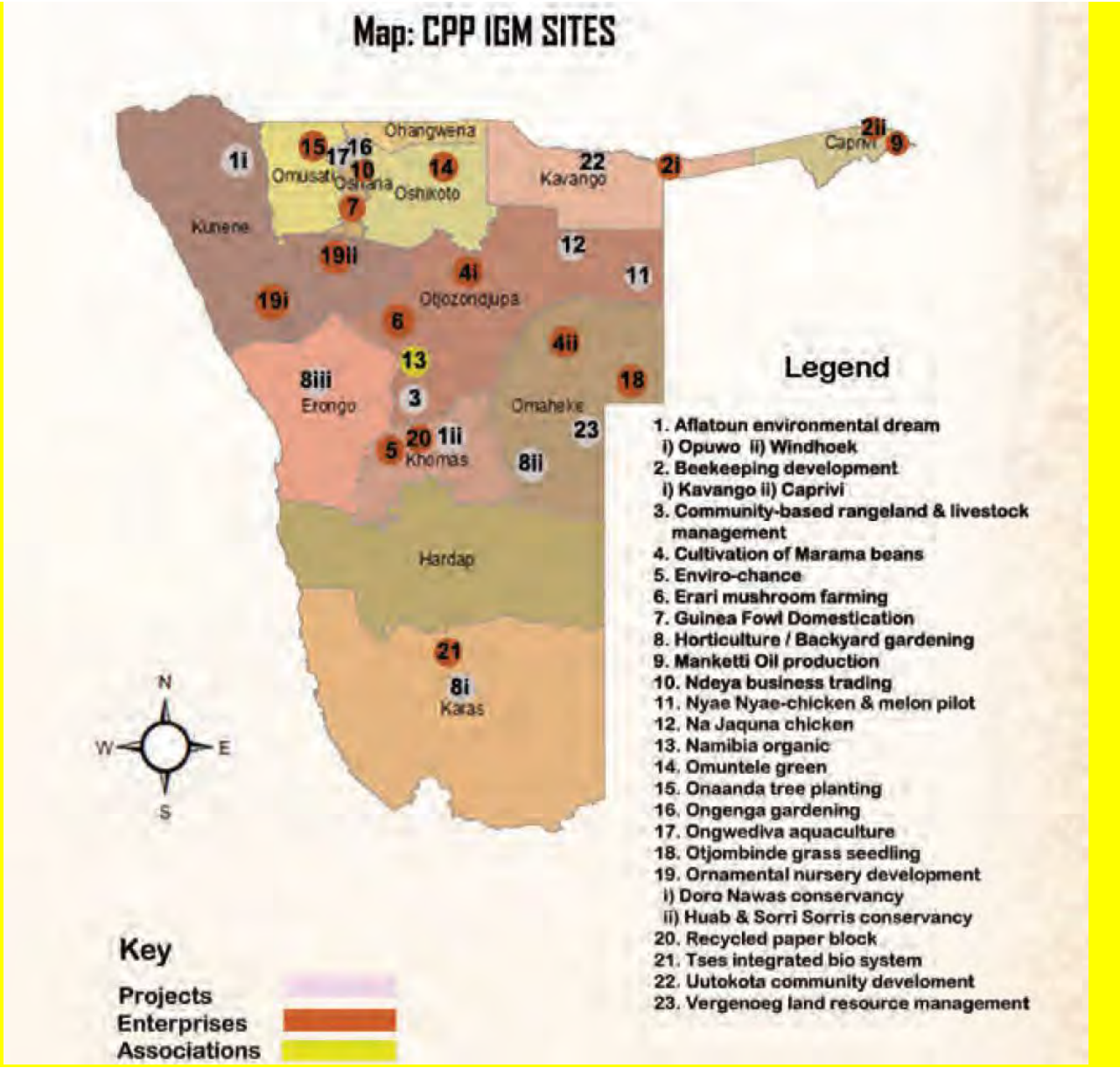

Figure 9: Similar Country Pilot Partnership for Integrated Sustainable Land Management (CPP-ISLM) project in Namibia

The area of overlap with –Urban and Peri-Urban Horticulture Development" of MWAF will be very similar; however, this project by focusing to rural community for climate resilience will make it is complementary nature. In this two regions there is no such project initiative's at all.

The CPP-ISLM project will be used as best model for project design for lessen to be learned from the reports of CPP-ISLM and also visiting the existing projects that will enable this project to coordinate the implementation of this project with the above existing, for example during training

the use the successful farmers to demonstrate their experience and also with regards to project management.

G. Description of learning and knowledge management

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

- **Technical Reports:** The report will include the economic, social and environmental benefit of the project. The process followed to implement the project that may include planning, organizing, coordination of the project and controlling process followed. All best practices having significant impact on Technical report, summarising all the technical processes followed in implementation of the activity, its cost economics and impact on the communities.
- **Pamphlet:** Pamphlet is also among the dissemination strategies for the lessons learned on this project
- **Regional workshops:** there are number of annual regional workshops in Namibia, that includes farmers day, Ongwendiva trade fair and Windhoek Trade fair will be among the platform to disseminate lessons learned
- **Publications:** the following different publication strategies would also use to disseminate information
    - Magazine and Newsletters
    - Scientific publications
    - Conference proceedings
- **Mass media (radio services) :** one of effective information dissemination strategies will be radio as it is used widely in Namibia
- **Facebook, WhatsApp and twitter :**for wider dissemination strategies also social medias will be also applied.

H. Description of consultative process

H. Describe the consultative process, including the list of stakeholders consulted, undertaken during project preparation, with particular reference to vulnerable groups, including gender considerations.

Consultation process and selection criteria

During development of the concept note and proposal, consultations were conducted, through telephone, face-to-face meetings and email communications, with stakeholders. The following stakeholders supported the project development process:

- The local traditional authority in the Okakarara Constituency (Otjozondjupa region): Okakarara Traditional Authority (i.e. Chief Vihanga and his councillors), village water point committees of the Ongarangombe, Omboora and Okahitua villages. Chief Vihanga consulted his councilors, held meetings at village levels to assist with selection of beneficiaries and after some consensus was reached the proposal development team visited the villages and held meetings with representative of villages through their waterpoint committees. This process was repeated for the Otjinene constituency (below). In the context of the existing local institutions, the process followed was comprehensive.
- The local traditional authority in the Otjinene Constituency (Omaheke region): Maharero Royal House Traditional Authority (i.e. Senior CouncillorKatjiuanjo and his councillors), village water point committee of the Okotjivango village;
- The local traditional authority in the Otjinene Constituency (Omaheke region): Ovaherero Traditional Authority (i.e. Senior CouncillorKambirongo and his councillors), village water point committee of the Otjiteke village;

Specific meetings were held with the targeted communities upon invitations by the local leadership to specifically clarify the intend of the proposal, beneficiary selection, thus select sites and the role of direct beneficiaries. This discussions were held with the targeted communities on the 20th May- (meeting venue: Ozongarangombe village, Otjozondjupa Region) and 21st May (meeting venue: Otjinene, Omaheke Region). These meetings have also resolved that the current WPCs of targeted villages can assume additional role of managing the proposed Action on the day-to-basis in a

fashion of a _producer cooperative' but with some additional tasks. The diagram below shows the organogram of a strengthened WPC as envisaged for each beneficiary community.

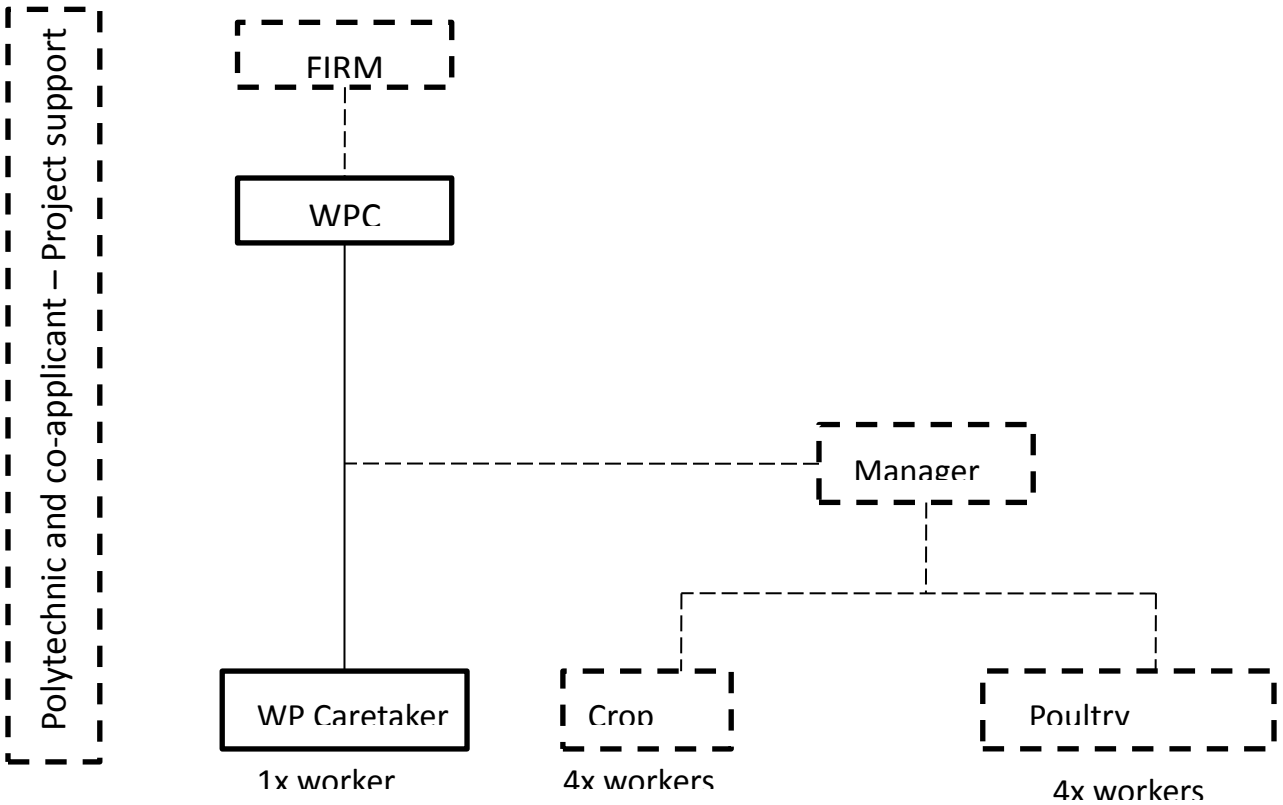

Figure 10: Organogram for the project implementation

(Dotted lines show the portfolios added to the existing water point committee structure.)
Source: M. Katjiua

Table 12: consultations objectives and outputs

Objectives	Outputs
Community mobilisation	Active participation and buying of the project proposal achieved
Awareness raising on climate change adaptation	Communities become aware and understand the impact of climate change; communities observe local trends in climate change impacts on livelihoods
Setting selection criteria for targeted localities (villages)	Four villages select out of 200 villages in the two constituencies
Enhancing the role of women and vulnerable groups in the communities	Agreed on the participation and involvement of of women and vulnerable groups on project management and implementation
Agreeing on project management	Agreed to expand the role of WPC to incorporate

modalities	project implementation

The Criteria for the Selection of Targeted Villages

The purpose for devising site selection criteria were to:

- Reduce any potential bias in the selection of villages in which the project will be implemented;
- Increase the success rate of the project implementation
- Ensure institutional sustainability, financial sustainability and environmental sustainability.

Hence the following site selection criteria were used:

- Site with a borehole that has ***high water yielding capacity*** (about 15 to 20 metric cubic per hour) compared to 10 to 15 metric cubic surrendering area
- Selected villages with high water yield was selected
- The water source is widely distributed within the selected villages
- Ground water in the selected villages is considerably shallow (60 to 100 m deep) compared to sounding areas about 350m deep
- The area receives mean rainfall about 400mm annually; with lower run off which is potential higher recharge rate, due to Kalahari sedimentation soil type (also it is important to take note that, even though irrigation techniques system to be used will be geared toward ***water conservation and water use efficiency***).
- Borehole has to have very ***good water quality***. The temporary selection of two sites (priority 1 and priority 2) in each constituency is to allow for final selection following laboratory chemical analysis of water samples;
- Multi-family village set up to allow for community-based management approaches;
- Secure land tenure, i.e. land users must have secure customary land rights to the land parcel; and
- Site must be easily accessible to all members (in terms of distance or any restrictions).

The Criteria for the Beneficiary Community of Targeted Villages

It may be the a very good site is selected, but the beneficiary community may be a non-starter. Hence the criteria for the selection of the beneficiary community, these are:

- High community cohesion;
- Defined membership;
- Well-established and functional self-organisation;
- Experience with working with community finances; and
- Female and youth involvement.

Table 13: Demographics of the Selected Villages

	Otjozondjupa region		Omaheke region	
	Okakarara constituency		Otjinene constituency	
	Ozongarangombe	Omblooronde	Okazapamba	Otjiteke
GPS – village location	S20°51‘01.84‘‘, E17° 51‘35.38‘‘	S20°49‘06.76‘‘, E17° 41‘13.66‘‘	S20°51‘01.84‘‘, E17° 51‘35.38‘‘	S20°51‘01.84‘‘, E17° 51‘35.38‘‘
No. Households	46	35	45	15
No. Female headed households	12	8	11	4
Population size	184	140	180	60
Size of land made available	8 ha	7 ha	7 ha	10 ha
Constituency population (indirect beneficiaries)	22 747		7306	

- Ministry of Agriculture, Water and Forestry (MAWF)
- Ministry of Youth and National Service, Sport and Culture
    - The Ministry has expressed willingness to provide its facilities in Otjinene for the training of project beneficiaries when needed.
- The Otjinene Farmers Association:
    - All residents of Otjinene constituency are automatically members of the Association and do benefit from subsidized vaccines and livestock supplements
- Peter Kawana of Farm Schwarzfelde no 180, around Grootfontein farming with small irrigation and livestock;

- University of Free State: Department of Soil, Crop and Climate Sciences
- AGRICONSULT NAMIBIA private consultant , Dr. Axel Rothauge

I. Justification for requested funding

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

As indicated in –PART –I"; livestock production in the form of cattle, goats and sheep predominate the agricultural sector in Namibia. Thus exacerbating environmental related problems, while it is necessary to satisfy daily needs, improved nutrition and direct income from livestock, it is also necessary to alleviate environmental stress. Hence the need to diversify into poultry, crops and other high value fruit (citrus fruit) in such a way that extensive land degradation can be minimised, while communities receive better income and nutrition. This project will have three major components that include promoting Integrated Farming System (IFS) and knowledge and capacity development management, as presented in Figure1.

Therefore, introduction of an integrated farming system in Namibia will be achievable, acceptable profits and sustained production levels, while minimising the negative effects of intensive farming and preserving the environment. And it can be idle solving problems associated with poor agricultural productivity, soil degradation and nutrition issues.

The lack of adequate food production and access to food depending to South Africa is already a concern and causing high food price in Namibia, specifically, rural female households the hardest high of this high food price becomes a question of life and death for hundreds of women in the rural areas. Frequent occurrences of droughts and flooding events; low local adaptation is threatening food security and livelihoods of rural communities.

Without concrete adaptation actions and livelihood support, the baseline scenario will see a continuing deterioration of agricultural productivity and household food security.

The Government's national strategies and programs reflect a commitment to tackle the impacts of climate change and, in particular, to put in place an enduring response to the unsustainable use of natural resources and food insecurity. In an effort to alleviate poverty, the government has created a Ministry for Poverty Alleviation to address poverty and income disparities among the population of

Namibia. This project is in line with the goal of the government objectives to diversify income and reduce poverty.

J. Description of sustainability of the project outcomes

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

The approach will also lead to the creation of models which are expected to be replicated in the project area and beyond. The project will leave behind a significantly strengthened group of people working in Government technical services that will be able to interact with the most vulnerable populations; and replicate successful methodologies and approaches.

Below government offices have direct connection to support farmers, farming system and rural communities. During the project implementation the following will further be involved to ensure replicability and sustainability of the project is achieved:

i. Ministry of Agriculture, Water and Forest (MAWF)

ii. Ministry of Youth and Sport

iii. Ministry of Gender Equality and Child Welfare

iv. Ministry of Land reform

v. Ministry of Poverty Eradication and Social Welfare

vi. Ministry of Urban and Rural Development

vii. Ministry of Public Enterprise

viii. Ministry of Industrial Trade and SME development

ix. Previous participants of the Country Pilot Partnership for Integrated Sustainable Land Management (CPP-ISLM) programme will continuously be engaged.

Table 14: Summary of sustainability outcomes

Outcomes	Sustainability plan	Risk and assumptions
Outcomes 1: Improved preparedness to adapt to adverse climate variability and climate change impact.	Use effective outreach plan, as indicated on the knowledge management; Trainers training	Final beneficiaries will actively participate in the action and will take the necessary ownership of project (action). Project staff willingness to be trained Beneficiaries interested in training and willing and capable to absorb and apply training and capacity strengthening.
Outcome 2: Market research completed for the produce, combination of production and specific value addition	Well prepared research proposal, tools, market research techniques, and workshop to increase awareness about the research.	Active leadership of regional stakeholders. Qualified and capable of students to conduct research and available to continuously support of the project from stakeholders Good community cohesion
Outcome 3: Improved knowledge and skills of communities to increase resilience to climate change threats on the existing farming system; and implementation of livelihood option for climate change and adaptation.	Effective communication-collection and dissemination information to all stakeholders about project activities and progress	Committed students, staff to accomplish their daily operation
Outcome 4: Improved income and nutrition from IFS	Procurement – the sourcing of all materials required to implement the project – planning, solicitation, source selection, contracts Integration – ensuring that different aspects of project will fit into one whole, coordination of contribution of all project participants	The water and soil suitability for the IFS; Active leadership of regional stakeholders. Qualified implementing partners are available to continuously support the project Good community cohesion
Outcome 5: Improved knowledge and skills of students relating to resilience to climate change threats on the existing farming system; and research produced related to IFS and climate change and adaptation.	Select students from the area, very active and good students; and put mechanism for evaluation and minoring their progress	Students interest to participate

Micro-irrigation of fruit trees and vegetables will be a new activity that will provide the opportunity for learning and adoption of this technology in the broader pastoral communities of the two regions.

The proposed expansion of the role of Water Point Committees will provide the opportunity to develop institutionally. Added capacity building interventions will ensure good governance and social learning.

Technical aspects

  - Inputs – will necessary inputs be available, where they will be sourced, how to get the inputs to project site
  - Outputs – will the right quality and quantity of inputs be produced, are the appropriate facilities available to handle and store outputs, how to transport outputs to markets
  - Technical solutions and the social systems – ensuring that chosen technical solutions do not lead to conflicts with the local social systems
- Identification and quantification of risk factors that may impede project implementation and attainment of the project objectives, development and effecting plan to minimise adverse effects on project
- Procurement – the sourcing of all materials required to implement the project – planning, solicitation, source selection, contracts
- Integration – ensuring that different aspects of project will fit into one whole, coordination of contributions of all project participants

K. Overview of the environmental and social impacts and risks analysis

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

Table 15: Environmental and social impacts and risks analysis

Environmental risk management		
Risk types	**Main risk factors**	**Complains**
Soil	Ploughing and tillage	Not required
Water	Suitability of underground & pollution	Not required, as there is no new borehole to be drilled
Natural habitats	Lack of protection for natural habitats	Not required; as there is no negative effect on natural habitants
Biodiversity	Risk of lack of biodiversity protection	Not required; as there is no negative effect on natural habitants
Social risk management		
Risk types	Main risk factors	Complains
Exclusion for vulnerable groups (specially female)	Influencing using cultural and tradition to exclude for vulnerable groups (specially female)	It is an established practise that gender considerations and youth empowerment is given priority

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

The overall objective of environmental and social monitoring will ensure that mitigation measures are implemented and are effective. Environmental and social monitoring will enable response to new and developing issues of concern during implementation hence ensuring compliance with environmental provisions and standards of the Government of Namibia. The overall responsibility of the environmental and social monitoring will lie with the Ministry of Agriculture, Water and Forestry (MAWF). The ESMP will focus on monitoring: (i) the status of the biological conditions; (ii) status of the physical works; (iii) the technical and environmental problems encountered; (iii) proposed solutions to the problems encountered; and, (v) the effectiveness of environmental and social mitigation measures adopted

Table 16: Environmental and social management plan

Aspects to be Monitored	Project phase	Monitoring indictors	Frequency of Monitoring	Institution/agency to monitor
Land preparation & clearing	Construction	ESIA reports Adherence to laid down legal and policy requirements	Once	Executing entity
Environmental conditions during the irrigation infrastructure development • Status of the biological conditions • Assessing the status of the physical works • Follow up on mitigation measures • Assess effectiveness of environmental and social measures adopted	Construction and operational phases	Number of meetings planned and held; Record of meetings that took place ES baseline report	Quarterly	Executing entity
Water and soil conservation and management programmes • Status of the biological conditions • Assessing the status of the physical works • Follow up on mitigation measures Assess effectiveness of environmental and social measures adopted	During implementation	Number of meetings planned and held; Environmental baseline reports compare with current status soil & water	Quarterly	Executing entity
Institutional strengthening and capacity building	All stage	Training report	Quarterly	Executing entity

Grievance process mechanism: Grievance mechanism will be adopted as presented in Figure 11 indicated that grievance/ complaint can be submitted either via a grievance on writing or verbally. A grievance can be submitted to the WPC or to the project manager

All grievances received will be forwarded to the through WPC to Forum for Integrated Resource Management who will be responsible for recording and processing grievance/complaints, grievance Response mechanism will be:

- Grievance received;
- Grievance recorded in the Grievance/ complaints Register;
- For an immediate action to satisfy the complaint, the complainant will be informed of corrective action;
- Implement corrective action, record the date and close case;
- For a long corrective action, the complainant will be informed of proposed action; and
- Implement corrective action, record the date and close case.

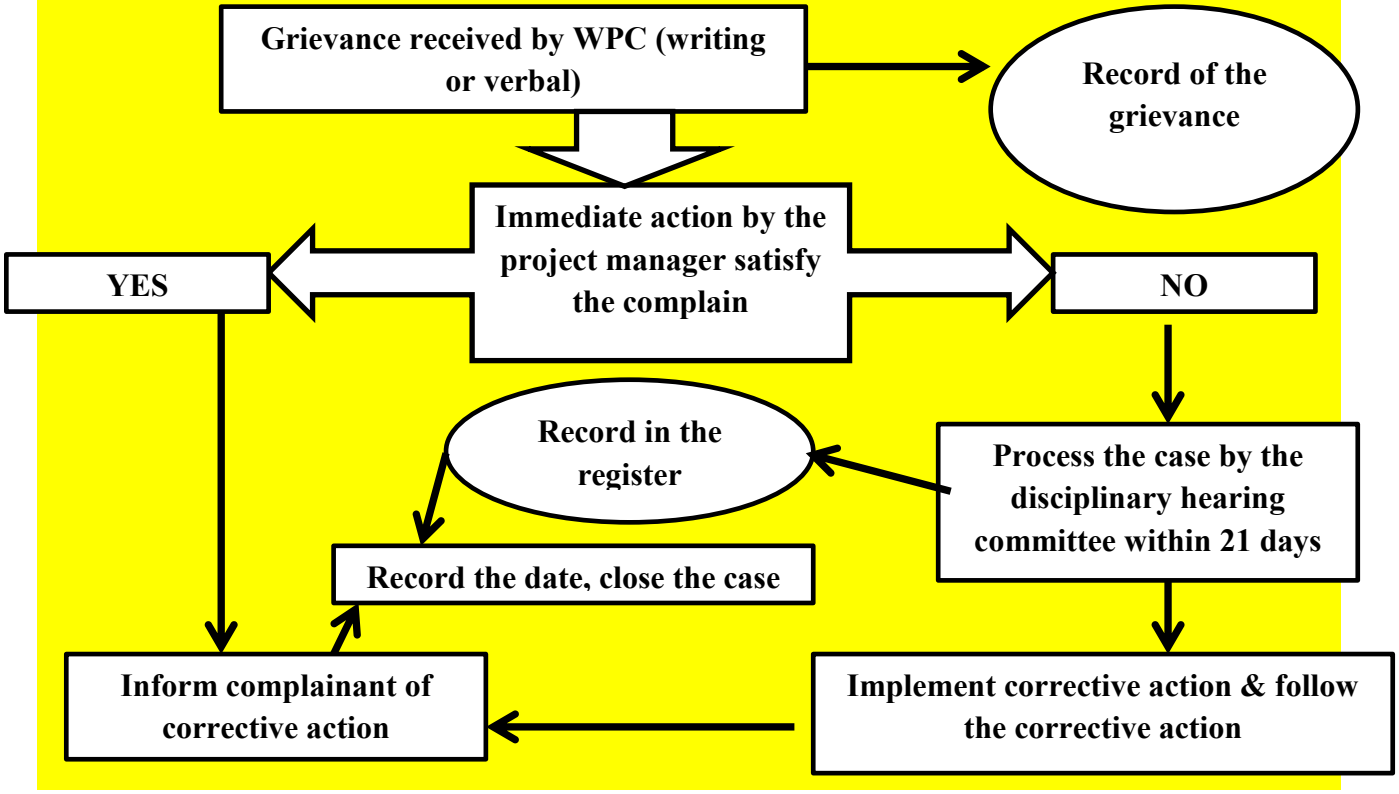

Figure 11: Grievance process on the project

PART III: IMPLEMENTATION ARRANGEMENTS

A. Description of project management arrangements

A. Adequacy of project management arrangements.

The methodological approach that will be used for the implementation of the proposed action is very critical for the successful implementation of the project. The agreed approach is discussed with a variety of stakeholders in the NGO sector (NNFU and AgriFutura), the targeted communities, and academics at the Polytechnic of Namibia. We have meticulously considered a number of implementation scenarios, consciously knowing that community projects continue to fail because of challenges associated with the _prisoner's dilemma' and _free-rider problems'. Hence it is difficult to sustain newly created organisational set ups with new rules and procedures, to ensure the long-term existence and economic viability of such entities. Our discussions with targeted communities, academics and players in the NGO sector indicate that a "producer cooperative" approach is the most appropriate. In the absence of defined and functional village-based producer cooperatives, the existing Water Point Committees are the most functional organisations that create rules of governance and manage water infrastructure and finances at the village level.

How the Proposed Action will build on Existing National Programmes

Since 1995 the Government of the Republic of Namibia has embark on community-based programmes to empower rural communities, these are conservancies (focusing on wildlife), community forestry and village water point committees. This proposed action will specifically build on the existing village water point committees (WPCs). Namibia is a dry country with very limited perennial surface water sources; hence the government has drilled boreholes for rural communities and handed all management of water and water infrastructure to residents of the different villages across the country during the late 1990s. A village community elects its WPCs on a regular basis and employs a water point Caretaker which it pays on a monthly basis. The WPCs collects village membership fees and livestock fees which mainly becomes the annual budget for the maintenance of water point infrastructure, lubricants and fuel, travel and subsistence, and the wage the Water Point Caretaker. The funds are kept in a Post Office bank account, for which three committee

members have signing rights. In most cases the WPCs have expanded their mandate to controlling access to use of natural resources (grazing, timber, water pans and medicinal plants) within the designated periphery boundary of the village. The WPC is the lowest community-level governance structure in villages.

Therefore the WPCs of the targeted villages will be the direct operatives of the proposed action, the Community-based Integrated Farming System for Climate Change Adaptation Project. Partly the selection of the targeted villages was based on the existence of strong, well-functioning WPCs which will make the project implementation much easier and institutionally sustainable.

Organisational Framework for the Implementation of the Proposed Action

The National Implementing Entity (NIE) is contracted by the Adaptation Fund (AF) to execute the oversight role for projects/programmes funded through the AF. In this role, the NIE plays several roles which include overall project monitoring and evaluation as well as administration of the funds received through the AF. Furthermore the NIE played a critical role during the development of the proposal through guidance and advice as well as quality assurance of the conceptual and project design. This was done through a briefing session with project applicants as well as on-going consultations.

On a more practical level, our discussions with the targeted communities on the 20th May (meeting venue: Ozongarangombe village, Otjozondjupa Region) and 21st May (meeting venue: Otjinene, OmahekeRegin) have resolved that the current WPCs of targeted villages can assume an additional role of managing the proposed Action on the day-to-basis in a fashion of a _producer cooperative' but with some additional tasks. by strengthened WPC as envisaged for each beneficiary community (*see* Figure 6: Organogram for the project implementation)

- *Forum for Integrated Resource Management (FIRM)*

The United Nations Convention to Combat Desertification (UNCCD) encourages the involvement of local people in decision-making regarding the kind of interventions required to address their needs in combating desertification and land degradation, and in devising strategies to deal with climate change. In its response the Namibia Programme to Combat Desertification (Napcod) in

partnership with community-based organisations promoted and applied the FIRM approach (Napcod, 2003) to ensure local ownership and leadership of development priorities by the local communities themselves. The forum affords a space for project affiliates and other stakeholders to contribute to the development of the community. The community identifies its needs for technical, planning and financial support for their development, and then involve the specific stakeholders / affiliates to assist in meeting the community needs. The role of the FIRM is mainly supportive and advisory.

As far as this project is concerned, the members (and their roles) of the FIRM will be:

- Ministry of Agriculture, Water and Forestry (MAWF)
- Directorate of Extension and Engineering Services
  - Extension services in crop production: seed supply
- Directorate of Rural Water Supply
  - Training of Water Point Committees
- The Polytechnic of Namibia (to be the Namibia University of Science and Technology).
  - Convene FIRM meetings
  - Provide feedback on progress of project implementation (M&E report)
- Ministry of Youth and National Service, Sport and Culture
  - The Ministry has expressed willingness to provide its facilities in Otjinene for the training of project beneficiaries when needed.
- The Otjinene Farmers Association:
  - All residents of Otjinene constituency are automatically members of the Association and do benefit from subsidized vaccines and livestock supplements
- The Water Point Committee is also a member of the FIRM
- Farm Schwarzfelde no 180, around Grootfontein farming with small irrigation and livestock; owned and managed by Peter Kawana
- *Water Point Committee (WPC)*

The WPC is really the village governing body! In addition to the existing roles and responsibilities the committee will:

- Carry out recruitment and dismissal of workers of the project which will be the manager and the workers for the Crop Production, fruit and Poultry components;
- Decide on work that is going to be carried by all members from time to time;
- Design, with the facilitation of the Polytechnic's Project Director, the members benefit sharing mechanisms;
- Maintain registry of members;
- Maintain and safe-keeping the inventory of project assets;
- Create and manage the community project bank account;
- Distribute benefits among members;
- Identify training needs of community members;
- Solely be responsible for the maintenance of the infrastructure and ensuring the security of all project assets;
- Source markets for produce; and
- Decide on remuneration of employed members on the project.
- Liaise with the Project Director

- *Project Manager*

A capable project manager will be recruited for each of the targeted communities. A relevant post-matric qualification will be a pre-requisite for the position. The founding project manager will be recruited by Polytechnic in consultation with the project beneficiaries. Ideally this position will be filled by a local person. This will be a paid position just as is the case with the Water Point Caretaker. The main function of the project manager will be mainly be operational.

The roles and responsibilities will be:

- Ensure the day to day smooth operations of the integrated farming system
- Keep production records;
- Update registry of project assets and submit copies to WPC
- Create a registry of project members (= beneficiaries).
- Keep records of project members involvement in project work

- Keep a duty roster of workers and record leave days, absence, etc.
- Ensure functioning of infrastructure at all times.
- Report any misfit and or malfunctioning in the system to the chairperson of the WPC.
- Do marketing of produce that is in excess of the locally-agreed consumption levels;
- Attend capacity building interventions for the operations of the integrated farming system.

- *Project Workers*

The WPC and the Project Director will recruit project workers from the registered members of the local community. The roles and responsibilities will be:

- Carry out all duties and tasks required and as will be assigned by the Project Manager (and by trainers assigned by the Applicant and Co-Applicant or the Applicant and Co-applicant themselves during the initial stages of the project implementation);
- Attend all capacity building interventions provided for all the various components of the integrated farming systems. All workers will attend interventions for all the component of the system.

- *The Village Community*

One of the central tenets in community-based organisations is that membership must be clearly defined; hence all village residents who want to be part of the project will be registered. The WPC will convene a community meeting where members will deliberate on their expectations, roles and responsibilities in the project. Amongst others, the following will form the basis on the discussion members‘ contributions (e.g. labour or in-kind), monitoring, policing, participation in project tasks and capacity building interventions, and update themselves on project operations.

B. Measures for financial and project risk management

B. Measures for financial and project risk management.

The following risks and mitigation measures are considered during this action.

Table 17: Risk factors and mitigation measure analysis

Risk types	Main risk factors	Mitigation measures
Political	Political interference	The action will be implemented within national goals and priorities thus adhering to national and regional legislative frameworks. Political buy-in would be solicited through component 1 (community mobilisation), in addition to this through the exposure trips and policy briefs.
Delay in project implementation	External factors may delay project implementation	The project is a high priority of the Government, and will receive support where difficulties are encountered
Socio-economic	Lack of partner buy-in (no commitment / interest from partners beyond the initial phase)	This will be dealt with from the on-set of the initiative through forming strategic partnerships with clear incentives from all involved stakeholders. Cooperation principles will be identified through with institutional procedures and capacity development for the components. The participating parties operate within a signed MoU and hence have already agreed on common vision and collaboration.
	Impractical technology options	Technology is demand based and identified by the users, hence fostering ownership over process. This will be addressed through Component 2.
Physical	Geographical barriers to share S&T data	The establishment of the proposed technology model will be adapted and will from the on-set identify common unifying approaches, while recognising physical (Geographical) elements.
Financial	Failure to achieve financial sustainability by the end of the project. Failure to attract third party funding beyond initial phase	During expansion will address this risk through developing an exit strategy from the beginning of the action. The community water point committees would also add to sustainability of the action.

Human capacity	Lack of proper/ strategic leadership in management team	The Coordinator of the action has vast experiences in dealing with similar actions and as such has appropriate skills at project design, management and implementation levels. Appropriate templates and reporting structures and procedures will be put in place to ensure smooth project management in accordance to project objectives and goals.
	Poor experienced/ qualified staff recruited for the project in later years	It is envisaged that the Initiative participants will also benefit from the comprehensive capacity development programme planned through this initiative hence addressing the staff quality risk, while operating on results based principles would boost the reputation.
	Inadequate trainers	International and local industry experts will be used as resource persons while building capacity in local trainers. The capacity development will appropriate address this risk.
Quality	Compatibility of technology and quality results	Address quality control and assurance issues through ensuring that relevant national stakeholders are involved in the process from the beginning of the programme to facilitate the technology identification and transfer process.

C. Description of measures for environmental and social risk management

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

Risk Type	**Risk factors**	**Risk rank**	**Mitigation measures**
Environmental risk management			
Soil	Plowing and tillage	Low	Appropriate crop rotation, minimal and zero soil tillage technologies
Water	Suitability of underground	Moderate	Regular laboratory control of local water resources.
	Water pollution	Low	Regular laboratory
Natural habitats	Lack of protection for natural habitats	Moderate	The project interventions have been identified in consultation with the local
Waste management	Risk of waste pollution	Low	Promotion of integrated plan for waste management, as it is integrated there is not waste

Biodiversity	Risk of lack of biodiversity protection	Moderate	Protection of local biodiversity features (rivers, wetlands, habitats etc)
Social risk management			
Exclusion for vulnerable groups (specially female)	Influencing using cultural and tradition to exclude for vulnerable groups (specially female)	Low	The project is basically aimed at providing alternate climate resilient livelihood options to agriculture dependent
Gender equity empowerment	Risk of ignoring female in empowerment	Low	The project is proposed for agriculture dependent community, women bear the responsibility of agriculture
Socio-economic	Lack of affiliates buy-in (no commitment / interest from partners beyond the initial phase)	Moderate	This will be dealt with from the on-set of the initiative through forming strategic partnerships with clear incentives from all involved stakeholders. Cooperation principles will be identified through with institutional procedures and capacity development for components. The participating parties operate within a signed MoU and hence have already agreed on common vision.
	Impractical technology options	Low	Technology is demand based and identified by the users, hence fostering ownership over process. This will be addressed through component 2.

D. Monitoring and evaluation arrangements

D. Monitoring and evaluation arrangements including budgeted M&E plan.

In this project, the results frameworks illustrate the direct relationships between the intermediate results of activities all the way to the overall objectives and goals. That show the causal relationship between project objectives and outline how each of the intermediate results/ outputs and outcomes relates to and facilitate the achievement of each objective, and how objectives relate to each other and the ultimate goal. Results frameworks do form the basis for monitoring and evaluation activities at the objective level.

That includes the following different combinations of M&E documents will be used:

- **Quarterly report:** Quarterly monitoring reports will be prepared
- **Annual Report:** Annual Report is an extensive key report which is prepared to monitor progress made since project start and in particular for the previous reporting period. This will be assessed by Project Director and would be submitted to project managing board.
- **Periodic field Survey report:** all field survey, visit and demonstrations and any experimental testing will be documented and monitored
- **Mid-term Assessment Report:** The project will conduct mid-term review
- **Terminal Evaluation Report:** Three months prior to completion of the project, an independent

As shown below figure the mentoring and evaluation will follow good practise of M & E system as indicated in the figure below.

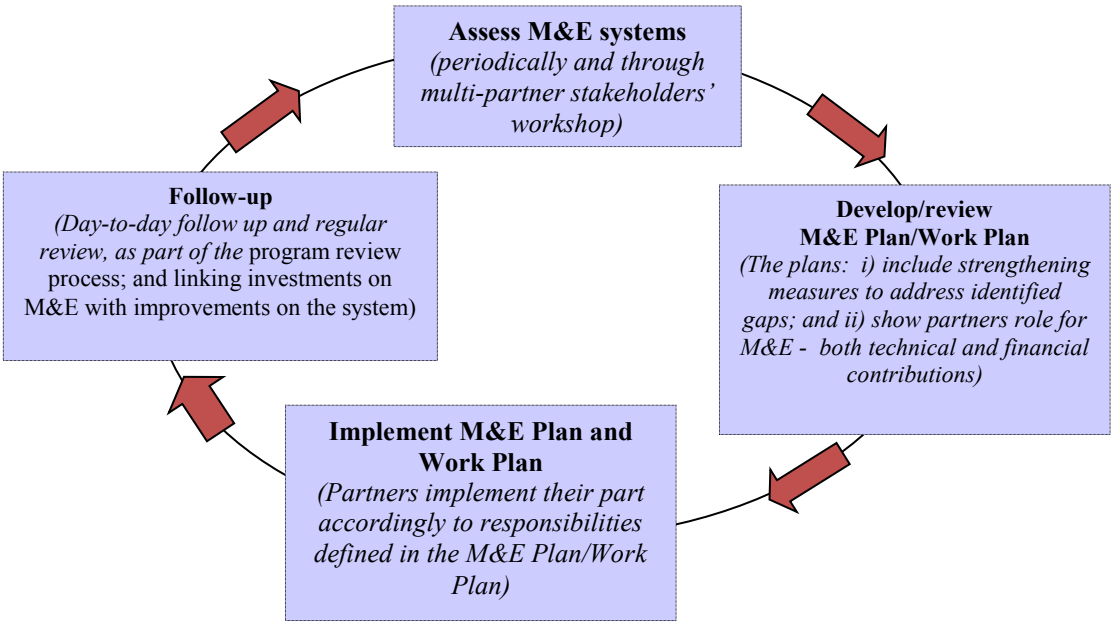

Figure 12: Mentoring and Evaluation cycle

Table 18: Monitoring & Evaluation (M&E) Framework

Component 1: Capacity building & awareness raising					
Objective	***Increased understanding and capacity of the communities to promote and undertake diversified livelihood adaptation measures***				
Outcomes	***Strengthening of community-based organisations to enhance participative and community-driven adaptation planning***				
Outputs	***Community mobilisation to promote sustainable livelihood farming systems to adapt to climate variability and climate change.***				
activities	**Indicator**	**data source**	**Frequency**	**responsible**	**cost ($)**
Workshop	Number workshop facilitated & people attended	Register record and level of satisfaction feedback report	Three times during project period	Polytechnic of Namibia, Agriconsult & University of Free state	**10 400**
Training	Number training facilitated & people attended	Register record and level of satisfaction feedback report	Two times during project period	Polytechnic of Namibia, Agriconsult & University of Free state	**10 524**
Component 2: Market research					
Objective	***Identify market opportunities and specification of value addition***				
Outcomes	***Market research completed for the produce, combination of production and specific value addition***				
Outputs	***Number and type of produce identified for possible value addition and market***				
activities	**Indicator**	**data source**	**Frequency**	**responsible**	**cost ($)**
Conducting market situational analysis	Specific market potential, specific product customers need & specific value addition identified	Market research report	One time during project period	Polytechnic of Namibia, Agriconsult & University of Free state	**11 320**
Component 3: Strengthen Traditional farming system					
Objective	***Increase application of appropriate farming system on rangeland management and livestock production***				
Outcomes	***Improved knowledge and skills of communities to increase resilience to climate change threats on the existing farming system***				
Outputs	***Number of community members trained on current farming system***				
activities	**Indicator**	**data source**	**Frequency**	**responsible**	**cost ($)**
Production of model	Number manuals produced	Course guide manual and level of satisfaction feedback report for material	One time during project period	Polytechnic of Namibia, Agriconsult & University of Free state	**700**
Training	Number training facilitated & people attended	Register record and level of satisfaction feedback report	Two times during project period	Polytechnic of Namibia, Agriconsult & University of Free state	**3352**
Component 4: Implementation of IFS					

Objective	***Design and implement integrated faming production system and infrastructure to climate change induced risks & build long-term resilience to climate change***				
Outcomes	***Outcome-1:Improved income and nutrition from poultry production***				
	Outcome-2: Improved income and nutritional value from horticulture and fruit production				
Outputs	***Output 1: planning and construction of poultry infrastructure completed***				
	Output2: planning and construction of horticulture and fruit production completed				
activities	**Indicator**	**Data source**	**Frequency**	**responsible**	**cost ($)**
Acquisition of production inputs & infrastructure	Number manuals produced	Course guide manual and level of satisfaction feedback report for material	One time during project period	Polytechnic of Namibia, Agriconsult & University of Free state	**700**
Laboratory soil tests	Number training facilitated & people attended	Register record and level of satisfaction feedback report	Two times during project period	Polytechnic of Namibia, Agriconsult & University of Free state	**3352**
Irrigation infrastructure installation	Irrigation system installed	Physical infrastructure & asset records	One time during project	Contractor + polytechnic of Namibia+WPCs	**206 776.01**
Acquiring implements	Number of implement purchased	Financial statement records	One time during project	Contractor + polytechnic of Namibia+WPCs	
Component 5: Student involvement, capacity building & knowledge management					
Objective	***Conducting research on integrated farming system and ways to transform information knowledge***.				
Outcomes	***Improved preparedness to adapt to adverse climate variability and climate change impact.***				
Outputs	***Community mobilisation to promote awareness of sustainable livelihood diversification and integrated farming systems to adapt to climate variability and climate change***				
activities	**Indicator**	**data source**	**Frequency**	**responsible**	**cost ($)**
Registered students identification and attached to the project	Number of students completed their project	Research project reports	One time during project period	Polytechnic of Namibia & University of Free state	**137 600**
Information dissemination	Number of papers related to IFS published and/or conference presented	Publication reports	One time during project period	Polytechnic of Namibia & University of Free state	

E. Results framework for the project proposal

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

Table 19: Summary of results framework

	Realistic, quantified expected results				
The overall objective of the project to enhance sustainable livelihoods through integrated farming system (i.e fruit, poultry and vegetable production) and strengthening the capacity on the existing livelihood sources (livestock production and rangeland management).					
Indicator	**Indicator**	**Baseline**	**Target**	**Source of verification**	**Risk & assumption**
Outcomes 1.1: Improved preparedness to adapt to adverse climate variability and climate change impact.	The project have played an active and supportive role in the mobilisation, organisation and implementation of inter-village adaptation planning process for IFS	Communities have been mobilized, supported the project and WPC resumed IFS structure on their management structured also relevant supported received from stakeholders, and good relationship established	Regular contact and trustful relationship with communities & stakeholder & Revised guidelines of operational management for WPC	Copies of training agenda/manual and copies of publications	Beneficiaries interested in training and willing and capable to absorb and apply training and capacity strengthening
Output 1.1: Community mobilisation to promote awareness of sustainable livelihood diversification and integrated farming systems to adapt to climate variability and climate change.	Preparation and communication to regional level of up-to-date and reliable information and analysis of IFS as government priorities	There is little awareness on climate change and impact on the livelihood	Regular contact and trustful relationship with communities & stakeholder	Copies of training agenda/manual and copies of publications	Beneficiaries interested in training and willing and capable to absorb and apply training and capacity strengthening.

	Realistic, quantified expected results				
The overall objective of the project to enhance sustainable livelihoods through integrated farming system (i.e fruit, poultry and vegetable production) and strengthening the capacity on the existing livelihood sources (livestock production and rangeland management).					
Indicator	**Indicator**	**Baseline**	**Target**	**Source of verification**	**Risk & assumption**
Outcome 2.1: Market research completed for the produce, combination of production and specific value addition	Market research completed to guide for production type, quantity and value addition	There is no market research	Specific production commenced based on customers need	Research report	Interested students on the topic and successfully completion of the research
Output 2.1: Number and type of produce identified for possible value addition and market	Number of volume marketed and value added	No produce marketed	The region of respective project site	Records of produce marketed	Active regional stakeholders participation and good customers need for the produce and products
Outcome 3.1: Improved knowledge and skills of communities to increase resilience to climate change threats on the existing farming system	The project have played an active and supportive role in the mobilisation, organisation and implementation of inter-village adaption planning process for improved farming system on the existing farming system	Communities have been mobilized, supported the project and t supported received from stakeholders, and good relationship established	Regular contact and trustful relationship with communities & stakeholder & Revised guidelines of operational management	Copies of training agenda/manual and copies of publications	Beneficiaries interested in training and willing and capable to absorb and apply training and capacity strengthening

	Realistic, quantified expected results				
The overall objective of the project to enhance sustainable livelihoods through integrated farming system (i.e fruit, poultry and vegetable production) and strengthening the capacity on the existing livelihood sources (livestock production and rangeland management).					
Indicator	**Indicator**	**Baseline**	**Target**	**Source of verification**	**Risk & assumption**
Output 3.1 Number of community members trained on current farming system	Number training facilitated & people attended	There is no training on existing farming system	The project beneficiaries	Register record and level of satisfaction feedback report	Beneficiaries interested in training and willing and capable to absorb and apply training and capacity strengthening
Outcome 4.1: Improved income and nutrition from poultry production	Records of production for poultry enterprise	There is little local poultry production, but not intensified with in integrated form	Production to be commenced in the phase of the project	Records of produce distributed among the community members, and sales records. Household food consumption survey (baseline vs after intervention)	Active leadership of regional stakeholders. Qualified implementing partners are available to continuously support the project Good community cohesion
Output 4.1.1: planning and construction of poultry production completed	Infrastructure for poultry installed and functioning	There is no well-developed poultry system in the area	In first phase (year one) development of infrastructure completed	Infrastructure completed, project progress report Records of produce distributed among the community members, and	Active leadership of regional stakeholders. Qualified implementing partners are available to continuously support the

	Realistic, quantified expected results				
The overall objective of the project to enhance sustainable livelihoods through integrated farming system (i.e fruit, poultry and vegetable production) and strengthening the capacity on the existing livelihood sources (livestock production and rangeland management).					
Indicator	**Indicator**	**Baseline**	**Target**	**Source of verification**	**Risk & assumption**
				sales records. Household food consumption survey (baseline vs after intervention)	project Good community cohesion
Output 4.1.2: Number of hens and eggs produced contributing to nutrition and income	Records of production from poultry enterprise	There is little local poultry production, but not intensified with in integrated form	Production to be commenced in the phase of the project	Records of produce distributed among the community members, and sales records. Household food consumption survey (baseline vs after intervention)	Active leadership of regional stakeholders. Qualified implementing partners are available to continuously support the project Good community cohesion
Outcome 4.2: Improved income and nutrition from vegetables production	Records of production for vegetable enterprise	There is little local vegetables production, but not intensified with in integrated form	Production to be commenced in the phase of the project	Records of produce distributed among the community members, and sales records. Household food consumption survey (baseline vs after intervention)	Active leadership of regional stakeholders. Qualified implementing partners are available to continuously support the project Good community cohesion

	Realistic, quantified expected results				
The overall objective of the project to enhance sustainable livelihoods through integrated farming system (i.e fruit, poultry and vegetable production) and strengthening the capacity on the existing livelihood sources (livestock production and rangeland management).					
Indicator	**Indicator**	**Baseline**	**Target**	**Source of verification**	**Risk & assumption**
Output 4.2.1: planning and construction of crop and fruit production completed	Infrastructure for crop production installed and functioning	There is no well-developed crop production system in the area	In first phase (year one) development of infrastructure completed	Infrastructure completed, project progress report Records of produce distributed among the community members, and sales records. Household food consumption survey (baseline vs after intervention)	The water and soil suitable for the IFS; Active leadership of regional stakeholders. Qualified implementing partners are available to continuously support the project Good community cohesion
Outcome 4.2.2: Quantity of vegetables and fruit produced	Records of production	There is little or no crop production in the area	Production to be commenced in the second phase of the project	Records of produce distributed among the community members, and sales records. Household food consumption survey (baseline vs after intervention)	

	Realistic, quantified expected results				
The overall objective of the project to enhance sustainable livelihoods through integrated farming system (i.e fruit, poultry and vegetable production) and strengthening the capacity on the existing livelihood sources (livestock production and rangeland management).					
Indicator	**Indicator**	**Baseline**	**Target**	**Source of verification**	**Risk & assumption**
Outcome 5.1: Improved knowledge and skills of students around resilience to climate change threats on the existing farming system; and research produced related to IFS and climate change and adaptation.	Number of postgraduate students registered and completed	There is no student studying around IFS in the communities	In the third phase of the project phase completed	Copies of registered certificate of students	Sufficient students interested to study IFS
Output 5.1: Number of students trained on climate change threats and adaptation measures (that includes women and youth).	Report completed on time and students completed on time	There is no student studying around IFS in the communities	In the third phase of the project phase completed	Students registered for the programme with the specific project topic and copy of publication	Students completion on time and take responsibility to finish
Output 5.2: Number of students completing their research project work.	Report thesis completed on time and students completed on time	There is no student studying around IFS in the communities	In the third phase of the project phase completed	Students registered for the programme with the specific project topic and copy of publication	Students completion on time and take responsibility to finish

F. Demonstration of project alignment with adaptation fund the results framework

F. Demonstrate how the project/programme aligns with the results framework of the adaptation fund

Table 20: Project's objectives and outcomes aligned with the AF's outcome and output indicators

Project Objective(s)	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator
Objective 1: Enhance the level of understanding of the communities to facilitate and undertake diversified livelihood adaptation measures	Number of risk-exposed coastal communities protected through adaptation measures	**Outcome 3:** Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	2.2 No. of people with reduced risk to extreme weather events
Objective 2: design and implement production system and infrastructure for diversified livelihood options as adaptation measures	Number of communties with improved climate-related planning frameworks in the local communities	**Outcome 6:** Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas	6.1 Percentage of households and communities having more secure (increased) access to livelihood assets
Objective 3 & 4: Increase the resilience and food security of communities and households through appropriate application of value addition, capacity building and research for improved diversified livelihood and sustainable use of natural resources.	Number of communties and students improve insitutaional capcity to reduce risks asociated with climate induced socio-economic and enviromental lossess	**Outcome 2:** Strengthened institutional/local capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	2.1. No. and type of targeted institutions with increased capacity to minimize exposure to climate variability risks through value addition, training and research
Objective 4: Integrated farming system of poultry, fruit tree and garden designed and implemented production system and infrastructure for diversified livelihood	Percentage of communties with improved climate-related planning frameworks in the local communities	***Output 6:*** Targeted individual and community livelihood strategies strengthened in relation to climate	6.1.1.No. and type of adaptation assets (physical as well as knowledge) created in support of individual- or community-livelihood strategies

options as adaptation measures		change impacts, including variability	
Objective 5: Improved awareness of adaptation and climate change-related hazards affecting livelihood of the communities & increase interest to take up diversified livelihood sources	Percentage of population involved in developing improved cliamte-related planning frameworks	**Output 3**: Targeted population groups participating in adaptation and risk reduction awareness activities	3.1.1 No. and type of risk reduction actions or strategies introduced at local level

G. Detailed budget with budget notes

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

Table 21: Summary of Budget breakdown

Project Components	Expected Concrete Outputs	Expected Outcomes	Amount (USD)
Component – 1 & 3: Community mobilisation	Output 1.1:	Outcome 1:	55,800.00
Component – 2: Market research & value addition work	Output 2.2:	Outcome 2:	80,207.00
Component - 4: Production systems and infrastructure design	Output 2.1:	Outcome 2:	206,382.71
Component -5: Students involvement, capacity building & knowledge management	Output 4 1	Outcome 4	283,187.00
Programme Activities Cost (A)			**625,577**
Programme Execution cost (B)			**65,668**
Total Programme Cost (A + B)			**691,245**
Programme Cycle Management Fee charged by the Implementing Entity (C)			**58,756**
Amount of Financing Requested (A + B + C)			**750,001**

Table 22: Detailed budget breakdown

Component – 1 & 3: Community mobilization					
Activity -1 : wirkshop+ Trainings	No of training/workshop	days	No. part	cost/per	Total amount (USD)
Workshop					
Accommodation	2	4	30	30	7,200.00
Food	2	4	50	20	8,000.00
Venue					600.00
Final open public workshop	1	1	50	30	1,500.00
Stationary and workshop materail					500.00
Total Workshops	3				17,800.00
Training (3 days) on Poultry production	2	4	30	40	9,600.00
Training (3 days) on crop prodcution	2	4	30	40	9,600.00
Training (3 days) on Rangeland managenet	2	4	30	40	9,600.00
Training : WPC-Governance	2	4	20	40	6,400.00
Training materail + stationary					2,800.00
Total Cost for training & workshop	8				38,000.00
Total cost for mobilization + stakeholder meeting					55,800.00
Component – 2: Market research		No of partic	days	Rate	
Accommodation and meals (3stud + 2 suprisors)		5	40	120	24,000.00
Care hiring from outside					1,320.00
Total data collection cost					25,320.00

Reserved for value addition & marketing					54,887.00
Total market research and value addition					80,207.00
Component -4 : IFS					
Poultry infrastracture		unit	2.00	12,000.00	24,000.00
Activity 2.2.1: soil laboratory test		unit	2.00	600.00	1,200.00
Infrastracture costs for vegetable& fruit production component					
For Block (50mX50m) required 7role 4Blcok=1ha		unit	20.00	800.00	16,000.00
Saddlis (250 units)		unit	500.00	0.12	60.71
Pum (4KV =2liter per hour)		unit	8.00	95.21	761.71
Filter		unit	8.00	21.43	2,571.43
Fittings		unit	8.00	35.71	285.71
Axes and Handles (50 unit)		unit	200.00	21.43	4,285.71
Cutting machines (20 unit)		unit	100.00	142.86	14,285.71
Picks & Handles (50 unit)		unit	200.00	21.43	4,285.71
Spades (50 unit)		unit	150.00	10.71	1,607.14
Rakes (60 unit)		unit	180.00	14.29	2,571.43
Generator (1 unit)		unit	2.00	285.71	571.43
Land crusher (1 unit)		unit	2.00	23,948.00	47,896.00
Tractor (1unit)		unit	2.00	24,000.00	48,000.00
Fruit seedlings		unit	400.00	80.00	32,000.00
Labour cost for project					6,000.00
Total fixed cost (vegetable production component)					206,382.71
Component -5: Students involvement, capacity building & knowledge management					
Technical Advisor ,traval cost & field visit		Per month	300.00	500.00	150,000.00
Local transportation		km	36,000.00	0.60	21,600.00
Air ticket for South Africa parters+land transport +		unit	4.00	800.00	3,200.00

perdium					
Students pocket money (3students@$300 for three years)		unit	3.00	300.00	32,400.00
Other (Camping equipment)		tent	6.00	1,000.00	6,000.00
Computer equipment		labtop	4.00	1,000.00	4,000.00
Consumables - office supplies		Per month	90.00	180.00	6,200.00
Other services (tel/fax, electricity/heating, maintenance, project set up)		Per month	36.00	600.00	1,600.00
Project field staff		Per month	100.00	250.00	25,000.00
Publication & transulation		unit	4.00	800.00	3,187.00
Component-5					283,187.00
Total project cost		1			625,576.71
PROJECT/ EXECUTION COST (9.5% of 1)		2			65,668.00
TOTAL PROJECT COST(1+2)		3			691,244.71
PROJECT/PROGRAMME CYCLE MANAGEMENT FEE CHARGED BY THE IMPLEMENTING ENTITY (8.5% of 3)		4			58,756.00
AMOUNT OF FINANCING REQUESTED (3+4)		5			750,000.71

Table 23: Explanation and a breakdown of the execution costs

Cost note description
Component – 1 & 3: Community mobilization & Strengthen Traditional farming system
Workshops
Three workshops to be held during the project cycle
First workshop will be as inception workshop with the selected community members and possible stakeholders to clarify implementation modalities and again lessen from similar project implemented successfully somewhere else
Second workshop would be the midterm report workshop
Third workshop will be the final closer workshop and handover the project to the communities
Trainings
Eight different trainings that suit to the different components of the project
Two training (4days each) related to Strengthen Traditional farming system (range land farming) at different slot time
Two training (4 days each) related to poultry production at different stage of production level
Two training (4 days each) related to crop production at different stage of production level
Two training (4days each) related to WPC-Governance at different stage of production level
Component 2: Market research and value addition
Market research to be conducted by three students plus two supervisors of lead researchers for 20 days of each project site region, in total of 40 days data collection field work
Fund is also reserved once the market research conducted that inform possible market distribution and value addition intervention
Component 4: Implementation of IFS
Chicken House constructing for two communities based on the South African contractor it is estimated to be 12000 per site
Vegetable and fruit production and infrastructure estimated based on the small scale irrigation farmer around the area. Peter Kawana of Farm Schwarzfelde no 180, around Grootfontein farming with small irrigation and livestock, which going to be involved in this project as partner
Component 5: Knowledge Management and awareness raising
Three students cost would be $300 per students for 36month
Other costs
Project field staff will be 13 personnel per site. Two technical personal will be appointed to each site, in total four technical people (this covered by the community). 350 per month *13staff* *12monthnot included in the budget
100 man day field work per year 100day per year * $125 per day
Expected petrol Euro 0.60 per 1km covering 12000km on average per year, The rate of transport based on the Polytechnic standard of $0.6 per Km

Table 24: Projected Calendar

Milestones	Expected Completion
Start of programme (Inception workshop)	February 2016
Mid-point of programme implementation	
Mid-term evaluation report	
Programme completion	March 2019
Programme completion report	

Final evaluation report	
Final audited financial statement (IE grant account)	

Table 25: Fee and cost category

Fee Category	Cost category	Total (USD)
Management Fees	Project management, finance administration and office administration	124 424
Operating Expenditure	Travel, daily subsistence allowances and workshops associated with project oversight and governance	49 800
Office Services and Supplies	Utilities, telecommunications and office supplies	50 000
Auditing and consulting	External auditing, project evaluation and technical support	150 000
Total		**374 224**

H. Disbursement schedule

H. Include a disbursement schedule with time bound milestones

Table 26: Disbursement schedule

	Upon signature of agreement	End Year 1	End Year 2	Total (USD)
Scheduled Date	Nov 2015	Jan 2017	Jan 2018	
Project Funds	421,004	184,000	86,240	691,244
NIE Fee	16,190	18,659	23,907	58,756
Total Financing (A+B+C)	**437,194**	**202,659**	**110,147**	**750,000**

Table 27: Projected calendar

Milestones	Expected Completion
Start of programme (Inception workshop)	January 2016
Mid-term evaluation (if required)	September 2017
Programme closing	June 2019
Terminal evaluation	April 2019

1. References

Barnard, P. (ed.) (1998). Biological diversity in Namibia: a country study. Windhoek: Namibian National Biodiversity Task Force. 332 pp.

Brown, C.J. (ed.) no date. Namibia‘s Green Plan: Environment and Development. Republic of Namibia, Draft. Windhoek.

Cheng Y, Ni Fuquan, Lu Xiuyuan, Yang M (2013). Research on the Practical Teaching System of Agricultural Water Conservancy Engineering Talents Cultivation International Conference on Education Technology and Information System (ICETIS 2013)

De Klerk, J.N. 2004. Bush encroachment in Namibia: report on Phase 1 of the Bush Encroachment Research, Monitoring and Management Project. Ministry of Environment and Tourism, Government of the Republic of Namibia. John Meinert Printing, Windhoek, Namibia.Government of Namibia.(2002). Initial National Communication to the United Framework Convention on Climate Change. July 2002. Available at http://unfccc.int/resource/docs/natc/namnc1.pdf.

Dealie, F.F., S.A. Hamata, J.R. Kambatuku, M. Molapo, L.G. Parenzee, and F.W. Soroses.(1993). Rainfall in Namibia. What is normal? Desert Research Foundation of Namibia, Windhoek, Namibia.

FAO (2012). SOIL CONSERVATION ACT 76 OF 1969 http://faolex.fao.org/docs/pdf/nam126829.pdf

Hudson, D. A. and R. G. Jones (2002) Regional climate model simulations of present day and future climates of Southern Africa. Hadley Centre, Bracknell, Technical Note 39.

IPCC.(2001). Impacts, Adaptation, and Vulnerability.Intergovernmental Panel on Climate Change.Cambridge University Press, Cambridge, UK.

Köhler, O. (1959). A study of Gobabis district (South West Africa).Department of Bantu Administration and Development.Ethnological Publications No. 42. The Government Printer, Pretoria. South Africa.

Legal Assitance Centre (2002). Government gazette of the republic of Namibia Windhoek - 12 August 2002 No.2787 http://www.lac.org.na/laws/pdf/communallandreformact.pdf

Legal Assitance Centre (2007). GOVERNMENT GAZETTE oF THE REPUBLIC OF NAMIBIA, WINDHOEK - 27 December 2007 No. 3966 http://www.lac.org.na/laws/2007/3966.pdf

Mendelsohn, J., A. Jarvis, C. Roberts, and T. Robertson. (2002). Atlas of Namibia: a portrait of the land and its people. David Publishers, Cape Town, South Africa.

Midgley, G., G. Hughes, W. Thuiller, G. Drew and W. Foden.(2005). Assessment of Potential Climate Change Impacts on Namibia‘s Floristic Diversity, Ecosystem Structure and Function.

Ministry of Agriculture, Water and Forestry (2004). GOVERNMENT GAZETTE OF THE REPUBLIC OF NAMIBIA WINDHOEK - 23 December 2004 No.3357 http://www.mawf.gov.na/Documents/Gaz-3357.pdf

Ministry of Agriculture, Water and Forestry (2004). GOVERNMENT NOTICE.No. 284. Promulgation of *Water Resources Management* Act, *2004* **(***Act No*. 24 of.*2004***),** http://www.mawf.gov.na/Documents/Gaz-3357.pdf

Ministry of Agriculture, Water and Forestry (2009). Agricultural statistics Bulletin: Directorate of planning

Minstry of Envoroment and Toursim (2001). GOVERNMENT GAZETTE OF THE REPUBLIC OF NAMIBIA WINDHOEK - 21 December 2001 No.2667 http://www.met.gov.na/Documents/Forestry%20Act.pdf

Namibia's Programme to Combat Desertification (Napcod)(2003). First national report on implementation of the United Nations convention to combat desertification.www.unccd-prais.com/.../1ed4e478-f24d-475c-b962-a0fa014a4a65

Quan, J., Barton, D. and Conroy, C. (1994). A preliminary assessment of the economic impact of desertification in Namibia.DEA Research Discussion Paper no. 3.Ministry of Environment and Tourism, Windhoek. Namibia.

Rauch T, Bartels M, Engel A (2001). Regional Rural Development: A regional response to rural poverty. Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH

Reid, H., Sahlen, L., MacGregor, J., and Stage, J. (2007). The economic impact of climate change in Namibia: How climate change will affect the contribution of Namibia's natural resources to its economy. Environmental Economics Programme.Discussion Paper 07-02.International Institute for Environment and Development. November 2007.

South African National Botanical Institute, Cape Town.

The Environmental Health Research Network (EHRN) (2015). HEALTH ACT NO. 63 OF 1977http://www.ehrn.co.za/download/act_health.pdf

World Health Organisation. (2013). Namibia Country cooperation strategy: at a glance. Available at http://www.who.int/countryfocus