

**United Nations Development Programme**

**Country: BENIN**  
**PROJECT DOCUMENT<sup>1</sup>**



**Project Title:** Integrated Adaptation Programme to Combat the adverse Effects of Climate Change on Agricultural Production and Food Security in Benin

**UNDAF Outcome(s):**

UNDAF Outcome 1: By 2013, marginalized populations i.e. young people and women, benefit from employment opportunities and income generating activities leading to increased food security.

**UNDP Strategic Plan Environment and Sustainable Development Primary Outcome:** see Annex 2

**Key Results Area:** Promote climate change adaptation

**Provisional Corporate Outcome 1.** Strengthened capacity of developing countries to mainstream climate change adaptation policies into national development plans.

**UNDP Strategic Plan Secondary Outcome:** see Annex 2

**Key Results Area:** Expanding access to environmental and energy services for the poor.

**Provisional Corporate Outcome 2.** Strengthened capacity of local institutions to manage the environment and expand environment and energy services, especially to the poor.

**Expected CP Outcome(s):**

*(Those linked to the project and extracted from the country programme document)*

**Expected CPAP Output (s)**

1. The capacities of national structures and local communities are developed in terms of environmental preservation.
2. In response to climate change impacts, adaptation strategies and measures are developed and implemented in the most vulnerable zones.

**Executing Entity/Implementing Partner:** MEPN, Ministry of Environment and Nature Protection

**Implementing Entity/Responsible Partners:** UNDP

<sup>1</sup> For UNDP supported GEF funded projects as this includes GEF-specific requirements



### Brief Description

Republic of Benin is at risk to climate change, and that all natural resource-based productive sectors, including agriculture, fisheries, breeding, water resources, forestry, and overall food security are already adversely affected by climate change.

Whilst adaptation to climate change has been identified as one key priority to prevent crises and catastrophes by Government at the national level, the capacities to induce and strengthen adaptation at the decentralised government level are relatively limited. Communes and decentralised line Ministries have limited knowledge of climate change risks, adaptation needs and options, and individual, institutional and systemic capacities to act on such risks remain low. Although a great deal of endogenous coping mechanisms already exists, more systematic adaptive planning is not currently taking place and local communities are not yet fully engaged in desperately needed adaptation action.

The proposed initiative aims to strengthen capacities of agricultural communities to adapt to climate change in four vulnerable agro-ecological zones in Benin. Through Outcome 1, the initiative will contribute to developing a climate change resilient planning framework for the focal sectors in Benin, ensuring that commune and national development plans, sectoral policies and associated budgets incorporate adaptation needs. The technical and scientific capacity to provide critical decision-making support information will be strengthened. Through Outcome 2 the necessary enabling and support environment for communities to be empowered to adapt to adverse climatic conditions will be strengthened. Commune level governance structures' capacities to facilitate and catalyse anticipatory local community action on adaptation will be improved. Dedicated community-level project interventions will be piloted in four out of nine agro-ecological zones, developing and testing specific distinct production systems associated with each of these zones that is more likely to succeed under conditions of climate change. Outcome 3 focuses on promoting sharing of adaptation learning within Benin and internationally.

Overall climate change resilient food security will be achieved in these pilot communities, and the overall governance framework concerning agriculture and food security will become climate resilient.

The initiative will be led by the Ministry of Environment and Nature Protection (MEPN), with support from UNDP and other partners, as per the NEX arrangements.

Programme Period:	2009 – 2014
Atlas Award ID:	00059395 (BEN10)
Project ID:	00074252 (BEN10)
PIMS #	4047
Start date:	January 2010
End Date	December 2014
Management Arrangements	NEX
PAC Meeting Date	13 Oct 2009

Total resources required	
Total allocated resources:	11,310,000
• Regular (GEF/LDCF)	3,410,000
• Other:	
o Government(MEPN)	850,000
o Government (in-kind)	4,114,381
o Communes (cash)	341,000
o Communes (in-kind)	2,094,619
o Undp (cash)	500,000

Agreed by (Government):

Date/Month/Year

Agreed by (Executing Entity/Implementing Partner):

Date/Month/Year

Agreed by (UNDP):

Date/Month/Year



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## List of Acronyms

ALM	Adaptation Learning Mechanism
ASECNA	Ministry of Transport, Aviation Section
C/SPRN	Chef Service Protection des Ressources Naturelles
CCA	Climate Change Adaptation
CENATEL	Centre National de Teledetection
CPAP	Country Programme Action Plan
DDEPN	Direction Départementale de l'Environnement et de la Protection de la Nature
DGEau	Directorate of Water Management
DGEnv	Directorate of Environment
DICAF	Council for Agriculture and Training
DPP	Directorate of Development Planning
EWS	Early Warning System
FSP	Full-Size Project
GEF	Global Environment Facility
GTA	Agro-meteorological Technical Group
GTZA	Zonal Agro-meteorological Technical Groups
INC	Initial National Communication
INRAB	Institut National de Recherche Agricole du Bénin
ITCZ	Inter-Tropical Convergence Zone
LDCF	Least Developed Countries Fund
LSSEE	Laboratoire des Sciences du Sol et de l'Eau
MAEP	Ministry of Agriculture, Animal Husbandry and Fisheries
MDG	Millennium Development Goals
MEPN	Ministry of Environment and Nature Conservation
NAPA	National Action Programme of Adaptation
NAP/DC	National Action Programme/ Desertification Control
NGO	Non-governmental Organisation
NGSPR	???
PDC	Commune development plans
PPG	Project Preparatory Grant
PRSP	Poverty Reduction Strategy Paper
PTAs	Annual Work Plans
PTC	Project Technical Committee
RCPA	Responsables Communaux de Production Agricole
SCRIP	Stratégie de Croissance pour la Réduction de la Pauvreté
UNCCD	United Nations Convention to Combat Desertification
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change



## List of Annexes

**Annex 1:** Risk Log

**Annex 2:** Terms of Reference for Key Personnel

**Annex 3:** Capacity Assessment of Implementing Partner (MEPN)

**Annex 4:** Descriptions of Agro-ecological Zone and Pilot Communes and draft element for Village Adaptation Programmes

**Annex 5:** Summary of Training Needs and Capacity Assessment

**Annex 6:** Draft design elements for agro-meteorological information system

**Annex 9:** Stakeholder Consultation Protocols

**Annex 8:** References including to key assessment reports

**Annex 9:** Agreements (Co-financing letters)



## 1. Situation analysis

### Context

1. In line with guidance and eligibility criteria for the Least Developed Countries Fund (LDCF), managed by the Global Environment Facility (GEF/C.28/18, 12 May 2006), this proposal seeks LDCF funding for a Full-Size Project (FSP) in Benin to implement adaptation priorities identified in the National Adaptation Programme of Action. Benin completed its NAPA in January 2008. The proposed project is in line with country priorities on improving food security and agricultural productivity especially in light of difficult climate conditions, as specified in the second Poverty Reduction Strategy Paper (PRSP) and NGSPR, and directly addressed in Outcome 1 of the UNDAF 2009-2013. The NAPA (2008), as well as the Initial National Communication (INC; 2002) have concluded that Benin is at risk to climate change, and that all natural resource-based productive sectors, including agriculture, fisheries, water resources, forestry, and overall food security will be adversely affected by climate change.

2. Whilst adaptation to climate change has been identified as one key priority to prevent crises and catastrophes at the national and sub-national level, the capacities to induce and strengthen adaptation at the decentralised government level are relatively limited. Communes and decentralised line Ministries have limited knowledge of climate change risks, adaptation needs and options, and individual, institutional and systemic capacities to act on such risks remain low. Although a great deal of endogenous coping mechanisms already exists, more systematic adaptive planning is not currently taking place and local communities are not yet fully engaged in desperately needed adaptation action.

3. The proposed initiative aims to strengthen capacities of agricultural communities to adapt to climate change in four vulnerable agro-ecological zones in Benin. It aims to create the necessary enabling and support environment for communities to be empowered to adapt to adverse climatic conditions. Focusing on the agricultural sector (defined based on stakeholder consultations to include cropping, animal husbandry as well as inland fisheries) and the improvement of food security, relevant national, regional and commune level governance structures will be targeted through the project design and their capacity to facilitate and catalyse local community action on adaptation will be improved. Dedicated community-level interventions will be piloted in four out of nine agro-ecological zones in Benin, developing and testing specific distinct production systems associated with each of these zones. Overall, this initiative will contribute towards the achievement of climate change resilient food security in these pilot communities as well as strengthening the overall governance framework concerning agriculture and food security under conditions of climate change.

4. The nine agro-ecological zones distinguished in Benin are: Zone 1: Extreme North (Zone extreme Nord-Benin), Zone 2: Cotton zone of northern Benin (Zone cotonniere du Nord-Benin), Zone 3: Food producing zone of South Borgou (Zone vivriere du Sud-Borgou), Zone 4: West Atacora (Zone Ouest-Atacora), Zone 5: Central cotton zone (Zone cotonniere du Centre-Benin), Zone 6: Bare soils (Zone des terres barres), Zone 7: Depression (Zone de la depression), Zone 8: Fisheries zone (Zone de pecherie). A Vulnerability Assessment<sup>2</sup> conducted in 2006 identified Zones 1, 4, 5 and 8 (see Figure 1) as particularly vulnerable to climate change (see Annex 4 for more detailed background). The NAPA (2008) confirmed this identification and prioritizes the four agro-ecological zones for urgent adaptation action. Consequently this LDCF project focuses its interventions in these four zones.

5. Based on a specific risk study<sup>3</sup> nine pilot communes have been identified during the PPG phase as particularly at risk of climate change, and they were confirmed in a participatory manner as focal partners for the LDCF project implementation, namely: Malanville (Zone 1: Extreme North), Ouake and Materi (Zone 4: West Atacora and Nord Donga), Savalou and Aplahoue (Zone 5: Central Cotton Zone) and Bopa, Quinhi, Adjohoun and So Ava (Zone 8: Fisheries Zone).

<sup>2</sup> Aho, P.N., 2006. Evaluation concrete de la vulnerabilite aux variations actuelles du climat et aux phenomenes meteorologiques extremes. Republique du Benin, Programme D'Action National Aux Fins de L'Adaptation Aux Changement Climatiques (PANA), Cotonou, Benin

<sup>3</sup> MEPN - PPG 4, 2009. Evaluation statistique et cartographique des risques climatiques dans les zones agro-ecologiques couvertes par le projet PANA 1. MEPN, Programme Integre d'Adaptation aux Changements Climatiques dans le secteur de l'Agriculture pour la Securite Alimentaire du Benin, Cotonou, Benin



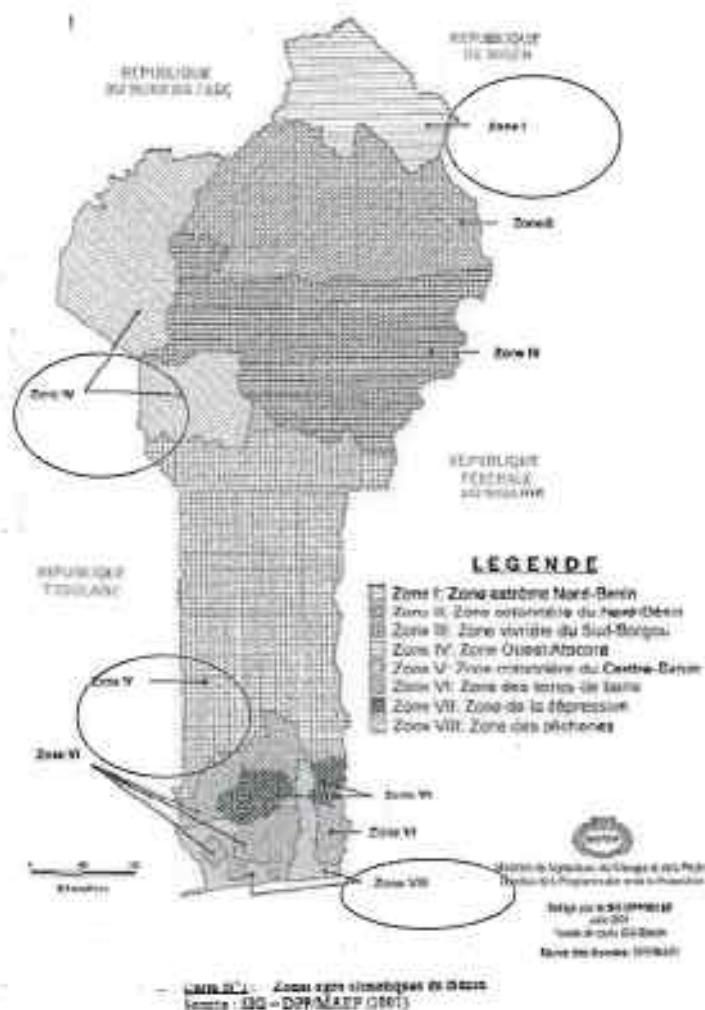


Figure 1: Map of the nine agro-ecological zones distinguished in Benin. A Vulnerability Assessment conducted in 2006 and the NAPA (2008) identified Zones 1, 4, 5 and 8 as particularly vulnerable to climate change (see red circles). Pilot communes in these four agro-ecological zones have been selected for the LDCF project.

## 1.1. Climate change - induced problem

### Current climate<sup>4</sup>

6. Benin is located in West Africa on the Guinea Coast. At latitudes of 6-13°N and longitude 1°40', the climate of Benin is generally tropical, and strongly influenced by the West African Monsoon. The rainfall seasons of Benin are controlled by the Inter-Tropical Convergence Zone, ITCZ. In northern Benin, there is a single wet season occurring between May and November, and a dry season between December and March when the 'Harmattan' wind blows north-easterly. The northern and central regions receive 200-300mm per month in the peak months of the wet season (July to September). The southern regions of Benin have two wet seasons and two dry seasons, one in March to July, and a shorter wet season in September to November, corresponding to the northern and southern passages of the ITCZ across the

<sup>4</sup> After McSweeney, C., New, M. and Lizcano, G., 2008. Country Profile Benin. <http://country-profiles.geog.ox.ac.uk>



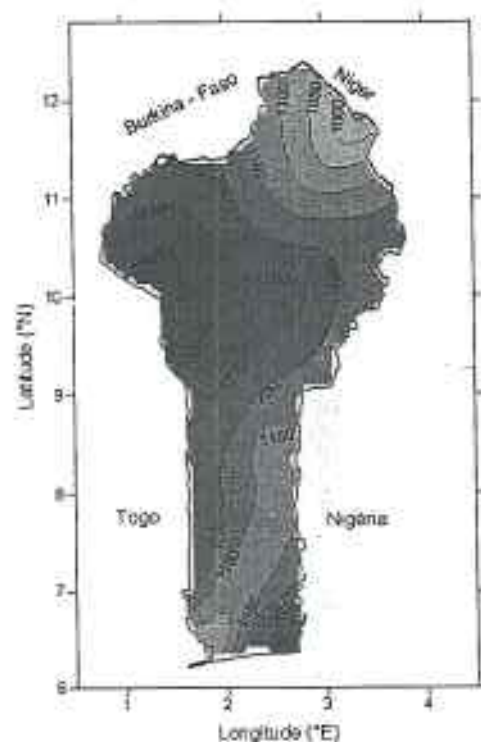
region. The seasonal rainfall in this region varies considerably on inter-annual and inter-decadal timescales.

#### Recent climate trends

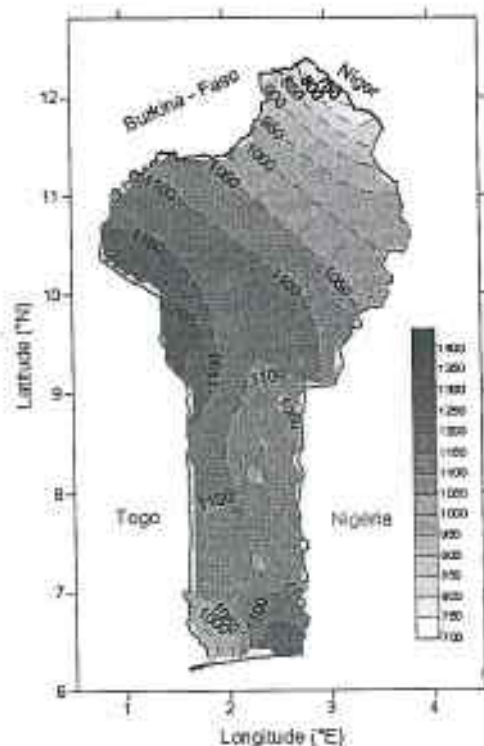
7. Climate trends indicate that the mean annual temperature has increased by 1.1°C since 1960. The rate of increase has been most rapid in the months of April, May and June. Daily temperature data indicate that the frequency of 'hot' days has increased significantly in all seasons except December to February, and that the frequency of 'hot' nights has increased significantly in all seasons. The frequency of 'cold' days and nights, annually, has decreased significantly since 1960.

8. Annual rainfall in Benin is highly variable on inter-annual and inter-decadal timescales and as in most other parts of the world, it is difficult to establish long term trend. A climate risk study commissioned by MEPN (2009)<sup>6</sup> reports decline in rainfall between the periods of 1940-1970 and 1971-2003 Figure 1 a & b).

a) Period 1940 – 1970



b) Period 1971-2007



**Figure 1: Annual average rainfall across Benin (MEPN, 2009)**

#### Climate change projections

12. In terms of anticipated long-term climate change, the mean annual temperature is projected to increase by 1.0 to 3.0°C by the 2060s, and 1.5 to 5.1°C by the 2090s<sup>7</sup>. The projected rate of warming is

<sup>6</sup> MEPN – PPG 4, 2009

<sup>7</sup> McSweeney, C. et al., 2006

<sup>7</sup> McSweeney, C. et al., 2008



more rapid in the northern inland regions of Benin than the coastal regions. Projections indicate substantial increases in the frequency of days and nights that are considered 'hot' and decreases in the frequency of days and nights that are considered 'cold' relative to current climate. Precipitation projections indicate a wide range of changes in precipitation for Benin, covering a similar range of increases as decreases. Seasonally, the projections tend towards decreases during January to June, and increases in July to December. The proportion of total annual rainfall that falls during extreme precipitation events tends towards an increase.

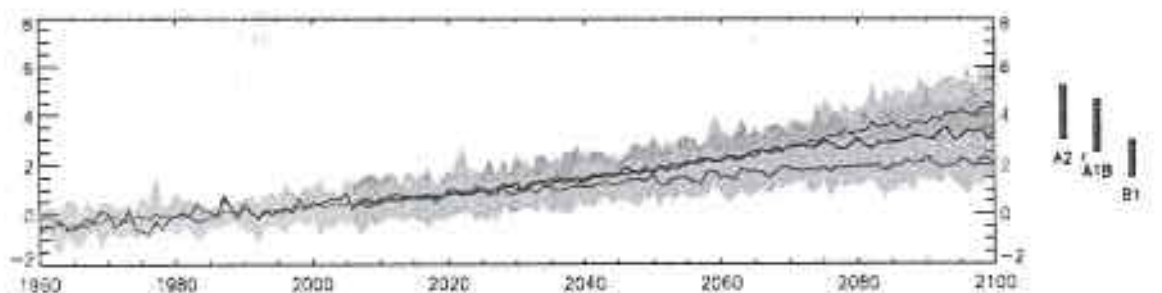


Figure 2: Anomalies in annual temperature for Benin up to the end of the century (McSweeney et al., 2008)

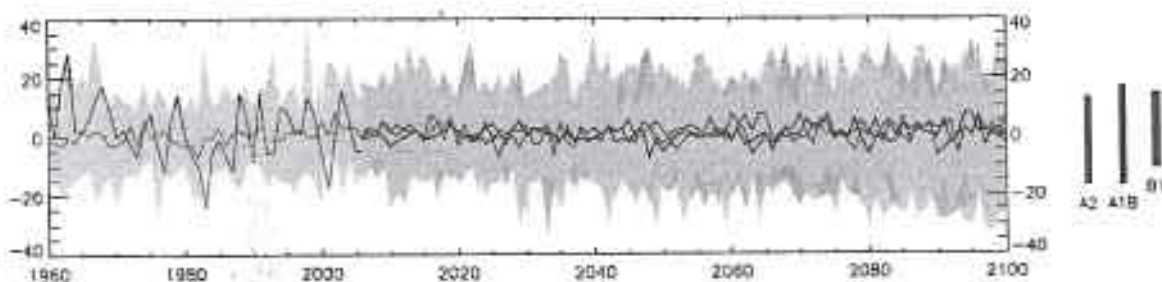


Figure 3: Anomalies in annual rainfall in Benin up to the end of the century (McSweeney et al., 2008)

#### *Climate change risk and expected impacts in the selected agro-ecological regions*

13. During the PPG phase observed climate trends based on locally available data were analysed for the four agro-ecological zones covered by the project interventions<sup>9</sup>. A classification of each climate change risk into four categories impact (i) low, (ii) medium, (iii) fairly high and (iv) high was used. Risks considered were (i) dry spells/drought, (ii) strong winds, (iii) late and extreme rainfall, (iv) flooding, and (v) extreme heat.

14. Overall the observed and in the future expected climate change risks and impacts are more moderate in the coastal areas compared to the northern areas of the country (see Figures 1 to 5<sup>10</sup>). Zone 1 is the most vulnerable with strong impacts expected of each risk, whilst zone 4 is vulnerable at a medium level to extreme heat, floods and late and extreme rainfall. Levels are fairly high for drought and strong winds. Zone 5 is at medium risk for extreme heat, flooding, drought, fairly high risk for late and extreme rainfall, and at high risk for extreme winds. Zone 8<sup>10</sup> is at low risk of drought and extreme heat, medium for strong winds and late and extreme rainfall, and high for flooding.

<sup>9</sup> MEPN- PPG 4, 2009

<sup>9</sup> MEPN – PPG 4, 2009

<sup>10</sup> The seaward sections of Zone 8 are extremely vulnerable to sea-level rise. However, all of the selected project pilot



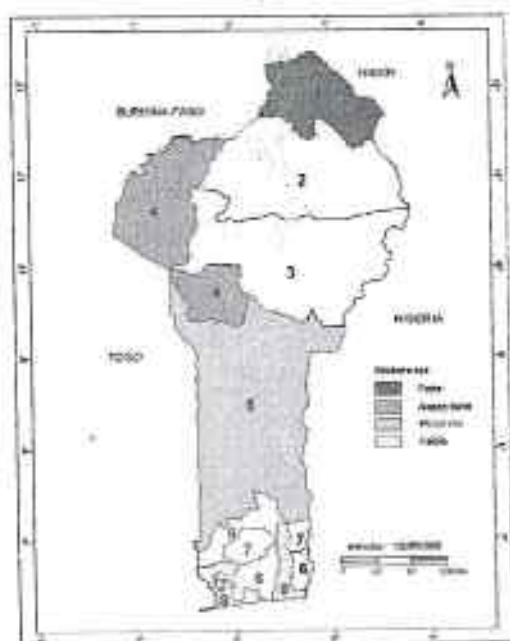


Figure 1: Map of the relative drought risk compared amongst the four agro-ecological zones

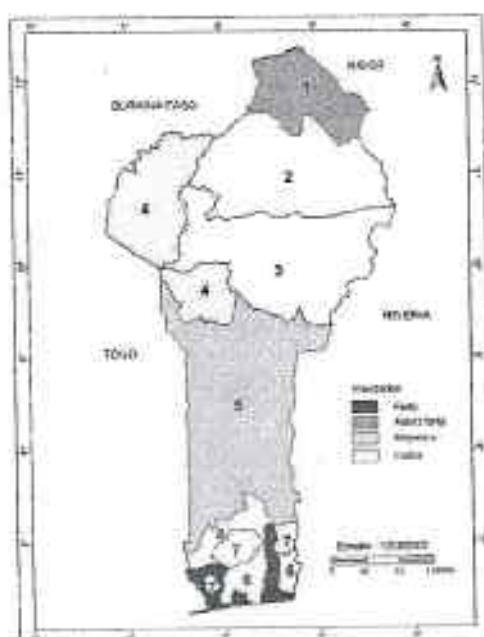
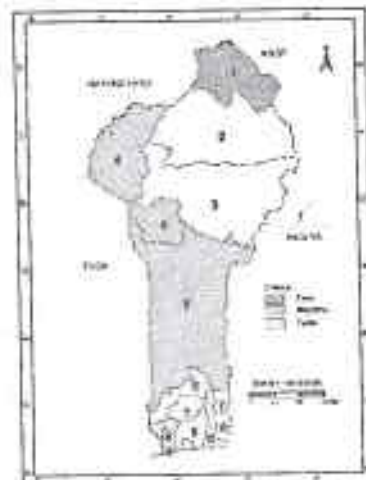
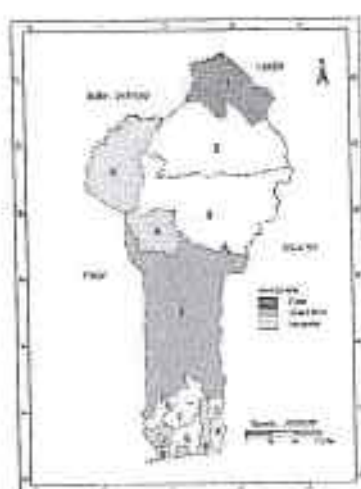
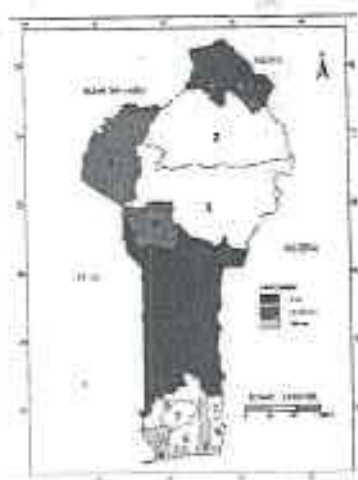


Figure 2: Map of the relative flood risk compared amongst the four agro-ecological zones



Figures 3 to 5. Maps of the relative risks of (i) strong winds, (ii) heavy rainfall events and (iii) increased temperatures compared amongst the four agro-ecological zones

15. According to the risk study, the expected climate change risks will have – and already have – pronounced impacts on food production in the four zones. In Zone 1, where maize, sorghum and rice are produced as major food crops, complemented by the tubers manioc and igname, maize and sorghum<sup>11</sup> are extremely vulnerable to changed rainfall patterns, drought and especially heavy rainfall and flooding

areas are situated inland and cover inland fisheries only.

<sup>11</sup> Corroborated also by production data from the 1970's for selected crops in the NAPA (2008). Maize and Sorghum were extremely vulnerable to drought and extreme rainfall.



after prolonged dry spells. Late and extreme rainfall leads to a destruction of planted materials before maturation. Considering the compounded climate impacts, rice is considered the least vulnerable of the three crops, and manioc performs better than igname. Potatoes, onions and periperi which are grown for trade seem to be less affected as they are often cultivated under irrigation<sup>12</sup>. The climate change impacts in Zone 4 are similar to those in Zone 1, mainly as similar food crops are being produced, however overall the impacts are of a lower scale. Food productivity is reduced especially in extreme drought years, when food insecurity can be a direct effect (NAPA, 2008). In Zone 5 the wind impact leads to the destruction of the standing crops, often before maturity. Maize, sorghum, millet and pearl millet are destroyed before maturation and entire harvests are wiped out by extreme wind events. No specific impacts are reported for zone 8 in risk study<sup>13</sup>, however from consultations<sup>14</sup> in that zone it was reported that agricultural productivity declined due to a change in rainfall patterns and shifts in the onset of the planting season.

16. In 2007 and 2009, large part of Benin were affected by major floods, which not only destroyed infrastructure but rendered most of the annual harvest as spoiled – rotting food crops, invasion of pests, physical destruction of fields. The lake system in southern Benin was affected by high water levels, inundating areas traditionally used for seasonal cultivation. Further fish stocks have been said to be negatively affected due to a change of temperature, siltation and a fluctuation of salt levels in the water.

17. Impacts on livestock production have been reported in the NAPA (2008) and during consultations in the PPG phase<sup>15</sup> with grazing availability being a problem during drought years. Pastoralists have to move further with their animals to find appropriate grazing, often leading to land use conflicts with local farmers. Additionally, water stress and high temperatures pose health risks leading to poor productivity.

18. In northern Benin more frequent dry spells and prolonged droughts are experienced, and throughout the country farmers express that seasonality has greatly changed from what was previously known, leaving them unable to respond with appropriate timing of seeding and planting, and cultivars that are not adapted to the seasonal patterns. The traditional farming calendars do not apply anymore and it is difficult for the farmers to adjust their farming practices effectively.

19. All the described climate change impacts threaten food security, but also pose income losses to rural people in Benin. The NAPA (2008) projects that although Benin is generally considered to be food self-sufficient, the projected climate change impacts can lead to food insecurity if unattended.

## 1.2. Root causes

20. The West African country of Benin covers a land surface of 114,763 km<sup>2</sup>, and borders Nigeria, Niger, Burkina Faso and Togo. It also has an Atlantic coastline of about 125 km. The overall population size was about 8 Million in 2007 (UNDP, 2007), and the annual growth rate is estimated at 3.25% per annum. The majority of Benin's 8 million people live in the south, and other areas of the country are not very densely populated. After a major political change in 1991, Benin has made some significant development progress especially in macro-economic terms. However, in global Human Development Index rankings, Benin ranks at number 163 out of 177 countries (HDI 0.437), and has an absolute poverty rate of around 37.4% (UNDAF, 2009)<sup>16</sup>. Major development challenges prevail, and progress towards

<sup>12</sup> At this stage no research information on the impact of climate change on water availability is available for Benin, but a regional study conducted by ACMAD foresees negative water balances in the future. PRESAO, Prevision Saisonniere en Afrique de L'Ouest de L'ACMAD; cross-referenced in NAPA 2008. A GTZ funded CCA pilot project in Benin established that ground water levels were declining in Benin (potentially exacerbated by CC) and harvest yields for rice dropped by up to 50% because of water shortages.

<sup>13</sup> MEPN – PPG 4, 2009

<sup>14</sup> MEPN – PPG 1, 2009. Rapport d'Investigation Sur Les Mesures Prioritaires d'Adaptation Aupres Des Populations Des Zones Agro-ecologique Du Projet. MEPN, Programme Integre d'Adaptation aux Changements Climatiques dans le secteur de l'Agriculture pour la Sécurité Alimentaire du Bénin, Cotonou, Benin

<sup>15</sup> MEPN – PPG 1, 2009.

<sup>16</sup> This figure compares with a data for 2002, which classified only 28.5% of people living below the poverty line (PRSP), i.e. there is a worsening trend in poverty levels prevailing in Benin.



achieving the 2015 Millennium Development Goals (MDG) is very slow. It is believed that major MDG targets in terms of education, health, water supply and poverty reduction will not be met in Benin.

21. About 61% of Benin's land area are used for agricultural production (including animal husbandry), and agriculture employs approximately 70% of the active population. The sector contributes to 36% of the GDP and 88% of export earnings<sup>17</sup>. Around 70 000 small scale fishermen are believed to make a living from fishing, including marine and inland fisheries.

22. Food crop production largely consists of grain on nearly 1.1 Million hectares of which 54% are devoted to maize. Maize is considered the most profitable grain, however vulnerabilities e.g. to changing climate conditions have been reported. Rice has become a strategic crop with growing importance in the national consumption pattern and trade between neighbouring countries (i.e. Niger, Nigeria and Togo). Although its level of production is increasing (from 16 045 tons in 1995 to 73 000 in 2005), there are significant imports (over 450 000 tons in 2004 and approximately 378 000 in 2005) to complement internal and re-exportation needs (CIPB, 2007). As for root and tuber crops, cassava has taken on significance as a food crop for the people accounting for 54% of the national production of roots and tubers.

23. The fishery sub-sector accounts for the livelihood of over 70 000 people (including both, marine and inland fisheries) and accounts for 2% of the country's GDP. During the period 1998 to 2005, production stagnated around 40 000 tons per year and the importation of frozen fish increased from 20 000 tons in 2001 to 45 000 tons in 2005.

24. The livestock sub-sector accounts for approximately 6% of the GDP. It is marked by traditional husbandry practices of cattle, goats, pigs and poultry. Existing livestock and animal numbers are considered insufficient to cover the country's needs in animal protein, particularly in meat, milk and eggs. The present level of imported frozen meat (8 800 tons in 2005) means that Benin is highly dependent on imports (CIPB, 2007).

25. Overall the agriculture, livestock production and fisheries sectors are regarded as unproductive with low adaptive capacities for reasons linked to structural factors (high population pressure, high level of poverty among rural populations, weak mechanization and intensification of production modes, limited investment capacities), but also because of natural constraints (poor soils, difficult climatic conditions) and capacity constraints (poor management of water, soils and other natural resources, leading to natural resource degradation). More specifically key factors driving Benin's poor agricultural and inland fisheries performance are the prevailing high levels of poverty and dependence on subsistence agriculture and fisheries; low levels of investment into sector development, limited market development and access for agricultural products, limited outreach capacities to community level, limited access to agricultural inputs such as organic fertilizers, improved seeding and breeding materials, and land and natural resource degradation.

#### *High levels of poverty, population pressure and dependence on subsistence agriculture*

26. Benin is one of the poorest countries in Africa (see para 20 above), with her economy dependent on an agriculture that is largely undeveloped, and reliant on subsistence farming and some regional trade. About two-thirds of the work force in Benin is engaged in agriculture, mainly subsistence farming. Very limited investment capacity exists amongst subsistence farmers, which hampers the application of improved farming practices that would generate higher production returns. Knowledge about improved land management practices is often lacking, and levels of innovation are extremely low. The current ways of land management generate low returns from the land.

<sup>17</sup> Essentially linked to cash crops such as cotton, the only cash crop suited to small scale farmers, making up 40 per cent of the country's GDP and over 80 per cent of export revenues. The country's fertile land has suffered environmental degradation as a result of the emphasis on production of cotton for export, and because 90 per cent of all pesticides are used on cotton.

(See FAO country profile Benin <http://www.fao.org/ag/AGP/AGPC/doc/Counprof/Benin/Benin.htm>)



27. Although total food production has steadily increased in Benin<sup>18</sup> over the past decades, per capita food production has decreased. The growing population pressure is exacerbating this effect, placing ever growing pressures onto the production sectors.

*Low levels of investment into sector development, including limited market development and access for agricultural products*

28. The Government of Benin is injecting too little resources into developing the agricultural and food security sectors. There are marked production deficits which make Benin a net importer of foodstuff (although it is asserted that Benin could be food self sufficient). It has been reported that the Government of Benin is aiming to expand its rice production to reduce the observed rice deficit and to produce for regional markets; however major investments into the crop development are needed. There needs such as for research, dissemination of rice cultivars, capacity support in production for small scale farmers, as well as market development, that need to be invested in to develop such a grain as a major food and cash crop.

29. Other resources, such as inland waters resources are currently not systematically developed and exploited. Aquaculture and the halieutic production, for example, are still underdeveloped. The raising of non-conventional species (e.g. snails, grass-cutters/bush rats, rabbits) is being increasingly developed, however at relatively low rates. Limited investments have been made into the research and promotion of climate resistant crops and cultivars of other food plants and animals. Areas that are considered to be of high fertility, especially along the Niger river (said to be the second most fertile river area aside the Nile river), are not being developed systematically for agricultural production, currently.

30. Overall it has been observed that in the past years there has been no appreciable improvement in the quality of products due to lack of consecutive infrastructural development to facilitate access to markets (CIPB, 2007). The development of new products would require further dedicated inputs into the development of infrastructure and markets.

*Limited outreach capacities to community level*

31. Given the low capacities of local communities it is evident that dedicated outside support and investment would be needed to mobilize local level capacities. The Government of Benin has established a decentralised governance system in 1999 and commune (district) level governance systems are now in place, supplemented by deconcentrated specialist support services by various line ministries (i.e. MEPN and MAEP). However, the budgets available to these structures are extremely low and consequently outreach activities are limited.

*Limited access to agricultural inputs such as fertilizer, improved seeding and breeding materials*

32. Linked to the overall limited investment capacities of poor farmers and a relatively poor government, limit the investments into farm implements that would increase productivity. Although fertilizer use intensity (kg per hectare cropland) has increased to 31 kg in 2000 from virtually zero inputs before 1990<sup>19</sup>. Although no quantitative figures are available on the availability and accessibility of seeding materials and improved cultivars, this was voiced as one of the most pertinent needs by local farmers, fishermen and extension officers during consultations. The absence of access to such implements is considered one of major root causes hindering agricultural and fisheries development in Benin by these stakeholders.

*Land and natural resource degradation*

<sup>18</sup> WRI, 2009. Earth Trends country profiles: Agriculture and Food security <http://earthtrends.wri.org>, accessed 06 October 2009.

<sup>19</sup> WRI, 2009.



33. According to Benin's National Action Plan for Desertification Control (NAP/DC; 2000) under the UN Convention to Combat Desertification (UNCCD), large areas of Benin are degraded. Amongst the key manifestations of land degradation are soil erosion, loss of soil fertility and deforestation. Soil erosion and loss of fertility are attributed to poor land management practices including poorly managed and constrained transhumance, overgrazing, and slash and burn practices that destroy the natural resource base. The non-rehabilitation of areas that were previously used for cash crops i.e. cotton led to soil degradation. Deforestation is a major environmental issue, with needs for firewood and timber continuously increasing due to population growth and to the development of economic activities. Traditional practices e.g. applied in inland fishing are depending on large amounts of woody resources for building "traps", further exacerbate the deforestation problem. Water resource degradation is another major issue in Benin. Large scale deforestation is believed to have destroyed major ecosystem services especially related to water retention and conservation, leading to the degradation of ground water sources in many parts of the country. Worsened by poor water management practices, water resources are severely degraded in parts of the country.

34. Overall it is asserted that the growing population, with increasing poverty levels is increasingly depending on natural resources. Such resources are already over utilised and often degraded. Ecosystem resilience is low, and the additional climate change challenges cannot easily be buffered by the degraded ecosystems (NAPA, 2008).

### 1.3. Long-term solution and barriers to achieving the solution

35. In light of the above root causes, the preferred response (normative situation) to managing the likely consequences of climate change on the agriculture sector in Benin (based on the NAPA) is described in the following, and barriers have been identified that need to be overcome to reach this normative situation.

#### *Capacity to plan for and respond to climate change in the agricultural sector improved*

36. In the preferred adaptation scenario, planning for climate change risks and adaptation will take place at all relevant levels, reaching from the local community level to the commune level (district) to national levels. Tools that can be used by decision-makers and planners integrate CCA into (i) commune development plans (PDC) and budgets, (ii) into national level development instruments i.e. the Poverty Reduction Strategy Paper (PRSP; SCRP in French), and (iii) selected sectoral policy instruments of key relevance to the agricultural sector. For example, the Agricultural Revival Sectoral Strategy (PSRSA in French) will be adjusted to ensure that it adequately addresses climate change resilience and adaptation needs. If not it is likely to promote systemic maladaptive practices throughout the country. The developed tools will in future be applied to other relevant policy reviews and planning processes e.g. pertaining to inland fisheries, another key sector addressed by the LDCF project.

#### *Risk of climate induced impacts on agricultural productivity reduced at the community level*

37. In the preferred adaptation scenario, Communes in Benin are well positioned to address adaptation needs throughout villages in their Commune and to follow-up on the climate resilient PDCs developed. Dedicated Commune Adaptation Technical Committees would be established, commune level multi-stakeholder platforms that develop and implement annual adaptation work plans (PTAs). All relevant stakeholders will have the capacity to follow-up on these adaptation plans, including decentralised government institutions (e.g. MAEP/MEPN), all relevant structures within the Commune, and the local communities. Participatory Farmers Action Research and local level demonstration and adaptation investments at the village level will be implemented and local adaptive capacities be strengthened. Particularly climate resistant cultivars of rice and maize, already tested by MAEPs research institute IRAB would be applied amongst the farming community in relevant agro-ecological zones, whilst fishermen would be capacitated to apply adaptive measures to inland fisheries. Subsistence farming will be improved, as well as climate proof agriculture options for economic livelihoods will be furthered.



*Lessons learned and best practices from pilot activities, capacity development initiatives and policy changes disseminated*

38. In the preferred scenario, all relevant stakeholders in Benin have a strong understanding of the climate change risk posed to Benin as well as of adaptation needs and options. Lessons learned from the LDCF pilot project will be replicated and the tested approaches and adaptation measures are available for application throughout the country. Active contributions will be made to the UNDP Adaptation Learning Mechanism (ALM), an international learning and experience exchange platform by Benin on a regular basis.

**Barriers to solutions**

39. *Lack of systemic capacity, tools and methods to address CCA systematically in planning and implementation*

- Absence of holistic systemic approaches to managing climate change. Missing are directly needed adaptation interventions at all levels of governance, as well as a specific consideration of climate change in key planning and policy processes.
- Commune Development Plans (PDCs) currently do not address climate risks and adaptation needs.
- The PRSP, the key national development instrument, currently is not sufficiently climate change resilient to guarantee long-term sustainable development.
- Key sectoral policies at this stage do not address climate change. In the context of agriculture and food security instruments such as the Agricultural Revival Policy lack CC considerations and in its current state may promote maladaptive practices.
- Capacities to effectively address climate change risks and adaptation needs are generally limited, and concentrated in a few individuals associated with Government, University and private sector.
- Overall there are few financial resources to address adaptation needs – and overall government financial resources for outreach and agricultural development are already low.
- Although through Benin's innovative NAPA process, the Government engaged in a local level and bottom-up approach to addressing climate change and adaptation to date few local level follow-up projects are in place.

40. *Lack of capacities to develop and establish functional and sustainable farmers agro-meteorological EWS*

- Capacities for establishing a functional and end-user centred Early Warning System (EWS) are scattered. Whereas the Meteorological Services at the National Aviation Institution (ASECNA) has a mandate to gather data and provide information on meteorology, their services are currently not geared sufficiently towards the agricultural sector.
- Although a general understanding of agro-meteorology exists, the end-user focus is still largely lacking. Limited capacities exist in effective community outreach and a special effort has to be made to include communication needs as a major part of a EWS concept.
- Capacities in data processing, modelling for understanding the likely impacts of climate change on development including local expertise are lacking.
- Resource limitations prohibit the establishment of an effective weather observation network – currently Benin only has few first order weather stations and few agro-meteorological stations.

41. *Lack of community level support and local adaptive capacities*

- Although through Benin's innovative NAPA process, the Government engaged in a local level and bottom-up approach to addressing climate change and adaptation to date few local level follow-up projects are in place.



- Knowledge about adaptation options are limited at the community level, although existing coping strategies seem to be well understood.
- Communities require very specific support interventions on the ground, mainly related to developing and establishing short-cycle varieties of commonly used cultivars and the introduction of new cultivars i.e. rice. Information about seasonal climates and weather conditions and what cultivars to apply, is urgently needed.
- Support in form of investments into equipment and implemented is required.
- A lack of opportunities to develop and benefit from new markets is a key barrier to successful adaptation. New cultivars and crops should not only serve subsistence needs but should be developed as economic livelihood option. The full supply chain, including getting the right farming implements, transporting the produce to a market, creating relevant markets, dealing with price effects and so forth need to be addressed.
- Local farmers seem to be readily organised into various local level institutions that represent them, e.g. through farmers and producer associations, women groups and so forth. However, climate change and adaptation are not yet systematically taken up into the work agendas of such local level institutions.

#### 42. *Bottlenecks in extension service delivery*

- Although the Government of Benin has engaged in a concerted decentralisation effort, Communes are often ill equipped to service its clientele, and the national support framework is poor. Financial resources for outreach activities especially are extremely limited.
- Local farmers find that the Government is not sufficiently supporting their needs, and criticise that extension services are ineffective and do not reach the intended beneficiary.
- Government extension services, both of MAEP but also MEPN, and decentralised to the commune level, seems to be well established in terms of staffing, however would require systematic development of adaptation related knowledge and skills.
- On the commune level, where decentralised government departments and commune structures are currently set-up in parallel, concerted capacity support is required to ensure that all staff members are well positioned to address adaptation work on site.
- Lack of resources, as well as unclear mandates between these two parallel governance structures seem to be key bottlenecks preventing the most effective service delivery to communities, including for adaptation.
- Current management practices are not well adapted to take advantage of potential positive production potential, and an absence of knowledge about adaptation options inhibits development opportunities. The Commune structures as well as decentralised government institutions are poorly capacitated when it comes to addressing adaptation, needs and opportunities. A deficit in knowledge and skills to address climate change risks and already poorly functioning extension services prohibit the flow of adaptation capacity to rural communities.

#### 43. *Lack of understanding and knowledge of CCA needs, options and best practices and limited capacity building support and up-scaling*

- Whilst some commendable pilot projects have established useful demonstrations e.g. on improving agricultural production through applying soil and water conservation practices and using climate adapted cultivars (IRDC funded project, GTZ CCA pilot), these remain punctuated. Their outcomes are not readily absorbed into decision-making and up-scaling remains limited. Although some excellent lessons learnt can be derived from these interventions information is not easily accessible.
- At this moment adaptation pilots remain focused to the agricultural sector in a narrow sense and are limited to very narrow geographical areas. Considering that Benin is composed of distinct agro-ecological zones that face peculiar climate change risks and impacts and render the need for specific adaptation measures, the limited knowledge and experience in dealing with climate change in such varying regions is a major capacity gap in itself.



- In terms of documenting existing coping mechanism, improving them and ameliorating responses through innovation very limited expertise currently exists.
- Although a quite rich base of indigenous knowledge and set of practice dealing with climatic variability already exists in most of the communities consulted during the NAPA and LDCF project preparation, information and knowledge gaps are pertinent, especially in view of adaptation options.
- Largely adaptation experiences from within Benin remain poorly known, as well as an international exchange is nearly absent.
- Information and knowledge gaps exist not only at the local level, but refer also to the absence of sharing mechanisms between communities, and knowledge accessibility of technical staff and decision-makers.
- Key institutions such as the Directorate of Agricultural Training (DICAF) of MAEP tasked with the training of all personnel within MAEP, at this stage lack both the knowledge base but also critical skills that would be needed for an effective capacity building approach for Benin's key adaptation stakeholders.

#### 44. *Mismatch between traditional versus scientific knowledge and systems*

- Existing traditional knowledge and management systems often conflict with modern practices. For example, rainmakers<sup>20</sup> are well established institutions in Benin, and they enjoy much acceptance especially amongst the rural population. They play a significant role when it comes to discussing climate change, adaptation options and applying information such as EWS, keeping a strong influence on the rural community. Currently the rainmaker guild is not specifically included in discussions/mechanism on climate change.
- It is observed, that instead of improving adaptation measures through integrating different approaches, numerous barriers to successful adaptation result from such conflicts of traditional and modern knowledge and belief.

### 1.4. Stakeholder baseline analysis

45. Project interventions will range from the level of national government to that of village farmer. In order to foster ownership of the project from the onset, the project document was formulated with the help of stakeholder consultations. An overview of consultations that took place during the PPG phase is given in the below. More detailed descriptions of each major event and stakeholder lists are included in Annex 7, and full workshop reports are available<sup>21</sup>.

46. The **Project Preparation Grant (PPG) Inception Workshop** held on 25<sup>th</sup> March 2009. Stakeholders from the government departments; non-governmental organisations representatives as well as the international consultant were present. The objectives and workplan for the PPG phase were discussed, as well as presentations of ongoing climate change adaptation initiatives in Benin were presented.

47. **Consultations with Financial and Technical Partners** took place between 23<sup>rd</sup> to 27<sup>th</sup> of March 2009. The National Consultant, International Consultant, and a representative of MEPN and UNDP respectively, were present. The meetings served to gather baseline information on ongoing support relevant to the LDCF project, as well as to discuss co-financing options.

48. The National Consultant and selected national partners (MEPN, ASCENA, other) took part in two **field visits to Togo and Mali**. Whilst the visit to Togo exemplified local level adaptation experiences, the

<sup>20</sup> During PPG phase consultations it was explained that rainmakers are called in to call the rain to fall in a particular area, but also to influence that rain will be absent on another farmers' field. The observed changes in climatic and weather patterns are often being attributed to disputes between different farmers and rainmakers influencing the rain.

<sup>21</sup> MEPN – PPG 5, 2009. Minutes of stakeholder consultations – various. MEPN, Programme Intégré d'Adaptation aux Changements Climatiques dans le secteur de l'Agriculture pour la Sécurité Alimentaire du Bénin, Cotonou, Benin



Mali visit specifically served the experience exchange on the in Mali established local level agro-meteorological EWS. The concept for a Beninese EWS presented in this project document is based on and adapted from the Mali experience.

49. Detailed consultations with the local government structures and communities in the selected four agro-ecological zones took place between June and July 2009. The selected pilot communes and most pre-selected demonstration villages were present during the consultations. The LDCF project was introduced to the stakeholders, as well as local adaptation needs were confirmed. Capacity assessment elements were undertaken during the site visits. Reports from the consultations as well as individual transcripts of each consultative meeting are available<sup>22</sup>. A summary of the key adaptation and capacity needs is included in Annexes 3<sup>23</sup> and 4.

50. A suite review meetings on the draft project design, stemming from the various initial consultations, took place in each of the four selected agro-ecological zones from the 22<sup>nd</sup> July to 4<sup>th</sup> of August 2009. A wide range of stakeholders on the commune level were present, including commune representatives, representatives of key line ministries (i.e. MEPN, MAEP), non-governmental organisations (NGOs), farmer's organisations and community/village representatives.

51. A validation of revised project design workshop took place at national level on 13<sup>th</sup> and 14<sup>th</sup> August 2009. National level stakeholders from different government departments, NGOs, University, relevant projects, cooperation partners and private sector representatives were present.

52. During early September spot field visits were undertaken (Zone 5 and 8) with the International Consultant to confirm local priorities and implementation arrangements for the LDCF project.

53. On 8<sup>th</sup> September the finally agreed project design was discussed and agreed to by senior decision makers and project partners at the final project design meeting at MEPN. Chaired by the Director General of the MEPN the meeting approved the final design. Presentations were made to the Honourable Minister after the meeting.

54. A Financial and Technical Partners Project Consolidation Meeting was held on the 10<sup>th</sup> of September 2009, presenting the final project design and soliciting final co-financing arrangements.

55. Table 1 below contains the list of key Ministries/Departments and other partners and their envisaged role in the execution and implementation of the LDCF project.

Table 1: Ministries and departments involved in the project and their specific roles.

Ministry/ Department/ Organizations	Role in Project
Ministry of Environment and Nature Protection (MEPN)	<ul style="list-style-type: none"> <li>Will serve as the Government Cooperating Agency.</li> <li>Will be directly responsible for government's participation in the project.</li> <li>Will chair the Project Technical Committee (PTC) through the Department of Environment (see below)</li> <li>Served as a resource institution during the PPG for activities related to the environment.</li> <li>Departmental staff (Environment and Forestry Department) will be engaged at a local level to implement certain environment-related interventions.</li> </ul>
Department of Environment (DEnv)	<ul style="list-style-type: none"> <li>Will serve as the implementing Department and will, therefore, be responsible for executing the project.</li> <li>Will chair the Project Technical Committee (PTC).</li> <li>Served as the resource institution during PPG for technical aspects related to environment production.</li> <li>Will delegate implementation responsibilities to decentralised departmental or commune level.</li> </ul>

<sup>22</sup> MEPN – PPG 5, 2009.

<sup>23</sup> The Annex is based, amongst other, on the assessment report MEPN – PPG 3. Strategy de Renforcement des Capacities. MEPN, Programme Intégré d'Adaptation aux Changements Climatiques dans le secteur de l'Agriculture pour la Sécurité Alimentaire du Bénin, Cotonou, Benin



<b>Ministry of Agriculture, Livestock and Fisheries (MAEP)</b>	<ul style="list-style-type: none"> <li>• Will implement project activities through its extension network.</li> <li>• Will co-chair the Project Technical Committee (PTC).</li> <li>• Served as the resource institution during PPG for technical aspects related to agricultural production, livestock and fisheries related interventions.</li> <li>• Will designate a representative for the project who will perform the role and functions of either the Executive or Senior Beneficiary on the project board.</li> </ul>
<b>Department of Policy and Planning</b>	<ul style="list-style-type: none"> <li>• Will be a member of the PTC.</li> <li>• Will be responsible for reviewing existing policies to ensure the incorporation of climate change considerations.</li> <li>• Will facilitate the sharing of lessons and experiences at a national level as resources permit.</li> <li>• Served as a resource institution during the PPG for policy-related issues.</li> <li>• Responsible for M&amp;E.</li> </ul>
<b>Benin Agricultural Research Institute (INRAB)</b>	<ul style="list-style-type: none"> <li>• Will be a member of the PTC.</li> <li>• Researches the feasibility of drought-resistant crops, agro-forestry for livelihood diversification, and other relevant technical matters.</li> <li>• Will provide field-level technical support to farmers in the project areas where necessary.</li> <li>• Will conduct field-level adaptation research concerning crop diversification options.</li> <li>• Will be responsible for adaptive technologies demonstrations.</li> <li>• Will provide training to project staff and farmers concerning the adoption of suitable drought-tolerant crop varieties that have been tested and proven suitable.</li> </ul>
<b>National Agricultural Information Department</b>	<ul style="list-style-type: none"> <li>• Will be a member of the PTC.</li> <li>• Will disseminate climate change information.</li> <li>• Will be part of Agro-meteorological Technical Group (GTA) and Zone Agro-meteorological Technical Group (GTZA) and potentially will serve as a channel for disseminating weather data from Benin Meteorological Department to local farmers.</li> <li>• Serves as a channel for disseminating information concerning improved climate resilient practices (e.g. through radio and television programmes).</li> </ul>
<b>Ministry of Energy and Water (Department of Water)</b>	<ul style="list-style-type: none"> <li>• Will be a member of the PTC.</li> <li>• Provide technical assistance concerning water-related activities such as dam building.</li> <li>• Will assist with the revision of water-related policies to ensure that they incorporate climate change considerations.</li> <li>• Served as a resource institution during the PPG for activities related to water resources.</li> <li>• Responsible for collection of hydrological data at the pilot sites, as appropriate.</li> </ul>
<b>Ministry of Communication</b>	<ul style="list-style-type: none"> <li>• Will be a member of the PTC.</li> <li>• Served as a resource institution during the PPG for activities related to meteorology information and dissemination.</li> </ul>
<b>Ministry Transport (Benin Meteorological Service)</b>	<ul style="list-style-type: none"> <li>• Will be a member of the PTC.</li> <li>• Served as a resource institution during the PPG for activities related to meteorology.</li> <li>• Will be part of Agro-meteorological Technical Group (GTA) and Zone Agro-meteorological Technical Group (GTZA).</li> <li>• Supervises and provides technical assistance on climate modelling and downscaling of climate information.</li> <li>• Will be contributing of activities related to meteorological information production and dissemination.</li> </ul>
<b>Ministry of Public Security (Disaster Management Department)</b>	<ul style="list-style-type: none"> <li>• Will be a member of the PTC.</li> <li>• Served as a resource institution during the PPG for activities related to the impacts of climate hazards.</li> <li>• Will be part of Agro-meteorological Technical Group (GTA) and Zone Agro-meteorological Technical Group (GTZA).</li> <li>• Will be a recipient of project information and input from the project to incorporate climate change projections into disaster management plans, policies and projects.</li> </ul>



United Nations Development Programme (UNDP) Country Office	<ul style="list-style-type: none"> <li>Served a technical advisory role during the PIF and PPG processes.</li> <li>Provided technical support to the Project Manager during the site selection workshops and project preparation phase.</li> <li>Will provide support to the National Project Coordinator and the PS concerning the implementation of project components.</li> <li>Will be responsible for reporting project progress to GEF.</li> <li>Will participate in the PTC.</li> <li>Will be responsible for monitoring (technically and financially) the use of project funds.</li> <li>Will mobilize and coordinate support from international partners through a global network.</li> <li>Will facilitate the international dissemination of project knowledge and lessons.</li> </ul>
Communes	<ul style="list-style-type: none"> <li>Were consulted during the PPG process.</li> <li>Participated in the pilot commune and site selection process.</li> <li>Members of the field mission teams.</li> <li>Will be key beneficiaries and participate in the planning and implementation of the project interventions at the commune-level.</li> </ul>
Universities and research institutions	<ul style="list-style-type: none"> <li>Served as resource institutions during the PPG, especially on ongoing CCA related initiatives.</li> <li>Will be key partners in the planning and implementation of the project interventions at the community-level i.e. as member of the Technical Support Mechanism.</li> </ul>
NGOs	<ul style="list-style-type: none"> <li>Served as resource institutions during the PPG, especially on ongoing CCA related initiatives.</li> <li>Will be key partners in the planning and implementation of the project interventions at the community-level i.e. as member of the Technical Support Mechanism.</li> </ul>
Local Communities/ CBOs	<ul style="list-style-type: none"> <li>Were consulted during the PPG process.</li> <li>Participated in the pilot site selection process.</li> <li>Members of the field mission teams.</li> <li>Will be key beneficiaries participate in the planning and implementation of the project interventions at the community-level.</li> </ul>

#### Selection of pilot communes and demonstration villages

56. The PPG phase selected pilot communes and demonstration villages through a systematic decision-making process identifying Communes that are particularly vulnerable<sup>24</sup>, and confirmed them through a participatory and consultative selection process.

57. It is understood that the selections made during the PPG phase will be confirmed during the Inception phase of the LDCF project. Available resources need to be confirmed against the local level priorities and a design that allows for relevant inputs at the local level is sought for.

#### Description of selected Pilot Communes in four agro-ecological zones

58. The four agro-ecological zones covered by the pilot projects are the following: Zone 1 - Far North, Zone 4 - West-North Atsora-Donga, Zone 5 - Central Cotton zone (Cotonnière du Centre), and Zone 8 - the Fisheries zone (Pêcheries). The environmental parameters and prevailing livelihood strategies differ drastically in these four agro-ecological zones. Consequently local adaptation needs and existing coping mechanisms also vary. A detailed assessment was undertaken during the PPG phase and a full report is available<sup>25</sup>. Annex 4 contains a summary of the findings. In the following the four agro-ecological zones and selected pilot communes are described briefly.

59. **Zone 1: Far/Extreme North (Pilot commune: Malanville):** Agro-ecological Zone 1 encompasses the region of Alibori with seven communes. Overall an area of 9,057 km<sup>2</sup> is covered by Zone 1 and around

<sup>24</sup> MEPN – PPG 4, 2009.

<sup>25</sup> MEPN – PPG 1, 2009.



141,207 people live in this zone (2002). The main ethnicities in the area are Dendi, Gourmaritche, Haoussa, Peuhl and Tchenga. Over 82% of the population is rural living, directly depending on agricultural activities for food security and income generation. In the Far North, the main agricultural activities are the cultivation of millet, sorghum, cotton, vegetables, and rice. Cattle husbandry, fishing, and hunting provide additional food and income. The current adaptation mechanisms expressed by the farmers were the change of food uptake from three times a day to twice a day, and the practice of short rotation sorghum cultivation (with rotation periods of two to three months). For the project it is proposed to work with the commune of Malanville as a pilot partner. Only one commune is selected for this agro-ecological zone.

60. **Zone 4: West- North-Atacora Donga (Pilot communes: Materi and Ouake):** Agro-ecological Zone 4 includes two regions, i.e. Atacora and Donga (partially shared with Zone 5), with nine and four communes respectively. The area of the zone is 16,936 km<sup>2</sup>, and the overall population is estimated at 629,973 (2002). The main ethnicities in the zone are Berba, Betammarimbe, Lokpa, M'Berme and Yowa. Over 75% of the population are believed to live in rural areas. In West Atacora-North Donga, different cereals and sweet potatoes are cultivated. The local population practices a wide range of adaptation measures. These include – but are not limited to – rice and vegetable cultivation, techniques to retain soil moisture, soil improvement by adding organic materials, subsidies of grains, and short rotation rice cultivation (of two and a half to three months). Farmers also mentioned that vegetable cultivation has generated income to some community members, which enabled them to pay for their children's education. The project selected pilot communes are Materi and Ouake.

61. **Zone 5: Central Cotton Zone (Cotonnière du Centre) (Pilot communes: Savalou and Aplahoué):** Agro-ecological Zone 5 stretches across four regions, Collines, Donga (partially shared with Zone 4), Borgou, Couffo and Plateau. Overall 31,722 km<sup>2</sup> are covered by the zone, and over 864,205 (2002) inhabitants live in the area. Main ethnicities are Adja, Anni, Bariba, Fon, Holli, Idatcha, Kotocoli, Lokpa, Mahi, Nago, Peuhl and Yoruba. Over 79% of the population lives rural livelihoods. In Central Cotton Zone, cereals, cotton, and pulses are the main agricultural output. There is very little information on current adaptation measures. The farmers which were consulted stated that a shift towards rice cultivation is the prevalent adaptation mechanism at the moment. Pilot communes selected for the project are Savalou, and Aplahoué.

62. **Zone 8: Fisheries (Pêcheries) (Pilot communes: Bopa, So Ava, Adjohoun and Ouinhi):** Agro-ecological Zone 8 covers 3,151 km<sup>2</sup>. The overall population is estimated as 712,292, indicating a very high population density of 226 inhabitants per km<sup>2</sup>, the densest observed in Benin. 78% of the population in this area are rural living. Fishing is the main livelihood-generating activity in Pêcheries. Maize, manioc, and vegetables are also cultivated in Pêcheries, however, the lack of space for agricultural cultivation due to the high population density is a limiting factor (MEPN, 2008). The consultations with the population of nine village communities generated knowledge on a wide range of adaptation mechanisms. In relation to water management, community members mentioned water retention and conservation, irrigation, and the use of motorized water pumps. Drainage is practiced to avoid flooding of fields near water courses. Furthermore, agricultural practices are adapted by short rotation maize production (two and a half months), seed preparation to foster earlier germination, and fallow for soil regeneration. The village communities also make use of indigenous knowledge on climate forecasting. In relation to rainfall forecasting, they observe the appearance of specific star constellations at a certain time of year. Rainmakers can generate rainfall or stop it at anytime particularly in wet season; they play a pivotal role in overall management and opinion about climate and weather. Four communes have been selected as pilot partners in the LDCF project, namely Bopa, So Ava, Adjohoun and Ouinhi.

63. For replication of the pilot approach in nine additional pilot communes the following communes have been selected; Zone 1: Karimama; Zone 4: Tangueta and Boukoubé, Zone 5: Tchaourou, Ouesse, and Zone 8: Athieme and Grand Popo.

#### **Description of commune and decentralised government structures**

64. The decentralised Government was established in 1999, with the passing of the decentralisation law of 97-028 of January 1999. The Mayors (les Maires) of the communes hold the most senior position in the decentralised government and report directly to the President of the Commune Council (Conseil Communal). District (Arrondissement) Chefs report to the Mayor, whilst Village Chefs report to the District



Chefs. The Secretary General (Secrétaire Général) is the highest public office holder tasked with the management and public administration of commune affairs, reporting to the Mayor. About five Directorates are set up in the commune management structure for technical services (Chef de Service Technique), financial services (Chef Service Affaires Financières), civil state and population services (Chef Service d'Etat Civil et Population), state affairs and environment services (Service des Affaires Dominales et Environnementales; SADE) and the planning and economic development service (Chef Service de la Planification et Développement Economique). Local sub-divisions such as for environmental affairs and nature protection under the technical services are set up. It is this structure that plans and is responsible for commune level and local government in Benin. The LDCF project will work closely with the commune structure and its responsible staff members.

65. Aside the Commune structure, decentralised services of the line Ministries are deconcentrated to the commune level. National Ministries such as the Ministry of Agriculture, Livestock Husbandry and Fisheries (MAEP) and the Ministry of Environment and Nature Protection (MEPN) have regional (departmental) representations in six of the 12 political regions in Benin. In each region, services are further devolved to the commune level with staff representation in each commune. Whilst the Commune structures are responsible for the planning and implementation of interventions on the village and commune level, the technical services of the deconcentrated line Ministries play the role of technical support and advice.

#### **Demonstration villages, local level institutions and up-scaling partners during phase 2**

66. The project will select nine villages (one in each pilot commune) to serve as demonstration sites for intense CCA support during phase 1 of the project (foreseen to be a 2 year demonstration phase). During the PPG phase potential partner villages were pre-selected by the local governance structures and based on adaptation priority criteria, and were involved in the project formulation. An in-depth report from the consultations and planning is available<sup>26,27</sup>. It is understood that during the inception phase of the LDCF final partner selection will take place, based on the initial assessment results. In terms of design villages beyond nine demonstration sides will be included through up-scaling and replication initiative (see Strategy section below).

67. At the village level numerous local level institutions exists such as producer forums and cooperatives, farmers associations, various types of women groups, youth groups and so forth. Each of the consulted villages indicated such existing structures, which will be included as critical local level partners in the project design.

<sup>26</sup> MEPN – PPG 1, 2009.

<sup>27</sup> The following villages were visited during the PPH phase, however are not necessarily part of the demonstration villages during project implementation: in Zone 1 Toumboutou and Monia (both Malanville Commune), Zone 4 Tanguieta, Tiele and Ouankou (Tanguieta Commune), Kadolassi and Allitokoum (Ouake), Zone 5 Dame and Ahougnankanme (Savalou Commune) and Zone 8 Adame, Dolivi and Houedja (Ouinhi Commune), Sehom and Agbodji (Bopa Commune), Quedo wo and Dekanmey (Adjohoun Commune) and Hounmey and Lokpo (So Ava Commune) were included in the assessment.



## 2. Strategy

### 2.1. Project rationale and policy conformity

#### LDCF Conformity

68. The Republic of Benin ratified the UNFCCC on 30 June 1994 and is classified among the non-Annex 1 parties. Benin has developed and submitted its NAPA to the UNFCCC (January 2008) and is entitled to benefit from the LDC Fund for the implementation of priority measures identified in its NAPA.

69. The proposed project has been prepared fully in line with guidance provided by GEF and the LDCF Trust Fund. The project follows the guidance from 'Programming Paper for Funding the Implementation of NAPA's under the LDC Trust Fund (GEF/LDCF 2006).

70. Firstly, in line with GEF/LDCF (2006), this project was identified and conceived through the participatory NAPA process in Benin. Moreover, it was designed to be consistent with, and supportive of, national development strategies, as expressed in the PRSP and related documents in Benin. It is fully aligned with the UNDAF and CP, which address climate change priorities specified in the National Strategy on Climate Change and PRSP as a matter of priority.

71. Secondly, the project addresses the urgent and immediate activities identified in the NAPA, and is in line with the priority sectors identified in GEF/LDCF (2006) at a global basis. Notably, this project focuses on urgently needed adaptive capacities in four agro-ecological zones in Benin, and addresses priorities identified in the agriculture and food security sectors. It builds local community adaptation capacities as well as it strengthens Commune and decentralized government services to be able and address adaptation in a well informed and knowledgeable way. The systemic capacity to address adaptation in Benin is strengthened through targeted interventions at the policy, planning and budgeting levels.

72. Thirdly, this project is designed to be an integral part of, and support to, the ongoing development process in Benin and supports the newly established decentralized governance system. The project has been developed with key stakeholders at all levels in the agricultural, rural development and food security sectors. It integrates critical climate change resilience elements into already established policy and programme contexts. For example, it supports the climate proofing of the Agricultural Revival Strategy of Benin, which without the project intervention may lead to systemic promotion of maladaptive practices.

73. Finally, this project has been designed to address the additional costs imposed on development by climate change. As such the Government of Benin and especially the pilot Communes have mobilized a significant amount of co-financing, amongst other through integration into existing government budgets, including at the Commune level. The project supports specific activities that would not be necessary in the absence of climate change.

#### Overall GEF Conformity

74. The project has been designed to meet overall GEF requirements in terms of design and implementation. For example:

- **Sustainability:** The project has been designed to have a sustainable impact, at village and at national level. See section on Sustainability below for more details;
- **Monitoring and Evaluation:** The project is accompanied by an effective and resourced M&E framework, that will enable an ongoing adaptive management of the project, ensuring that lessons are learnt, management decisions are taken based on relevant and up-to-date information, and regular progress reports are available for concerned parties;
- **Replicability:** Great attention has been paid in the project design to ensure that lessons are replicable, and that the necessary replication mechanisms are in place. See section below on Replicability for more details;



- Stakeholder involvement: Following on from the NAPA process, the design of this project was effectively participatory. Moreover, the design of the project ensures the appropriate involvement of stakeholders in project implementation and monitoring.

## 2.1. Country ownership: country eligibility and country drivenness

75. The Republic of Benin ratified the UNFCCC on 30 June 1994 and is classified among the non-Annex 1 parties. Benin has developed and submitted its NAPA to the UNFCCC (January 2008) and is entitled to benefit from UNDP support. The proposed project has been endorsed by the UNCCD and GEF Focal Points in Benin, respectively.

76. This project fully reflects the priority measures identified by the Republic of Benin in its NAPA, i.e. priority 1 "implement a climate change risk and EW system for food security in four agro-ecological zones". Furthermore, the project will contribute to the country's national development goals such as set out in the Second Poverty Reduction Strategy Paper (PRSP). Agriculture, the main livelihood activity and one of the driving force of Benin's economy, is a leading priority for the Government. The Government has been involved in a number of programs, which are related to the LDCF project, such as:

- Support to improved agricultural productivity;
- Rural infrastructures;
- Support to develop markets;
- Support to rural economic growth; and
- Emergency program to support food security.

77. The LDCF project responds to national priorities set out in the Millennium Development Goals (MDGs). The benefits of the project include increased food security thereby positively affecting MDG 1, better health outcomes (as a result of better nutritional status) thereby positively affecting MDGs 4 and 6. Furthermore, the anticipated improved farming practices will lead to increased environmental sustainability, which will positively affect MDG 7.

78. The Government of Benin is making climate change an important element of its work, and the LDCF project is in line with and can be linked to various implementation aspects of the Second National Communication (SNC) under the UNFCCC, currently underway in Benin.

79. Climate change has been integrated as a key focus in the UNDP and CPAP between the UN system and the Government of Benin, with CPAP Output 2 reading "In response to climate change risks, adaptation strategies and measures are developed and implemented in the most vulnerable zones". The LDCF project directly responds to this output.

80. Updating critical sectoral strategies, such as the Agricultural Revival Strategy (NGSPR) as a result of the project's intervention will enable the integration of climate change into sectoral development plans and programs.

81. The Republic of Benin has developed a National Charter on Environmental Governance within the framework of decentralization. This Charter specifies the roles and responsibilities of line ministries, locally elected representatives and civil society in the area of environmental management. Hence, the State, through its deconcentrated structures, plays the support and advisory role for the Communes in the implementation of their development projects. This support and advisory role is accompanied by a skill transfer, which has occurred gradually within all development sectors. The Communes have gained capacities and have developed their Communal Development Plans (PDCs). This project will use a decentralized approach to manage climate change impacts through strengthened capacities at the community and municipal levels. Accordingly, the PDCs will be updated to take into account the environment, specifically climate change.

82. Therefore, in summary, the proposed project complies with national priorities, since it integrates the "climate change adaptation" dimension into the development of the agricultural sector, a strategic pillar of the NGSPR and considered by the NAPA as being the most vulnerable. It is also closely linked to the process of decentralization currently underway in Benin since it strives to complement strengthening



adaptive capacities for regional and local services through the implementation of local development plans that integrate climate change.

## 2.2. Design principles and strategic considerations

83. This LDCF project is the first specific NAPA follow-up project in Benin. Few other projects implemented at the local level have a specific adaptation focus. The Government of Benin is currently implementing the Second National Communication (SNC) under the UNFCCC, coordinated by the Climate Change Unit within MEPN. Other related work is mainly stemming from a pilot investment made by GTZ, piloting local level adaptation measures in two villages in Zone V. The project is already finalised, but some interesting lessons learnt in terms of investment needs at the local level are considered in the design of the LDCF project. GTZ availed 180,000 Euro for the 18 months intervention. Benin is beneficiary from the CC-Dare project and a small-size education activity is being implemented with an NGO and University. School level curricular integrating CC and CCA are being developed with the 150,000 US\$ investment. A four-year investment of IRDC has leveraged focused adaptation learning at the local level in 35 communes in Benin, in collaboration with local NGOs. A in the 1980's implemented agro-meteorological support programme had made major investments into strengthening user-focused forecasting information. Although the project discontinued after project funds were exhausted, it is clear that it had strong and positive capacity impacts on the technical level, on which the LDCF project will draw.

84. The project will also be supported by the National Environmental Management Program (PNDC-GEM), which aims to develop environmental management tools, implement the international Conventions, protect biodiversity and prevent pollution. As with all projects involving several partners, an institutional framework that supports efficient coordination will be set up and will intervene in accordance with effective UNDP management standards.

85. Strategic linkages are established with Decentralisation Support activities supported by UNDP, and project implementation will take place using already established structures at the Commune level.

86. Overall, UNDP has developed a strong capacity in leading and supporting climate change adaptation interventions especially in Africa. UNDP's Strategic Plan includes a key results area on promoting climate change adaptation, and has developed a strong technical framework on adaptation work, based on in country experiences. UNDP furthermore has a strong capacity building and policy development focus in all its operations. A strong international technical support on adaptation, building on several years experience in a multitude of African countries and world-wide, is available within UNDP, and country support can be rendered.

## 2.3. Project Objective, Outcomes and Outputs/activities

87. The overall Goal of the project is "To contribute to Climate Change Resilient Agricultural Production and Food Security in Benin". The **Project Objective** is "To strengthen capacities of agricultural demonstration communities in selected Communes to adapt to extreme event and climate change in four vulnerable agro-ecological zones in Benin"

### **OUTCOME 1: CAPACITY TO PLAN FOR AND RESPOND TO CLIMATE CHANGE IN THE AGRICULTURAL SECTOR IMPROVED.**

88. Baseline<sup>29</sup>. Baseline activities pertaining to climate change and adaptation under outcome 1 are mainly revolving around ongoing work in MEPN under the National Action Programme for Climate Change

<sup>29</sup> Detailed reviews of projects and programmes ongoing in the agricultural and in the environment sectors in Benin were prepared during the PPG phase. Kindly note that the full reports are available in French (MEPN – PPG 2, 2009. Points des Projets et Programmes En Cours Ou Executes Dans Le Secteur de L'Agriculture, MEPN, Programme Intégré d'Adaptation aux Changements Climatiques dans le secteur de l'Agriculture pour la Sécurité Alimentaire du Bénin, Cotonou, Benin). For the purpose of the baseline (under all outcomes), relevant summary information has been



Adaptation and ongoing work under the Second National Communication. Both interventions aim to develop a national climate change (adaptation) policy framework, and potentially including a national strategy and action plan. However, limited progress has been made in the implementation of these aspects of the projects.

89. Although the Government of Benin is recognising the importance of climate change in development frameworks (e.g. UNDAF and CPAP), currently local, national and sectoral development planning is taking place without taking climate change risks sufficiently into consideration. Development budgets are perceived overall low, and they do currently not cater for increasing costs dealing with climate change risks and emergencies such as frequently failing harvests, which will put thousands of farmers at risk of livelihood insecurity and food insecurity. Under the baseline it is the rural population and especially local farmers that feel the major impact of the poorly designed plans and policies and lack of urgently financial investments into developing adaptive capacities.

90. Climate change resilient planning is not currently taking place, neither on the local farmers nor at upper-tier government levels). Critical information needs for such planning are not covered in Benin. Although a basic agro-meteorological information system exists, this system is under-performing and leaves farmers without a reliable information system for day to day land management and agricultural decision making. This renders them increasingly vulnerable to the challenging climate conditions.

91. Adaptation Alternative: The PDCs (2008-2013) of nine selected pilot communes in four agro-ecological zones will be developed in a manner that they address the specific climate change risks pertaining to the respective commune. Based on the lessons learnt from the pilot communes and applying specific planning tools developed, other communes will take up the CC proofing approach in the 2<sup>nd</sup> generation of PDCs. It is important that hand in hand with the planning process provisions for financing are being made. Therefore the project will work directly with the pilot communes on including CCA costing in their respective budgets.

92. The deconcentrated government services of MAEP and MENP will include climate change resilient planning in their own sectoral policies and the operationalisation through annual workplans. Relevant budget allocations will be made at national and decentralised levels to ensure that meaningful action in the context of managing long-term climate change risks will take place.

93. To enable more informed planning and response management of agricultural resources, the LDCF project supports (i) the production of vulnerability maps which will guide future CCA investments e.g. through the PDCs, and (ii) strengthen an EWS or agro-meteorological service that will make critical information for farmers available, such as predictions of seasonal climate and recommendations about which agricultural produce to focus on in alignment with the climatic situation. Although the end-used focused services will be piloted in the selected communes and eight demonstration villages in particular, the services will be made available more widely (e.g. through community radio). Additionally significant investments into infrastructure development of local agro-meteorological observatories and capacity support to National Meteorological Service (ASECNA), MAEP and other technical institutions will be made.

94. The project will make targeted contributions to strengthening the capacity of public and private sector institutions to provide strong technical and research-based information for improved CCA planning and decision-making. MAEP's DICAf will be positioned to develop a climate change risk and adaptation specific training portfolio that will enable Benin to develop a critical mass of practitioners to address adaptation needs at all levels required.

95. Co-financing amounts for Outcome 1:

Cash:	US\$ 550,000
In-kind:	US\$ 1,000,000
LDCF Project Grant Requested:	US\$ 500,650

used.



96. **Output 1.1: Local and national development plans/ sectoral strategies (i.e. Commune Development Plans, PRSP (PSRSA), Agriculture Strategy) are climate change resilient / address climate change risks**

**Activity 1.1.1:** Undertake assessment of relevant existing plans/strategies and identify strategy for how to be climate change proof these instruments (i.e. National Poverty Reduction Strategy, 2<sup>nd</sup> generation of Commune Development Plans (PDC), Strategic Plan on Agricultural Revival)

**Activity 1.1.2:** Develop method for mainstreaming CCA (based on already existing international experiences)

**Activity 1.1.3:** Train policy makers and technical staff at regional, commune and national level in the application of the CCA mainstreaming method and adaptive planning

**Activity 1.1.4:** Develop and apply M&E tool that tracks action on CCA

**Activity 1.1.5:** Develop and implement strategy of how to upscale the CCA tools for the PDC and budgeting for nation wide application/ replication

97. **Output 1.2: Commune and national and decentralised agricultural sector budgets incorporate allocations to the prevention and management of risks and impacts of variability and climate change**

**Activity 1.2.1:** Develop methodology of how to assess financial needs for CCA and how to address CCA costing in national/decentralized and commune level budgeting, as well as private sector and donor cooperation

**Activity 1.2.2:** Train local experts in CCA related financial analysis and budgeting

**Activity 1.2.3:** Develop stakeholder specific awareness raising strategy on CCA financing and budgeting needs

**Activity 1.2.4:** Test methodology in selected pilot communes (same as in Output 1.1)

**Activity 1.2.5:** Develop climate change proof budgets for agricultural sector as pilot; upscale to other sectors (e.g. fisheries) as appropriate

98. **Output 1.3: National strategy for effective and efficient agro-meteorological service delivery to local farmers under implementation**

**Activity 1.3.1:** Assess agro-meteorological information needs and current capacities (local and national level)

**Activity 1.3.2:** Develop concept for national strategy in consultation with key stakeholders at service provider and client level (incl. research and data capture, analyses, transformation of data into information useful to the end user, communication strategy, dissemination plan, costs, M&E component) (see Annex 6 for draft concept)

**Activity 1.3.3:** Test national strategy elements in project pilot areas (involve communities in data collection; development of numerical models; etc.)

**Activity 1.3.4:** Improve the agro-meteorological station network in project pilot areas

**Activity 1.3.5:** Develop and implement capacity building strategy for service providers at national and commune level, as well as end users of information in project pilot areas

**Activity 1.3.6:** Based on pilot experiences develop long-term National Strategy on EWS; secure funding for rolling out

**Activity 1.3.7:** Establish a permanent multi-disciplinary working group on Agro-meteorology lead by MAEP with national and commune representation

99. **Output 1.4: Training programmes of technical services (at national, departmental, commune and local level, through DICA) integrate climate change risk and weather forecasting components**



**Activity 1.4.1:** Assess CCA training needs amongst key stakeholders at different levels (for technical staff from line ministries (technical departments, extension services) and local farmers, breeders, fishermen on designing and implementing relevant climate risks management measures)

**Activity 1.4.2:** Develop and implement training strategy; address mainstreaming of CCA components into existing trainings as well as new training opportunities; integrate into training guides of the Agricultural, breeders and fishing Council

**Activity 1.4.3:** Capacitate DICAF as competent training authority

**Activity 1.4.4:** Develop M&E framework that tracks impacts on trainees (change in level of knowledge, application of new knowledge, change in attitudes etc.)

**100. Output 1.5: Climate change vulnerability and risk maps for the agricultural sector (crops and livestock) are developed for 4 agro-ecological zones**

**Activity 1.5.1:** Develop climate change vulnerability and risk maps on the agricultural sector in the four agro-ecological zones

**Activity 1.5.2:** Develop/ update climate/weather risk information and develop calendars of seasonal climate trends incl. recommendation on what to plant when

**Activity 1.5.3:** Develop maps and guides of the agronomic potential in the four agro-ecological zones

**Activity 1.5.4:** Train farmers-breeders and fishermen in the application of the maps and guides

**Activity 1.5.5:** Develop community information materials/activities and dissemination; link to output 1.4 and output 2.4

**OUTCOME 2: RISK OF CLIMATE INDUCED IMPACTS ON AGRICULTURAL PRODUCTIVITY REDUCED AT THE COMMUNITY LEVEL**

101. Baseline: A great deal of critical baseline activities in the agricultural and food security sectors relevant to outcome 2 are ongoing in Benin<sup>29</sup>. The Government of Benin is implementing key programmes to support agricultural research, outreach and development throughout the country and decentralised service delivery. All these baseline activities lack explicit reference and action on building climate change resilience and adaptive capacity at this moment and without the contributions of the planned LDCF project.

102. More than 14.9 Million CFA are allocated to a programme that strengthens the planning and implementation capacities of the agricultural sector across all regions of the country (2005 to 2010). Regional Agricultural Centres (MPRC/CeRPA) are further supported by 16 Million CFA over a five year period ending in 2010. Research support that assesses and supports the agricultural production potential throughout Benin in the region of 50 Million CFA between 2005 and 2012 is being invested, promoting agricultural development in all regions of the country. Specific research on water based and halieutic products and specific plants such as tubers and roots are under implementation. A major part of the funds are allocated to INRAB, strengthening agricultural research capacities in Benin. Another line of support is allocated to rural outreach and rural development. Certain parts of this 195 Million CFA investment are allocated to specific regions, but all funds focus on the improvement and/or development of new agricultural, livestock and fisheries products and improved management and production systems. The investments are to a large extent expended through the national budget, and in some cases through programmes supported by development cooperation. Rice development, mechanisation of agriculture, participative agro-business development, food security support through availing seeding material and establishing a decentralised supply chain of required farming inputs, development of the milk and beef production sectors, development of the inland fisheries sector are just some of the examples of such baseline activities. Relatively fewer investments are visible into the animal husbandry and fisheries sectors compared to cultivation.

<sup>29</sup> MEPN – PPG 2, 2009.



103. In terms of decentralisation, support has been rendered through the Decentralisation Support Programme (with the UN), the GTZ and currently the MCA is identifying priorities for local and commune level governance support. Such support could potentially take place in the selected pilot communes and be used as baseline investments for the LDCF project in the region of investments of 200 Million/year CFA. Overall annual commune budget are in the region of 0.5 Million/year CFA, with a minor percentage allocation to adaptation related rural development activities.

104. In the baseline there is currently no or very limited climate change and adaptation specific action implemented at the Commune and village levels in Benin. Whilst the NAPA has set a foundation for bottom-up planning of adaptation priorities, currently none of the proposals are systematically being implemented.

105. Natural resource based production systems, such as agriculture (including cultivation and livestock husbandry) and inland fisheries, which are extremely vulnerable to climate change impacts, remain unchanged. Farmers who are challenged by a change in the onset of the growing season, for example, lose their harvests as the traditionally used cultivars are not adapted to the newly prevailing climatic conditions. Extreme flooding has washed away entire harvests and led to the moulding and perishing of plants. Increasingly frequent and intense droughts in northern Benin and in neighbouring countries have led to an increased transhumance with herders moving across longer distance to find grazing for their livestock. Previously set up agreements are not being observed and land use conflicts occur. The through climatic changes strongly influenced changes in water balance in the "lake region" has led to changes in fish populations. Whilst overfishing is a non-climatic threat, warming of the water has led to changes in species composition and overall productivity.

106. Adaptation Alternative: Addressing the climate change risks will require the active participation of communities and in particular, testing tangible actions that can reduce the risks of climate change impacts manifesting in the first place. Building on the PDCs for the selected pilot communes, contracts will be signed with the communes and through the established Commune Adaptation Technical Committee, commune level multi-stakeholder platforms, annual adaptation work plans (PTAs) will be prepared and implemented. These workplans will set out adaptation action to be taken by the decentralised government institutions (i.e. MAEP and MENP) and the relevant structures within the Commune. They will be led by the Chef de Service responsible for rural development at the Commune. The technical committee will include representatives from the village level, i.e. through producers associations or other. The PTA will set out the work in the demonstration village selected in each commune as well as adaptation action that will take place at other sites. The needs assessment carried out during the PPG phase<sup>30</sup> (summary Annex 5) already sets out some priorities for village level adaptation action, which will form the foundation for the planning.

107. To overcome the perceived and often cited mismatch between Government Services and the needs of the local farmers, the project will particularly focus on establishing a dialogue and interactive and needs based work programme. A participatory approach is key to this, and will be promoted through the project. Farmers Action Research and local level demonstration and adaptation investments at the village level will be a priority under this outcome. The project will additionally focus on strengthening the capacities of the service providers to deal with climate change and adaptation. With the support of experts from the national level and the project team, the capacity of communes, decentralized government services as well as locally active organisations to address these issues will be strengthened. Specific and targeted training will take place, and direct project support to the planning of the annual adaptation workplans, monitoring and evaluation of their implementation as well as to the local level demonstrations will be rendered.

108. Whilst the NAPA has established a bottom-up and participatory approach to adaptation planning, this LDCF project will be the first direct intervention following up on it, implementing key priorities. The project will establish dedicated adaptation plans at nine pilot communes, which will work together with local communities in putting them into action. The project will support especially nine selected demonstration villages in the four agro-ecological zones in building their adaptive capacities and testing and implementing adaptation measures. Without this project communities will remain unprepared for the

<sup>30</sup> MEPN – PPG 3, 2009.



climatic risks imposed on them and their livelihoods will further deteriorate as they are not able to react to the changed climate patterns. Communes will not include adaptation needs in their regular planning and their capacities remain low to react to the challenge. By establishing pilot projects important tools and adaptation knowledge will be developed that can be up-scaled to and used by other communes and villages in the future. It is anticipated that 7 more villages will then be receiving support once

**109. Co-financing amounts for Outcome 2:**

Cash:	US\$ 536,000
In-kind:	US\$ 5,209,000
LDCF Project Grant Requested:	US\$ 2,288,050

**110. Output 2.1: Nine pilot communes (representing 4 agro-ecological zones) have annual adaptation plans and strengthened CCA support capacity to the community in place**

**Activity 2.1.1:** Establish multi-stakeholder Commune Technical Committees

**Activity 2.1.2:** Prepare and implement annual adaptation plans throughout pilot Communes, including for demonstration village

**Activity 2.1.3:** Organise multi-stakeholder support responsive to CCA plans

**Activity 2.2.4:** Assess CCA capacity of current extension services (Commune and decentralised Government) (SWOT analysis) in 9 pilot communes

**Activity 2.2.5:** Develop capacity strengthening plans (e.g. training on participatory methods, on CC risk analysis and CCA measures, institutional support, incl. support budgets, conflict resolution)

**111. Output 2.2: Nine demonstration villages have increased adaptive capacities**

**Activity 2.2.1:** Develop community CCA approach for project (incl. institution building, capacity strengthening, technical support, etc.) based on initial consultations during PPG phase (see Annex 4)

**Activity 2.2.2:** Each demonstration village develops their CCA plans incl. training components (see Annex 5) (e.g. integrated into Rural Land Plans (Plans Fonciers Ruraux (PFR))

**Activity 2.2.3:** Support implementation of village CCA plans (incl. institution building, capacity strengthening, technical support, etc.)

**Activity 2.2.4:** Develop replication plan for Communes

**112. Output 2.3: Adapted/ climate change resilient production (cultivation, animal production, fisheries) methods are tested in nine demonstration villages and replicated**

**Activity 2.3.1:** Develop and implement Farmers/Fishers Action Research programme for and with demonstration village (based on PPG phase and Annex 4)(incl. improved soil & water management, adjusted crop rotation and cultivation calendars, drought adapted fodder plants, increased production and storage capacities, animal migration plans incl. transhumance planning; sustainable fisheries methods)

**Activity 2.3.2:** Set-up peer learning mechanism within pilot communities and amongst other interested communities (link to outcome 3)

**113. Output 2.4: Networks for production and dissemination of climate resilient short-cycle varieties of key crops in the 4 agro-ecological zones are set up and functional**

**Activity 2.4.1:** Set up a local/commune level system for the production of improved short cycle seeding material, use of certified improved seeding materials, establishment of seed banks of the main crop varieties in each agro-ecological zone, as well as an effective distribution mechanism