

Aide Memoire
Mozambique:
Joint Mission for the Pilot Program on Climate Resilience (PPCR)
November 30 to December 11, 2009
(Draft)

Introduction

1. The Pilot Program on Climate Resilience (PPCR) is designed to pilot and demonstrate ways to mainstream climate risk and resilience into developing countries' core development policies and planning. Mozambique is one of nine countries worldwide and two regional groups selected for participation in the program. The PPCR in Mozambique is to be implemented by the Government of Mozambique with the collaboration of the African Development Bank (AfDB) Group, the World Bank Group and with participation from the International Finance Corporation (IFC), the United Nations Development Programme (UNDP) and other development partners.

2. Following Mozambique's acceptance of the offer to participate in the program in May 2009, a scoping mission was fielded by the two MDBs from July 23 – 29, 2009 to consult with government and key stakeholders on the status of climate risk management in Mozambique. The scoping mission was also in preparation for the joint mission¹ led by the Ministry of Coordination of Environmental Affairs (MICOA). Other members of the mission which was fielded from 30th November to 11th December 2009 were the AfDB, IFC and World Bank with participation from UNDP and DFID.

3. The PPCR is designed to be flexible and to permit investments on the ground to achieve tangible results in areas where there is "readiness for implementation". The PPCR is in two phases. Phase 1 will provide funding and support to undertake necessary works, prior to the design of phase 2. Phase 2 will continue this process and also support on-the-ground adaptation activities. The main objective of the first joint mission is to assist Mozambique in the preparation for Phase 1. The specific objectives of the mission were the following:

- a. review progress in addressing climate risks;
- b. review policies, plans, and strategies and other relevant documents to assess the extent to which they take into account climate risks; and
- c. agree on key steps for mainstreaming climate resilience into core national and sub-national development and key sector strategies and actions.

4. The mission held discussions with a range of Government entities, civil society organizations, the private sector, and development partners (see annex 11 for a description of the consultation process and Annex 12 for a list of people and organizations met). The mission was also able to build on extensive consultative processes that had already been undertaken in previous climate-related analytical and capacity building work, such as the Disaster Risk Management Plan phase 1, a detailed analysis of climate risks undertaken by the DRM agency

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the Disaster Risk Management Institute (INGC), and the National Adaption Plan of Action (NAPA).

5. The team wishes to thank Ministry for the Environment (MICOA) for their support, and those in the Ministry of Planning and Development (MPD), INGC and the Ministries of Agriculture, Transport, Public Works, Fundo de Estradas (FE), CFM and the National Institute of Meteorology (INAMO) for their diligence and assistance to the mission.

6. The highlights of the mission's findings were presented to the Ministry of Planning and Development (MPD) and MICOA at wrap up meetings on 10th and 11th December.

Mozambique Vulnerability to Climate Variability and Change

7. Mozambique is subject to extreme events that take the form of drought, flooding and tropical cyclones. The country's economic performance is already highly affected by frequent drought and flood and rainfall variability (see annex 1). Drought is the most frequent disaster. The National Institute of Meteorology, Mozambique states that the country is affected by drought once every 3 to 4 years. Mozambique has areas that are classified as semi-arid and arid, where rain - even when above average - is inadequate and results in critical water shortage and limited agriculture productivity.

8. Floods in Mozambique are caused by a number of geographical factors, which give rise to high coefficients of rainfall variability. Floods can prevail for several months, occurring most frequently in central and southern regions, along river basins, in low-lying regions, and in areas with poor drainage systems. They are linked not only to heavy rainfall, but also to water drainage from rivers in upstream neighboring countries: waters from nine major river systems from vast areas of South Eastern African region find their way to Indian Ocean through Mozambique. Fifty per cent of the water in Mozambique's rivers originates from outside the country. In 2000 Mozambique experienced its worst floods in 50 years killing about 800 people and displacing 540,000.

9. Mozambique is also subject to 3 or 4 cyclones every year that travel up the Mozambique Channel because of monsoonal activity in the Indian Ocean, particularly in the period of January to March. A regression analysis over the period 1981-2004 suggests that GDP growth is cut by 5.5 percent in average when a major water shock occurs. Assuming a major disaster occurrence every five years, there is an average GDP growth loss of 1 percent per year due to the impacts of water shocks.

10. In national projections, climate change (see annex 1) is expected to increase rainfall variability and the frequency and magnitude of extreme events. The overall impact of these changes on GDP would be substantial, averaging 3.5% of GDP even in the most conservative assumptions on climate change, and as high as 13.6% in the most pessimistic scenarios. Therefore, mainstreaming adaptation to climate variability and change into economic planning could reduce Mozambique's vulnerability to rainfall variability and water shocks. Projections also indicate temperature rises of 1.5 to 2.3 degrees Celsius over the next 50 years, leading to increased evapo-transpiration and more rapid drying and hardening of soils, as well as, when combined with wind events, increased vulnerability of crops, woodland and rural communities to damage from anthropogenically caused fires.

11. At the sectoral level, preliminary analyses show that rain-fed agriculture, coastal towns and transport infrastructure are sectors that are the most vulnerable to droughts and floods (see annexes 2, 3, 4, 5 and 6).

Institutional Context

12. Government has addressed disaster risk (see annex 7) in the Action Plan for the Reduction of Absolute Poverty 2006-2010 (PARPA II). Government is currently preparing the next Five year Development Plan and PARPA III and intends to address climate risk in the programs. Meanwhile, the MICOA has prepared a NAPA (2007) that laid the foundations for a multi-stakeholder adaptation agenda with four priorities: strengthening early warning systems; strengthening the capacity of farmers to deal with climate change; reduction of the impacts of climate change along the coastal zone; and water resources management (see annex 8)

13. INGC and MICOA have recently jointly developed an action plan (called INGC phase II) aiming at: formulating of a national strategy to respond to climate change; development of a systematic focus on climate change for sectoral policies; revision of the legal framework and secondary legislation to adjust fiscal policies; engagement of the private sector in adaptation to climate change (through provision of guidelines for mandatory adaptation standards and requirements for investors); and raising awareness at national, provincial and district levels.

14. The private sector lacks information about climate risks related to their specific investment requirements (see annex 9).

Existing Projects (see annex 10)

15. Denmark, GTZ and UNDP have funded a study on *the impact of climate change on disaster risks in Mozambique* (2009). The Global facility for Disaster Risk Reduction has funded a study on *the Economic Vulnerability and Disaster Risk Assessment* (2009). DFID, Netherlands and Switzerland are currently financing a study on *the economics of adaptation to climate change* (on-going).

16. INGC and MICOA are about to start the implementation of a USD 3 million “Africa Adaptation Programme”, aiming at the institutional strengthening of the Government to manage the climate change agenda, financed by the Japanese Government and managed UNDP. INGC has recently prepared a USD 5 million *Disaster Risk management Plan* aimed at building policy, strategies, and institutions; identifying, assessing and monitoring risks; and reducing underlying risk factors. Denmark, UNDP and France have pledged money to finance part of the *INGC action plan*.

Potential Opportunities for the PPCR in Mozambique

17. Given the institutional context, and existing initiatives and building on consultations undertaken during and before the mission, it proposed integrated spatial approach to climate resilience, i.e. to invest in complementary sectors in targeted geographical areas.

18. In order to address and pilot practical solutions to the three main climate risks Mozambique faces, it is also proposed to invest in the four NAPA priorities (strengthening early warning systems; strengthening the capacity of farmers to deal with climate change; reduction of the impacts of climate change along the coastal zone; and water resources management) in three different pilot poles: the Zambezi basin where the main risk is flood, the Limpopo watershed where the main risk is drought, and the coastal Town of Beira and its corridor where the main risk is cyclones (see annex 11).

19. In addition to these sectoral investments, it is also proposed to improve (see annex the enabling environment for the private sector in four sectors (mining, forestry, tourism, ports and railways) and to build policy and capacity mainstreaming at the national level. The pilot program would thus support capacity building and spatially focused investments in climate mainstreaming on the ground. This would provide lessons for scaled up programmatic investments over time.

Potential Phase 2 Activities

20. The proposed components and activities in phase 2 are summarized in the table below. It should be emphasized that these figures are tentative. Phase 1 will provide an opportunity to prepare rigorous and detailed estimates based on field technical analysis. The figure (US\$ 120 million) also tentatively plan for support from other development partners and is thus greater than the PPCR maximum funding envelop (US\$ 70 million).

21. It should be noted that Mozambique has 55 million hectares of forests and woodlands. Mozambique is engaged in the REDD (reducing emissions from deforestation and forest degradation) process. The main forest degradation issues are caused by poverty related slash and burn agriculture. The community based agriculture/natural resource management interventions in the Limpopo and Zambezi should help directly address this issue, and also provide lessons for REDD implementation.

Table 1: PPCR proposed Phase 2 components

Components	Indicative Activities	Estimated cost
A. Climate resilient agriculture and natural resources lead integrated pilot poles	Control of soil erosion and wildfire, soil conservation, small scale irrigation, water resource management, rural development (including rural roads), early warning systems	Zambezi pilot pole: US\$29 million Limpopo pilot pole: US\$40 million
B. Climate resilient coastal, transport and urban infrastructure protection at Beira	Dune protection, seawall, storm water drainage, climate proofing of transport infrastructure in the corridor	Some US\$23 million
C. Initiatives for private sector	Awareness, access to finance, enabling regulatory environment	Some US\$18 million
D. Policy, capacity mainstreaming and project management and evaluation	Studies, capacity building (including implementation of the strategic impact assessment and initiatives for NGOs), project management, reporting monitoring and evaluation	Some US\$10 million

Potential Phase 1 Activities

22. In line with the proposed components and activities in phase 2, and given existing initiatives, the mission proposes to undertake the following activities during phase I in order to facilitate preparation of phase 2:

Table 2: PPCR proposed Phase 1 activities

Tasks	Already done	To be financed during phase 1	Estimated Cost
Analysis of	INGC phase I, Extreme	Analysis of vulnerability in selected	300 K

Climate Risks	events study and EACC	private sectors and potential adaptation solutions (mining, tourism, forestry, railways, water supply)	
Institutional Analysis	AAP (UNDP)	-	
Capacity Building	INGC phase II	Coordination and management	100 K
Consultation Process	Technical meeting for the evaluation of the African Adaptation Program (May 2009) Consultation for the formulation of INGC Phase 2 (June 2009)	Strategic Impact Assessment	150 K
Knowledge and Awareness Raising	INGC Phase 1, World Development Report 2010	Awareness and communication campaign (NGOs and civil society organizations including private sector, in coordination with PECODA)	100 K
Definition of priority Action Needs, including Investments	NAPA	Preparation of the two integrated rural pilot poles (Zambezi-250k + 350k Limpopo) Preparation of the infrastructure pilot pole at Beira	600 K 250 K

Implementation Arrangements

23. There is still time to decide on the implementation arrangements for PPCR phase 2. (However, in order to minimize transaction costs, the PPCR team will explore to the extent possible the options of building on existing projects through, for example, “additional financing” mechanisms). The mission recommends the following arrangements be adopted for PPCR phase 1. It seems appropriate to build on existing implementation arrangements acceptable to both Government and MDBs. One possibility that might be considered is to use an existing PIU at Ministry of Planning and Development. This approach again would minimize transaction costs, since the unit is already accredited for fiduciary management.

24. To complement this fiduciary arrangement, it is proposed to use MICOA expertise to guide on the technical activities with the support of a coordinator (high level technical expert on climate change) that would be recruited from the sub-region and placed at MICOA, building on the coordination unit from the Africa Adaptation Program.

25. It is proposed that the oversight role be assumed by the Technical Council of MICOA and the Consultative Council of INGC in full coherence with the proposal already agreed for INGC Phase 2 and the African Adaptation Program.

26. The MDBs would continue to engage cooperatively with the Government of Mozambique and other partners through joint missions. It is proposed that the PPCR grant be recipient executed, for example by MPD and signed with one of the MDBs on behalf of the three of them. The detailed arrangements would be specified in the Phase 1 proposal document.

Next Steps

27. Following the signing of the aide memoire the the time-bound next steps to the mission are:

- The grant proposal is prepared by the designated MDB and sent to MPD by January 20, 2010;
- The recruitment process of the technical coordinator starts by January 25, 2010
- The grant proposal is signed by February 15, 2010;
- Follow up activities with the GoM by field officers of their two MDBS (AfDB and WB) to review progress by February 20, 2010 and prepare for the second joint mission;
- The second joint mission takes place in March 2010 to support activities under Phase 1; it will also involve a field trip to define further activities to be financed under phase 2 in the different pilot poles and to conduct further all together stakeholders' consultations.
- Phase 1 program proposal submitted to CIF Admin Unit by mid-April, 2010.

Annexes

Annex 1: Current and Future Climate Variability

Annex 2: Water Resource Management

Annex 3: Natural Resource Management

Annex 4: Agriculture

Annex 5: Transport Infrastructure

Annex 6: Costal Protection

Annex 7: Disaster Risk Management

Annex 8: Institutional Context

Annex 9: Private Sector

Annex 10: Brief description of target areas

Annex 11: Stocktaking

Annex 12: Summary of Consultations

Annex 13: List of Persons Met

Annex 1: Current and Future Climate Trends

28. Historical Climate trends in Mozambique have strong seasonal and spatial variation. Months of high precipitation occur between December and March for all of Mozambique in all provinces. Northern Mozambique (Niassa, CAbo Delgado, Nampula) is historically characterized by 800 to 1200 mm of annual rainfall with little annual variability. Central Mozambique exhibits substantial spatial variability with the Sofala and Zambezia provinces recording up to 1500 mm of rainfall while the Tete and Manica provinces just inland of Zambezia experience around 600 mm of average annual rainfall. Southern Mozambique (Inhambane, Gaza, Maputo) has about 800 mm of annual rainfall and significant spatial variability and inter annual variability.

29. Annual rainfall can range from 400 mm to 1200 mm depending on the location within southern Mozambique. Precipitation variability in the central and south portions of Mozambique appear to be increasing between the 1990's and present time. Absolute rainfall deviations appear to have higher magnitude during these years especially in the southern and coastal regions of Mozambique suggesting that variability may be increasing with time. There has also been an observed increase in annual rainfall in the northern portion of the country during the last two decades.

30. A wide range of General Circulation Models (GCMs) analyzed specific to Mozambique reveal that regional precipitation in 2050 could vary between -30% and +16% relative to historical averages. Inter-annual variability is predicted to increase dramatically as well which suggests that extreme events will become more common which translates into increased frequency of flood and drought periods.

31. Temperature trends have a strong seasonal and spatial dependence in Mozambique as well. The period between October and April is characterized by hot temperatures coinciding with the rainy season and May through September has much cooler temperatures. Minimum average temperatures during the winter months range from 14°C to 22°C country wide with northern Mozambique recording the lowest temperatures. Maximum temperatures can range between 24°C and 32°C during the summer months with the central coast recording the highest temperatures.

32. Inter-annual variability of temperature varies between regions. The northern regions have experienced a relative rise in maximum temperatures since 1990 such that they are consistently over 30°C with little deviation. Inter-annual temperature variability in central Mozambique is historically low with maximum temperatures around 31°C with a sharp increase after 1990. However, this may be due to the increase of meteorological monitoring stations in the area that coincides with same period. A slight increase in the maximum temperature of southern Mozambique has been observed since the 1960's with the average remaining around 31°C.

33. Equally worth noting is the increasing trend in minimum temperatures across the whole of Mozambique. Seasonal variability is narrowing as the average minimum temperature is increasing to around 21°C. This is leading to a decrease in cold days with the average number of cold days and nights per year having decreased significantly since 1960.

34. The future temperature of Mozambique is estimated to increase between 1°C and 2°C by 2050. This coupled with the narrowing of the seasonal and inter-annual variability will greatly increase the potential evaporation year round.

Annex 2: Water Resource Management

35. Mozambique has relatively abundant surface water availability. An average of 217 km³ of surface water runs through Mozambique each year with more than half originating outside of Mozambique². Rainfall is also substantial overall though there are substantial variations. Rainfall in the highlands of central Mozambique is the highest in the country with 1000 mm to 2000 mm of annual rainfall which is partially why the Zambezi Valley is responsible for over half of Mozambique's total renewable water resources (TRWR). The area is home to Africa's 4th largest hydropower dam: Cahora Bassa, produces 66% of the total ground water withdrawals and contains 60% of the irrigable agricultural area.

36. The northern and southern portions of the country have much less surface water potential than central Mozambique and water resources are much less developed. The international basins in southern Mozambique are heavily developed in Zimbabwe, Swaziland, and South Africa and have highly seasonal and unreliable in flow entering Mozambique. Annual rainfall in southern Mozambique is estimated around 500 to 600 mm of precipitation and accounts for about 18% of Mozambique's TRWR. Current surface water storage capacity is relatively small. Annual rainfall in northern Mozambique can be as high as 1200 mm in some areas and 16% of Mozambique's TRWR is generated in the northern basins². Lake Nyasa (Lake Malawi) is a significant source of surface water for the western portion of the region but current surface water storage capacity elsewhere is small. Groundwater use is limited in both northern and southern Mozambique even though alluvial groundwater is relatively abundant throughout.

37. The primary use of surface water in Mozambique is for hydropower and commercial agriculture. Agricultural and livestock withdrawals account for over 85% of the water withdraws in the country taking 550 million m³ per year. The remaining 15% of the water is used for domestic and industrial demands. The Zambezi province contains 60% of the country's irrigation potential but less than 1% of this area is actually irrigated. Southern Mozambique has the greatest need for irrigation and consequently has the most land equipped for it with 76000 ha. However, due to maintenance and operation issues only 30% of this area is actually irrigated. (largescale systems need to be complemented with smaller irrigation and rainwater harvesting systems which may be easier for small farmers to manage. An irrigation investment operation targeted at small farmers is under preparation which will provide valuable lessons in this regard). Northern Mozambique currently irrigates only about 660 ha. Domestic and industrial use is concentrated in urban areas. Currently, 43% of the population has access to improved drinking water supplies, with access being higher in urban than in rural areas.: 2.

38. The port of Beira at the mouth of the Pungwe River 150 kms south of the Zambezi Delta is one of Mozambique's most critical points for the import and export sector. The port is heavily trafficked. The he Zambezi River itself is used to access inland Mozambique. Recent changes in the hydrology of the lower Pungwe , deforestation, tidal surges and rising sea level have began to move the sediment deposit regime upstream of the port of Beira and threatened the navigability of the lower Pungwe.

Potential Climate Effects

39. General circulation models (GCMs) predict a wide range of potential climate futures for Mozambique with rainfall suspected to be extremely variable in the future. The 22 GCMs approved by the International Panel for Climate Change (IPCC) used to predict potential climate futures predict anywhere from a decrease of 31% of the average rainfall over, to a 16% increase

² Irrigation in figures

in rainfall by 2050 compared to historical averages. This means that potential surface water availability is going to be highly variable as well. In addition to the climate variability, changes in management of the upstream portions of the international basins may further exacerbate the variability and could seriously reduce cross-border flows³.

40. Climate predictions suggest that regional climate characteristics are going to change as well. The Zambezi Valley could see as much as a 24% reduction in rainfall by 2050 which would dramatically change the hydrology of the lower portion of the basin and impact rainfed agriculture, woodlands and grazing areas as well as riverine and delta ecosystems. Rainfall potential in northern Mozambique is predicted to decrease in all scenarios with decreases as high as 21% in 2050 when compared to historical averages. Southern Mozambique is expected to see substantial increases in rainfall, even as high as 16% by 2050, presenting opportunities for new water storage and a change in agricultural cropping patterns. Evaporation potential in the entire country is expected to rise as well as most of the country should expect to see a 1o-2o increase in average temperature and therefore further exacerbate surface water runoff changes³.

41. Substantial development of hydropower generation has been planned in Mozambique, especially in the lower Zambezi, but it has all been designed according to historical flows⁴. Preliminary modeling from the Economics of Adaptation to Climate Change (EACC) suggests that climate effects on hydropower might be quite small in Mozambique³. The effects of climate change on water for irrigation and sediment transport were not modeled in the EACC but it is certain that as surface water becomes scarce its explicit use for hydropower generation will become increasingly difficult. Water stress in other sectors (i.e. irrigation and river navigability) will increase the competition for the use of surface water use which could reduce hydropower production, especially in the Zambezi valley where there is already substantial competition for the use of surface water. The tensions will arise around the timing of releases; optimization of releases for electricity may not coincide with optimization for irrigation or navigability.

42. Current surface water storage in northern Mozambique is limited. The Mozambican Generation Master Plan outlines plans for two relatively small reservoirs for in the Rovuma basin in the north but the EACC study suggests hydropower generation will be affected very little. The energy master plan outlines substantial development of surface water storage in the Buzi Basin of southern Mozambique which means it should be well suited to capitalize on the potential increase in rainfall.

43. Decreased rainfall will also result in declining availability of alluvial groundwater and sea level rise will result in salt water intrusion of coastal alluvial groundwater.

44. The energy master plan has outlined generation development for the next 40 years, and hydropower generation has been selected as the primary source of this generation. Irrigation, municipal, and industrial demand has not been significantly considered as a part of this development. This means that agriculture will continue to be closely tied with regional rainfall and changes in future rainfall will result in changes in yield. Land suitability for crop production varies regionally and is crop dependant and future changes are equally variable. Cassava for example, may become less suitable for cropping in Northern Mozambique and more suitable in southern Mozambique⁵. The EACC study suggests that the central and northern portions of the country will see significant declines in average crop production among all crops with southern Mozambique being less affected³. While individual studies suggest different results one thing is

³ EACC

⁴ Generation master plan

⁵ INGC phase I

certain; climate change will most likely negatively affect agricultural production in Mozambique especially in areas that are predominately rainfed.

45. The port of Beira on the mouth of the Pungwe River is currently experiencing changes in sediment deposits. This could seriously affect the navigability of the river and the use of Beira as a port. The port may also be seriously affected by increased cyclone frequency and strength resulting from climate change⁵.

The Potential uses of PPCR Funding

46. Hydropower generation appears to be relatively unaffected by climate change in current studies. This suggests that planners have already incorporated climate variance into the master plan. However, these studies do not incorporate the use of surface water for either irrigation or for mitigating sediment transport problems in the delta. Therefore, it is obvious that PPCR funding should be used to help reduce the impacts of climate change on water resource use for agriculture, municipal and industrial use, and the operability of Beira.

47. One potential solution for the agriculture, municipal and industrial (M and I) water demand is further exploitation of alluvial groundwater and exploration of deepwater sources of water, though the energy costs of operation are a consideration. Currently there is little information regarding alluvial and deep aquifer groundwater availability in Mozambique. The use of alluvial groundwater for agriculture is cheap and effective. The water requires no filtration before agricultural application and pumping costs are relatively inexpensive because less energy is needed to bring the water up to the surface. Exploitation of deep water sources is much more expensive but can be used as a drinking water source because it often times requires little treatment before it is safe for consumption. The salinity of coastal alluvial aquifers will increase as the sea level continues to rise and saline intrusion continues. This means that alluvial groundwater for coastal irrigation will become less usable.

Annex 3: Natural Resources Management

Introduction

48. Seventy per cent (70%) of Mozambique's population lives in rural areas and their livelihood depends mainly on natural resources for subsistence and income (INE 2004/PARPAII). Soil fertility varies widely but land use practices focus on extensive rather than intensive use and do not usually take longer term fertility considerations into account. Forests and woodlands comprise 55 million ha and are the source of 85% of the country primary energy needs (fuelwood and charcoal). They are subject to uncontrolled burning linked to slash and burn agriculture. Fisheries are an important source of employment as well as protein. More broadly Mozambique's watersheds and wetlands provide key environmental services... The Government of Mozambique guarantees the sustainable use of natural resources and the application of transparent mechanisms for the management and rational exploitation of these resources, which include forests, fisheries, water and land resources. The key threats to this sector attributable to climate change include increased fire risk due to increasing temperatures, increasing rainfall variability resulting in more floods in the south and droughts in the north, destruction of coastal wetlands and saline intrusion in river basins linked to cyclones, tidal surges and sea level rise, and increased intensity and frequency of natural disasters.

49. The current Government plans for poverty reduction and sustainable development do not address the risks associated with climate change regarding natural resources.. The plans do not factor in the reduction in the availability of natural resources that is likely to result from climate change. Thus there is likely to be increased stress on these resources with policy implications for the Government. However, the PARPA as development strategy is not be viewed in isolation but alongside specific programmes to address adaptation to climate change such as the NAPA.

50. The NAPA identifies four priority areas three of which have components addressing natural resource management including community forestry management, prevention of soil degradation and water resources management.

Forestry

51. Approximately 51% of Mozambique's total surface land is covered by forests, which are mostly deciduous species. The annual deforestation rate that is directly related to population pressures is estimated at 0.58%. These pressures are likely to be exacerbated by the impacts of climate change. The predicted increased temperatures will potentially impact some forest species that cannot adapt to the higher temperatures resulting in new flora diseases. These species are likely to be replaced by other better adapting varieties. The frequency and extent of destruction caused by the uncontrolled fires is likely to increase due to the increased temperatures. The adverse effects of floods mainly in the southern regions resulting from increased rainfall variability are likely to exacerbate land degradation and deforestation that often result from human settlement and agricultural area expansion. In areas of drought, mainly in the south, there is likely to be loss of vegetation and degraded lands due to increased water stress leading to a more hostile environment for the forests to survive. Coastal areas that have forests such as mangroves will be adversely affected by sea level rise and increased salinity in these areas.

52. As highlighted in the PARPA II, actions are mainly targeted at improving legislation and ensuring its enforcement as well as formalizing land tenure in the sector and establishing systems to enable sustainable use of the resources such as information systems and also oversight of the utilization of the resources. The adaptation options in this sector include: reforestation using

species that will adapt to the climate change impacts; diversification into agro-forestry; controlling the forest fires using fire walls/ breaker zones; improvement of monitoring of potential fire areas; education and sensitization of the populations in forest fire prevention and management of fires; making communities less dependent on charcoal or support to the use of fuel efficient stoves in rural areas; improved fire fighting methods; reinforcement of the species through hybrids.

53. Based on the consultations held with DNTF the PPCR can potentially focus on activities related to:

- reforestation with a regional focus building on activities undertaken by other development partners such as FAO supporting the national forestry management programme. The national strategy on reforestation involves the private sector and will thus also be addressed through the planned intervention in the PPCR targeted at the private sector.
- increasing agro-forestry to contribute to both food security and household income activities while also promoting particular species of trees.
- fire controls that rank very high as adaptation activities including potential satellite imagery to build on existing technology. This component would include capacity building to ensure the upgrading of the technology and its effective use in controlling fires.
- Potentially a special focus on protection of coastal mangrove forests, under PPCR or other programmes.

Fisheries

54. Salt intrusion into inland waters as a consequence of sea level rise will result in degraded productive and natural habitats and the consequent changes in fish species in particular locations e.g. salt-based fish stocks in previously fresh-water fish habitats. The increased frequency and intensity of natural disasters such as cyclones will cause temporary perturbations in the habitat of some of the fish and aquatic species. The wetlands and islands that are important breeding and nursing grounds for some species will be physically affected and even destroyed by these events. The increased frequency of natural disasters will impact on the recovery time of these habitats thus further putting strain on some of the species in addition to the depletion of stocks caused by over fishing. The predicted increase in temperature will indirectly affect the fisheries sector through the food cycle. The extent of this adverse impact will depend on the actual species that are most intensely affected.

55. The current government planned actions in this sector are directed at imposing quotas on endangered species, improving infrastructure and marketing systems and structures to distribute the increased production in non-industrial aqua culture. The possible ways of integrating climate change and thus adaptation include: complementing the fishing with more aqua culture activities, increasing the number of inland dykes to prevent salt water intrusion; addressing soil erosion; developing inland fishing; and improving the fishing gear to ensure sustainable fishing practices.

56. The consultation with the fisheries sector revealed that the climate resilient interventions could focus on:

- addressing soil erosion particularly in habitats that have competing water uses including tourism. Soil erosion control involves water shed management entailing a more cross sectoral and integrated approach to the climate change adaptation.

- promotion of inland fishing through aquaculture development. This component would require some initial activities relating to assessment of inland water quality and also the development of the value chain for inland fishing. The improvement of the value chain includes activities undertaken by the private sector and therefore as outlined in the forestry sector the private sector within the fisheries sub-sector can potentially benefit from the intervention on sector vulnerability assessment under the private sector.

Watersheds/ River Basins: land and water management

57. Climate models forecast increasing temperatures and reduced rainfall in the upstream river basins which provide 50% of the surface water flowing through Mozambique. Water resources are discussed in more detail in Annex 1. Climate models predict increasing incidence of droughts, floods and extreme weather events. Combined with tidal surges and sea-level rise there will be impacts both in the upper and the lower watersheds.

58. Unless there is careful attention to maintaining and restoring vegetation through soil conservation agriculture and improved forest and woodland management, upper watershed degradation will be exacerbated; there will be loss of fertility “in-situ,” erosion and downstream changes in sediment flows. Saline intrusion downstream could lead to loss of delta agricultural lands and alteration of wetlands and ecosystem services.

59. These issues would need careful attention in PPCR programs; it should be noted that there are positive experiences in conservation agriculture and watershed management from ongoing operations, which can be replicated and scaled up.

60. Community participation and benefit sharing is key to success of watershed management programs. PPCR supported measures would need to be designed and implemented together with local populations and decentralized implementing agencies.

61. In summary, sustainable natural resource management approaches are likely to be incorporated into the spatial PPCR programmes and to include an integrated watershed management approach, combining soil and moisture conservation agriculture, agroforestry and improved woodland management including fire management, and erosion control measures.

Annex 4: Agriculture

Sector vulnerability & Gap Analysis

62. Agriculture is a major component of the Mozambican economy employing about 81% of the labor force and contributing about 23.4% to the Gross Domestic Product. As a result of its geographical locations, Mozambique is prone to natural disasters with drought and flooding being the most devastating in terms of the frequency of occurrence and the number of people affected. Despite the nation's endowment with enormous water resources, Mozambique's agriculture is still largely rain-fed, and therefore agricultural performance depends on favorable (or otherwise) rainfall.

63. Although, over 95% of the food crops internally produced in Mozambique are under these rain-fed conditions, when they are linked to crop productivity, average yield per hectare per zone for the major cereal crops (maize, rice, sorghum) as well as cassava, groundnuts and beans, are very low at approximately 1 ton/ha, and show no trends of increasing. Most of the production growth has been primarily the result of increases in cultivated area, rather than increases in yield. This scenario would be exacerbated by climate change and climatic variability.

64. The current low productivity in agriculture has made food security a critical issue in Mozambique. On national scale, there exists a high degree of vulnerability to food insecurity with an estimated 34.8% of total households being regarded as either very highly vulnerable or highly vulnerable. The North Regions are more susceptible to this vulnerability. This also has effects on diet adequacy which is found among households vulnerable to both chronic and transitory food insecurity.

65. Available data has predicted that rising temperatures, longer droughts and more severe flooding will cause continued variability in agricultural productivity. Intensified irrigation demand and human consumption may also lead to the occurrence of water stress. Over all the regions, increases in evaporation will likely be greater than increases in rainfall during the dry season (June-November), which implies that the dry season will become drier in the next twenty-three years and even more beyond. Similar to increases in temperature, the interior regions are likely to suffer greater evaporation increases than those nearer to the coast. This suggests that evaporation will increase significantly in these regions before the onset of rains, which, depending on changes in rainfall, could result in decreases in soil moisture before the main cropping season starts.

66. Estimated figures showed that about 33% of the approximately 76,500,000 ha total land surface of Mozambique is currently being cultivated. But some 25% of the cultivated soils are located in low-lying soils, which during floods are largely inundated. Therefore significant results will need to be attained in increasing yields per ha, but subject to putting in place adaptation measures to counter the effect of worsening conditions of increasing temperatures, rainfall variation and soil degradation. All these are pointers to the vulnerability of the agriculture sector to the climate change.

Indicative areas of intervention

67. In line with the stakeholders' consultations, it is being proposed that PPCR builds upon the initiatives as contained in the Government Plan of Action. PARPA II and Government of Mozambique National Adaptation Program of Action (NAPA). The intention is to mainstream climate change and variability through appropriate actions into the Government exiting plans and programs. Specifically the PPCR may address some of the the following:

- a. Investments in sustainable, small scale irrigation activities to counter the drastic effects of the frequently occurring drought situations to reduce vulnerability of the population to food insecurity. Such investment will include the promotion of good agricultural practices in soil and water management because the causes of drought and desertification are usually both natural and anthropogenic (or human). While the natural causes are climate-driven, associated with the drastic reduction in the quantity of precipitation or changes in the precipitation regimes, the anthropogenic causes include over-grazing, bush fires associated with opening up new cultivation areas, fire wood gathering, charcoal production and the industrial forestry sector. Investment activities will also include the construction of small dams, the use of ground water through the construction of tube wells and wash bores which can be managed at the level of individual farmers;
 - b. Investments in production of good quality seeds which are proven to withstand short term effects of drought and water stress. Since the occurrence of pest and diseases is closely related to the occurrence of drought, such seeds will have qualities that make them pest and disease tolerant while retaining their yield potentials. This component will include support to research into popular arable crops like maize, rice, cassava as well as vegetables;
 - c. Land degradation is a critical issue in Mozambique. The PPCR will promote conservation agriculture especially in degraded areas where over use of land has led to exposure to rain and wind erosion;
68. The programs will also finance investments in storage and preservation infrastructure to reduce the proportion of food produced that are wasted through post harvest losses.
- a) The PPCR will also support agricultural diversification by promoting integrated crop and livestock husbandry at farm family level.
 - b) The program will also promote biofuels especially in arid and semi arid regions.

69. The extents to which these various options are addressed would depend on gap analysis that would be undertaken during the Phase I as well as the availability of funds.

Rationale for PPCR intervention

70. Activities listed for PPCR financing were selected based on the observed linkage of adverse effects of climate change and variability on the agricultural sector. Climatic predictions are that in future, temperature and precipitation are bound to increase as a result of the effects of climate change. These two climatic factors are intricately related to drought and flood phenomena hence the listed activities have thus been carefully selected to ensure that drought and flood effects have minimal effects on the sector through appropriate adaptation activities.

71. Secondly, the activities are to ensure climate related issues are genuinely mainstreamed into normal economic development programs at the national and local level. This will thus catapult climate change issues to the forefront of development agenda.

Annexe 5: Transport Infrastructure

72. Mozambique is heavily dependent on domestic, regional and international transport. The transport sector is the third sector of importance in the economic growth since 2000. Its contribution to GDP is around 10%. Mozambique is a natural gateway for the landlocked neighbouring countries. The transport network, which is still in the reconstruction and rehabilitation phase, is articulated around trade and transport multi-modal (rail, roads and ports) corridors (national and international). In the North the strategic Nacala corridor connects to Malawi. In the central region the Beira corridor provides access to Zimbabwe but also goes through the rich Zambezi Valley via the Sena sub corridor giving access to Malawi. And in the South the Maputo Corridor gives access to South Africa and Zimbabwe.

73. The prevalent mode is the road mode. There is a network of some 30,000 km of classified primary, secondary, tertiary and local roads, 80% of which are still not paved, and some 3,000 km of urban roads. Private sector involvement in the transport sector and in management of transport infrastructure and assets has become gradually more important and while the road network is still mostly a public sector network, the port and railway operations have been gradually transferred to the private sector. These two subsectors, as well as the air and river modes, will be mostly dealt within the Initiatives for Private sector and Enabling Environment component.

74. In large areas of country, whose coastline stretches 2500 kms, transport assets are vulnerable to extreme weather events, especially during the intense rainy season and the cyclonic period. These assets can be affected along the coastline but also in the interior, being exposed to frequent wash-outs, floods, local inundations and recurrent land-slides destroying part of the roads, tracks, and causing extensive damages to bridges, culverts and drainage systems. With the increasingly frequent and severe extreme weather events that climate models predict, transport assets will become more vulnerable, in particular road assets.

75. The most common and frequent natural disasters the road sector has to deal with are floods, local inundations and mudslides, and along the coastline sea level surge which are likely to represent a growing threat in the future. These events not only prevent use of the road temporarily (ie during floods) but also damage and destroy portions of the roads, cutting access. Provisions to tackle with direct impacts from floods exist and have been implemented for some years already but climate risks and resilience concerns are not integrated into transport infrastructure strategy, planning and investments neither at national nor at provincial levels. For example, the second road strategy and policy documents of the Ministry of Transport, the Road Fund ANE (National Road Authority) while they deal with some measures dealing with climate impacts do not address climate change and resilience in the medium and long-term.

76. To do so in Mozambique, interventions at multiple levels would be required. The PPCR may support a number of priority interventions such as the ones below, while ways to address, properly and in a cost effective way, the impacts linked to extreme climate events still need to be revisited and adapted to the ongoing situation as well as the estimated evolution in the near future due to climate change.

77. Proposed activities include: : (i) updating strategies and guidelines of the Ministry of Public Works, Ministry of Transport, Road Fund, ANE, CFM and private sector entities involved in the transport sector to address climate resilience and extreme climate events; (ii) building institutional and technical capacity in relevant agencies to analyze and define most adapted ways

to integrate climate risk and resilience in infrastructure design, development, operation and management (including legal issues, insurance and compensation matters, concession, BOT and PPP agreements); (iii) preparing technical specifications and standards for transport infrastructure projects to include specific climate change and resilience aspects adapted to Mozambique;; (iv) improving road data to record and flag road sections at risk from flooding and other climate related events to prioritize parts of the network at greater risk than others; and (v) revisiting least cost road designs to assess the most cost effective balance between climate proofing investments compared to repair programs to deal with extreme climate event impacts (iv).

78. There is a real need for a medium and long-term strategy to make critical infrastructures, in particular roads more climate resilient. The current systems are inadequate to deal with future climatic and environmental challenges. International Trade and Transport corridors must be protected through adapted and cost effective climate-proofing measures and/or fast track repair programs to address extreme climate events impacts. Analytical work ongoing on transport and climate change supported by the World Bank is intended to provide strategic guidance in this regard.

79. Due to limited funding, and the need to pilot results on the ground and test the “replicability and scalability” characteristics of the PPCR, two pilot poles have been identified (in the Zambezi Valley and the Limpopo water shed areas) where an integrated approach (agriculture, natural resources, transport infrastructure, pilot climate proofing of dwellings and establishment of safe havens) is envisaged...see para xxxxxgiving the description of the two areas. A third pilot pole could be envisaged at Beira because of its specific vulnerability to sea surges.

Proposals for Phase 1 and then implementation during Phase 2

80. At this stage it is proposed to develop two to three pilot pole programs: (i) one in the Zambezi Valley area; (ii) in the Limpopo area, to be carried out, in an integrated approach and in total coordination with proposed Agriculture Climate resilient component. Some of the activities identified could include:

81. During Phase 1 for an amount estimated to some US\$ 600,000

- A screening and areas confirmation to delimit the two pilot pole program areas in conjunction to the climate resilient agriculture component in the Zambezi Valley (US\$250,000) and Limpopo water shed (US\$350,000);
- For each of the pilot pole, definition of an integrated action plan including a combination of specific investments, capacity building activities, complementary studies and technical support needed; including a study to assess and evaluate (cost benefit analysis) appropriate types of road maintenance and repair techniques within a full scale pilot operation including field trials on primary, secondary tertiary as well as urban roads (paved and non paved); as well as the most appropriate monitoring and evaluation system design and process to be followed.
- All the preparatory tasks (fiduciary, institutional and ESIA in particular) to be carried out before Phase 2 can be implemented.

82. For the Beira pilot pole, a feasibility study (for some US\$250,000) of the climate adaptation of the international Beira multimodal corridor (port, railways and road) based on its climate change vulnerability scoping and assessment.

83. For Phase 2 and for an amount estimated to some US\$5-7 million per year for a period of some 4-5 years for a total of US\$25-35 million per pilot pole:

- conduct full-scale pilot field trials in both pilot poles identified (areas proposed will be confirmed during Phase 1) on primary, secondary and rural roads and develop adaptation-oriented engineering specifications and strategies and/or guidelines for best practice, and
- Integrate into the new Road Sector Strategy and next 3-5 year investment program;

Annex 6: Coastal Protection

84. Mozambique's coastal areas are key to the economic well-being of the country. 60% of the population lives within 50 kilometers of the sea. The country's 2,500 kilometers of coastline include the capital Maputo, the major port city of Beira, gateway to Malawi and Zambia and a number of lesser cities. The lower river basins are fertile and densely populated. Mozambique's fisheries are important economically and provide a key source of protein to the population. The coastline harbors unique ecosystems, but also plays an essential role in protecting areas inland from sea surges and saline intrusion. Its natural beauty forms the basis of a growing tourism industry.

85. The coastline consists largely of low-lying beaches and sand-dunes which form a natural barrier to the sea, broken however by river mouths and estuaries. These coastal areas and lower river basins are vulnerable to flooding and saline intrusion from tropical cyclones, sea-surges and heavy rainfall events. There are significant regional differences in vulnerability, and differences within regions, depending on topography, tidal patterns and hydrology as well as the extent of urban development. The INGC study has prepared an analysis of coastal vulnerabilities which classifies the coastline into three broad regions.

86. Broadly, the Northern Region is relatively resilient. It is characterized by a narrow coastal plain with few large rivers, a coastline of sandy beaches, sea grass meadows and fringing coral reefs, and a narrow continental shelf. The tides are moderate (2 meters in range) and the coast is subject to occasional tropical cyclones. Over 200,000 people were affected by cyclone Jokwe in 2008, which damaged roads and other infrastructure. While analysis indicates that at least for the next 30 years the current defenses of the northern towns are sufficient, the coastline is vulnerable to the expected inundation of a system of intertidal bars comprising coral rubble, which provide protection from wave attack. Even with a modest 30 cm sea-level rise erosion setbacks of 30 meters would be prudent. Some small low-lying islands are highly vulnerable. New tourism and other developments would need to take this into account.

87. The Central region is characterized by a wide and flat coastal plain, with many large rivers and deltas, a dynamic sediment-rich muddy and sandy coastline and wide, shallow off-shore tidal flats. The tides are large (up to 7 meters in range) and the coast is the most subject to tropical cyclones. Beira and the mouth of the Zambezi are located in the Central region. Beira port and the lower lying areas of the city are particularly vulnerable. The present seawall is built only to 3.4 meters, a one year return period, and seawater spills onto the road and through the fissures of the wall protecting the port every year. Flooding is more extensive at the current 10 year return period of 3.9 meters. (only 50 cms above the current one year return period). There is also a vegetated dune barrier to the east of Beira which provides protection and may need to be reinforced. Preliminary analyses have been conducted on the extent of flooding under 10, 100 and 1000 year return periods with different levels of sea level rise. Reinforcing the protection of Beira is a priority even under the most conservative assumptions; more extensive analysis and feasibility studies are necessary to assess the cost-effectiveness of different levels of protection, taking into account the combined effects of sea-level rise, storm surge and tides. Such an analysis should also compare protection costs with the costs of moving parts of the city, "managed retreat", and addressing the damage caused by storm events. In all cases these measures should be combined with land-use planning and public awareness efforts by the municipality to control new development on the at-risk areas.

88. The Southern region has a narrow coastal plain, some large rivers, a sandy coastline, and a shallow bight in Maputo Bay. The tides are moderate (2 meters) and the coast is subject to

occasional tropical cyclones. In Maputo town even under the most conservative climate change scenarios the developments along the coastal strip are at risk; ideally there should be tight controls on new large-scale developments here.

89. More broadly, agricultural land in the delta areas and lower river basins is likely gradually to experience increasing saline intrusion; and a number of towns are experiencing increasing groundwater salinity. There is a need for dissemination of existing knowledge about trends regarding these issues, so that local actors and decision-makers can plan accordingly.

90. Planned tourism facilities along the coast need to take into account the expected impacts of tidal surges and other extreme weather events. There is some information about the geographical distribution of the most vulnerable areas, and MIKOA has recently commissioned a strategic environmental assessment of the entire coastline. But information also needs to be tailored to private sector actors and disseminated.

91. Mozambique's coastal protection requirements are extensive. Given limited resources, the need to focus and to move ahead with priority actions while undertaking longer term strategic analysis, the PPCR proposes the following short term and longer term actions:

- Under Phase 1 further analysis of cost effective alternatives for protection of Beira City and port (US\$ 300,000), for financing under Phase 2 (initial cost estimate US\$20 million).
- Under Phase 2 feasibility studies for protection of the low lying area of Maputo, and detailed land use mapping of vulnerable areas of the coastline (US\$ 1 million).
- Integrating in the spatial pilots the construction of “safe havens” in the case of extreme weather events, as well as supporting construction of cyclone-proof housing and social infrastructure in the most vulnerable areas. These activities would be undertaken by local communities in close collaboration with district authorities, building on Mozambique's decentralized government system.

Annex 7: Disaster Risk Management

92. Because of its geographic localization and its topography, Mozambique is exposed to a wide range of natural hazards such as floods, cyclones and drought. While flood events occur every 2-3 years, cyclones occur with a frequency of 1-2 in 4 years and drought with a frequency of 4-7 in 10 years. In addition, Mozambique economic vulnerability to natural hazards has been classified as very high, in the worst 25% of the world; and as much as 25% of its population is at risk from natural hazards. This combination creates the scenario for regular and violent catastrophic events. During the past 50 years, the country has suffered from 68 natural disasters, which have killed more than 100,000 people and affected up to 28 million. Mozambique ranks third amongst the African countries most exposed to risks from multiple weather-related hazards⁶.

93. As indicated in recent study conducted by the National Disaster Management Institute (INGC), because of climate change, the exposure to natural disaster risk in Mozambique will increase significantly over the coming 20 years and beyond. Indeed, based on observed trends and future scenarios, this study predicts that flood risk will increase, notably in the south, and that there will be likely shifts in the rainfall patterns, with retarded onset of rainy seasons, wetter rainy seasons and drier dry seasons. It is also expected that by 2030, more severe cyclones will

⁶ 2009 Global Assessment Report on Disaster Risk Reduction, UNISDR, 2009.

pose the biggest threat to the coast, notably in the centre of the country. In addition to exposure, vulnerability is expected to increase over the next two decades, as climate impacts reduce peoples' livelihood assets and impinge on food production, thus undermining Mozambique's capacity to reach the overarching goal of reducing extreme poverty⁷.

94. Following the devastating floods of 2000, the country has initiated a reengineering process of its disaster management system, moving from a reactive to a more proactive approach. After restructuring the INGC and creating a new institutional framework, in 2006, the government approved a 10-years master plan for natural disaster prevention and mitigation, as part of its poverty reduction strategy. The main objective of this master plan is to reduce the number of human victims and loss of property, while developing a culture of prevention. Following a multisectoral and integrated approach, the plan is articulated around 3 main strategic lines: (i) drought mitigation and the control and prevention of floods, (ii) the reduction of food insecurity in arid and semi arid zones; and (iii) the development of an operational Emergency Management System, with early warning and information management capacities and disaster preparedness and response (including Search & Rescue) capabilities

95. Synergies between Disaster Risk Management and Climate Resilience have grown during the past 2 years. Indeed, the National Action Plan for Adaptation to climate change (NAPA) has identified the need of strengthening early warning system as the first priority for intervention. INGC has identified the need to move towards a more integrated climate risk management approach, ranging from preparedness and disaster mitigation to broader adaptive activities, and taking into account the changing pattern of natural hazards in its disaster risk management planning process. In its recognition that climate resilience is not just about the far future, the INGC also wants to accelerate the implementation of corrective disaster risk management activities, addressing actual risks that are already well consolidated.

96. One of the key elements of an effective disaster risk management system, is the capacity to generate and disseminate relevant climate related warning information in a timely manner, to enable individuals, communities and organizations to prepare and to act appropriately and in sufficient time to reduce the possibility of harm or loss⁸. While Mozambique has already some early warning elements in place, they are not integrated in a single system. In addition, there are some important gaps in the coverage of hydro meteorological monitoring systems and in the dissemination of warnings to end-users, such as vulnerable communities. Building on the existing monitoring and forecasting monitoring capacities within the National Meteorological Institute (INAM) and the National Water Department (DNA), it is important to develop integrated EWS in key river basins, with a geographical focus on the Zambezi and Limpopo basins, covering not only rapid-onset hazards such as floods and cyclones, but also slow-onset hazard like drought. Besides, this people-centered kind of early warning system should be tested regularly through simulation exercises, to evaluate all steps from hazard detection to community response.

97. In addition, because of the rapidly evolving configuration of climate risks in Mozambique, the country needs to create an information system which integrates information on climate hazards (cyclones, floods and droughts), their expected changes in the future, as well as information related to both physical and social vulnerabilities (roads, infrastructure, poverty

⁷ Study on the Impact of Climate Change on Disaster Risk in Mozambique: Synthesis Report, INGC, June 2009

⁸ Terminology on Disaster Risk Reduction, UNISDR, 2009

levels, sector dependencies). This system, of dynamic nature, will facilitate the continuous update of the risk information, which is at the core of any disaster risk management intervention.

98. Finally, because of the likely increase of frequency and intensity of natural hazards, Mozambique will need to upgrade its emergency response system well beyond current preparedness levels. This would include the revision of risks maps and evacuation roads, the expansion of Emergency Operation Centers at district levels, and strengthening of community resilience through enhanced capacity development of local risk management committees. In addition, although some elements are already considered in the current master plan for disaster prevention and mitigation, there is a need to better integrate climate change projections in the revision of building norms and standards, and in the development of a climate risk management financing strategy.

Annex 8: Institutional Context

Policies and Planning

99. Government's Five Year Plan and PARPA II (Poverty Reduction Strategy Paper) acknowledge the role of good environmental stewardship in poverty reduction, but they have not been explicit in articulating climate change, its impacts and how adaptation should be addressed. Nor do they address the weak implementation capacities in technical ministries to overcome them. Government has however addressed disaster risk in PARPA II. Government is currently preparing the next Five year Plan and PARPA III and intends to address climate risk in the programs.

100. In recognition of the risks imposed by climate change to the country's development, the Environment Ministry, MICOA has prepared the NAPA (2007) that laid the foundations for a multistakeholder adaptation agenda. More recently, the National Institute for Disaster Management (INGC) has undertaken a programme aiming at formulating a more comprehensive National Strategy for Adaptation to Climate Change. This programme (so called INGC phase II) was formulated following a compelling "Study on the Impacts of Climate Change for Disaster Risk Management" (so called INGC phase I). It will produce a more comprehensive multisectoral climate risk vulnerability assessment, and will result in a set of recommendations to "climate proof" the country's future development.

101. Putting recommendations into practice and reflecting them in sectoral and local plans and budgets will not be automatic. Often, line Ministries do not yet fully recognise the climate change risk imposed to their sectors, do not realize the adaptation costs and have not yet developed plans to "climate proof" their strategies.

102. Issues of institutional coordination are currently impinging on quick action to be taken. For example MICOA is tasked with environmental policy coordination and has prepared the NAPA, whilst INGC coordinates disaster risk reduction (including climate risk management). MICOA also represents the Government in UNFCCC processes. There is a potential overlap in policy coordination between the two concerning climate change adaptation institutions, which rightfully interfaces with the mandates of both institutions.

103. In addition, decentralized plans and budgets at provincial and district levels are not yet environmentally compliant nor are they climate proofed. Given the relevance given by the Government to the districts as "polo de desenvolvimento", and the importance of land planning at local levels for adaptation strategies, climate risk managers need to address the opportunities and challenges that decentralization poses in Mozambique's development planning processes.

104. Despite the roll out of some plans to address the climate change agenda at the central level and at high levels of decision making, at the sector level nor at the decentralized level of government, few policy makers, planners and technical staff have the knowledge, skills, and guidelines or tools to assist them in the implementation of climate change adaptation measures. Some operations are however addressing capacity building at the local level (for example the *Zambezi smallholder agricultural project* which is helping district staff and farmers plan and implement climate resilient land management approaches). Such approaches need to be scaled up.

105. Leadership, management, planning and budgeting skills are inadequate amongst the technical ministries on how to integrate recommendations from climate risk assessments in their planning, budgeting and implementation strategies. The Ministry of planning (MPD) and the

Ministry of Finance (MOF) particularly have no experience in mainstreaming climate risk management in government planning at national and the decentralised levels.

106. While the existing legal framework provides for inter-institutional coordination, there is no institutional culture that focuses on adaptation as an intersectoral matter, which covers both the public and private sector. At the same time, clear leadership in the implementation of adaptation measures must be established.

107. Existing technical and coordination councils should be made use of rather than establishing new government coordination mechanisms. Implementation of climate resilience measures needs to be mainstreamed into the budgets of the responsible agencies (eg municipalities, transport agencies) or actions of citizens (eg farmers, private sector operators) at all levels.

Leading institutions for climate risk management and adaptation

MICOA

108. The Ministry for the Coordination of Environmental Action (MICOA) was created in 1994 with the mandate to (i) coordinate the sustainable development process, harmonizing the plans and programmes of all stakeholders in the exploitation, use, protection and management of natural resources; (ii) develop appropriate policies and laws that will ensure the sustainability of these resources; and (iii) develop public environmental awareness and culture in Mozambique. MICOA is a coordination body, not an implementing one.

109. The structure of the Ministry includes a Technical Committee and a Consultative Committee where the projects, programmes, strategies, and annual strategic plans and new laws to be implemented by the Ministry are discussed, approved, and revised. These bodies meet on a regular basis.

110. MICOA hosts the secretariat of the Council for Sustainable Development (CONDES). This organ has Minister level representation, is normally chaired by the Prime Minister and meets once a year for a follow up of policies and strategies at the national level with a potential impact or benefit to the environment and the path to national sustainable development.

111. In its capacity self-assessment report, MICOA acknowledges: "a general shortage of information related to environmental management in a format that can be readily understood and used by the main stakeholders in the country. This weakness is exacerbated by the weak coordination among institutions involved in producing and archiving environmental information at national level."

112. The Ministry is also experiencing difficulties in following the adaptation to climate change agenda due to scarce human resources allocated to this area. Support to institutional capacities of MICOA in the area of climate change will improve in 2010 through the recruitment of an international technical advisor facilitated by UNDP through the Africa Adaptation Programme.

INGC

113. INGC was created in 1999 as a public institution endowed with legal personality and administrative autonomy. Its mandate is to direct and coordinate disaster management at the national level, especially concerning prevention and mitigation activities, as well as assisting disaster victims. This Institute is under the Ministry of State and Administration (MAE). Since 2005, the INGC went through a restructuration process that "elevated" the statute of the institution. INGC is now managed by a General Director, appointed by the Council of Ministers.

114. Mozambique has a good coordination framework on disaster management issues, with the existence of a Coordination Council for Disaster Management (CCGC) comprised of

Ministers, chaired by the Prime Minister, and the Technical Council for Disaster Management (CTGC), comprised of representative from the line ministries, chaired by INGC General Director. The CTGC is used by INGC as a forum to review on-going disaster response and prevention intervention in the country, in partnership with the UN country team, humanitarian organization and other partners working in disasters field.

115. INGC has proved its capacity to develop project proposals and mobilize funding. The institute developed an excellent Project Document for the Phase I of their Climate Change Study (for which they have mobilized more than US\$ 400,000 from donors) and they are now proceeding with the Phase II proposal of US\$ 4 million. Every year, INGC reports on the implementation of the Annual economic and social plan (PES). The reporting on PES implementation is shared with donors and is the basis for the development of the annual joint review.

116. INGC currently employs 158 civil servants (for a total of 380 posts requested), mostly administrative staff. The institute has a number of technical staff working under projects. INGC plans to recruit and train more technical staff for their planning and disasters management operations. Technical trainings so far have received program support from GTZ, OCHA, UNDP, INWENT and national agencies such as UEM, UDM, Institute of public administration.

National initiatives

117. A number of climate risk management and adaptation interventions are underway in Mozambique, with an influence in the institutional framework. For instance, on the UN side:

- The “Africa Adaptation Programme”, aiming at the institutional strengthening of the Government to manage the climate change agenda, formulated by UNDP and endorsed by INGC and MICOA (see annex I).
- The “Joint Programme on Strengthening Disaster Risk Reduction and Emergency Preparedness”, convened by UNDP.
- The “Joint Programme in environmental mainstreaming and adaptation to climate change in Mozambique”, implemented by six UN agencies and several government institutions (MINAG, INGC, INAM, MICOA).

118. On development partners’ side, an active environment donor coordination group exists, aiming at harmonizing support to Government on environmental issues in general and encompassing climate change portfolios. The World Bank is currently undertaking critical analytical study to identify the costs and financial needs for adaptation to climate change. The French cooperation conducted a study on the economic costs of environmental degradation in Mozambique, with references potentially relevant to adaptation. Other development partners like the Swedish, Danish, Norwegian development agencies, GTZ and the EC are also supporting environmental interventions both in Mozambique and regionally, which relate directly or indirectly to climate change on both adaptation and mitigation portfolios.

119. Although the civil society in Mozambique is generally weak, there are various NGOs addressing climate change through specific pilot activities. WWF is linking its forestry activities to mitigation and mainstreaming adaptation into all their project activities. IUCN has several adaptation pilots at community level in the Gaza Province and has prepared awareness raising materials on climate change.

120. The most significant ongoing activity on institutional and capacity building for climate risk is the programme so-called “INGC phase II”. Led by INGC, a multi-stakeholder task group, has coordinated the development of this initiative, based on information from study on the Impact of climate change on disaster risk (INGC Phase I). MICOA has been recently involved in

the management of this initiative. The programme is receiving support from UNDP through the Africa Adaptation Programme (see annex I), and from DANIDA. Other partners such as AFD and WB have showed interest in providing further financial assistance.

121. The main components of “INGC Phase II” are: formulation of a national strategy to respond to climate change; development of a systematic focus on climate change for sectoral policies; revision of the legal framework and secondary legislation to adjust fiscal policies; engagement of the private sector in adaptation to climate change (through provision of guidelines for mandatory adaptation standards and requirements for investors); raising awareness at national, provincial and district levels.

Annex 9 : Private sector

122. Currently there is little consideration of climate change and its impacts in the decision making process of the private sector in Mozambique. One of the conclusions of the discussions held during the consultations (see Annex 9) with the private sector stakeholders is that there is very little knowledge or awareness on the climate risks and impacts and how will these affect specific sectors and that, therefore, it is not possible to make decisions about specific adaptation priorities or activities without the necessary information.

123. The participants expressed the need for elaboration of the necessary information about sectoral risks and impacts from the specific private sector perspective, appropriate and specific adaptation options, and adequate dissemination of relevant information. Additionally, the consulted stakeholders communicated the need for consideration of incorporation of climate change considerations to policy and regulations, insurance products, as well as creation of appropriate incentives that would enable increasing climate resilience.

124. The need for enabling the private sector to take appropriate decisions that consider climate change is particularly relevant in the face of pipeline investments that include a number of long-term projects, including key infrastructure, evidence of severity of impacts that climate events had in the recent past, and future climate projections.

125. Given the expressed gaps and needs, and in line with PPCR's Programming Modalities, Phase I will analyze risks and impacts to priority sectors recognized during the consultations (ports and rail, urban water supply, tourism, forestry and mining), identifying priority initiatives to be included in Phase II of the Program. This work will be done in coordination with related ongoing national initiatives (INGC's Phase II).

Annex 10: Stocktaking of past and ongoing CCA activities and main lessons learned

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Annex 11: Brief Description of Potential Climate Resilience Poles

1. Limpopo

126. Mozambique shares the Limpopo basin with three other countries, namely, Botswana, South Africa and Zimbabwe, and it hosts 19.3% of the total basin area. In the Limpopo basin, drought is the most common and devastating natural hazard affecting the livelihood of the population. The Chicualacuala District, in the Province of Gaza, is the geographical entry point of the Limpopo Basin into Mozambique.

127. The Limpopo River has 4 effluents: the Munene, Nuanetzi, Chetu and Singuedzi rivers. The flow rates vary considerably during the year and the basin area experiences increasingly frequent and severe climate related disasters in the form of droughts and occasional floods, which have serious negative consequences on the livelihoods of the people living there. According to INGC, on a scale of Very Low-Moderate-Very High Drought Hazard Index (DHI), Chicualacuala has a high DHI. Consequently, there is a high chance of crop failure and/or

agricultural production variation due to erratic rains that occur only a few days during a 2-3 month period.

128. A severe drought in 1991-93 affected 1.32 million people throughout the whole country. The Limpopo Basin faces droughts regularly, such as the 2002 drought that affected some 43 districts in the South and Central Provinces. The flow of the Limpopo River is irregular during the dry season and it comes close to drying out upstream. Occasionally, heavy and excessive rains may occur and the water level of the Limpopo River rises. The severe flood of 2000, caused by unusually heavy rainfall and the additional burden of three cyclones, killed 700 people, affected 2 million people along the main branch of the Limpopo River. For instance,, about 90 percent of the population of the Chicualacuala district (one of the worst affected areas by the drought) lives in poverty, thus not being able to meet their basic food and non-food needs.

129. A land suitability map indicates several constraints for agriculture, with most of the area classified for pasture and forest, and small patches for agriculture with low productivity. The suitable areas for agriculture/livestock are situated at the eastern boundaries, which may receive some rains during the winter. Along the river there are 90 000 ha of potentially suitable land for irrigated crop production, yet to be properly exploited rainwater harvesting techniques and investments in efficient irrigation systems will be required. Given this situation, livestock production/animal husbandry and wildlife game farming (60% of the Limpopo National Park forms part of Chicualacuala district) might offer the predominant opportunities for development to improve and diversify community livelihoods. Logging, harvesting of wood for poles, firewood and charcoal are the main non-agricultural income generating activities.

Limpopo: PPCR Agricultural Pole

130. An evaluation of climate change impact on livelihoods (crops, forestry, livestock, water, etc.) will be undertaken in order to determine the levels to which these livelihoods are vulnerable to adverse climatic events. Options for livelihoods diversification will then be identified through a participatory mechanism with local communities.

131. The Limpopo is an integrated adaptation demonstration project that can be built on the existing AfDB Masingir dam project. Currently the Bank is financing the repairs caused by the damaged to the bottom outlet and this expected to ensure the efficient utilization of the water in the Dam for irrigation down stream. Recent consultations with the Ministry of Agriculture showed that the drought mitigation and adaptation approach for the Limpopo basin would be to develop an irrigation network of irrigation facilities to tap in water from the Masingir dam. Also in our discussion with SETSAN the Limpopo basin has also been identified as a weak and vulnerable link in the food basket chain in the southern part of Mozambique with considerable threats of food insecurity. The proximity of Maputo, the capital, to the Limpopo makes the Limpopo basin an excellent supplier of food commodities if an adaptation project is introduced.

132. Among the adaptation concepts to be applied and because of the short duration of the agricultural growing season, it is imperative to introduce short-cycle varieties and techniques for moisture and agriculture conservation, in order to enhance household food security for the rural population.

133. In order to address the needs of the people in the Limpopo basin, and taking account of its current climate vulnerability, it is important to (i) identify and map the zones that are likely to be most affected (ii) reinforce the mechanism to forecast the occurrence of climate-related events thus the installation of agro- met stations (iii) embark on integrated activities that increase the resilience of communities, and (iv) incorporate climate change adaptation into strategies, policies and development sectoral plans (agriculture, land use, infrastructures, irrigation, etc..). Some of

the specific actions include increasing water quality and supply for different purposes; increasing livestock production and milk supply; planting indigenous and exotic trees with a view to improve the fodder supply and protect crops against wind and heat; introducing drought-resistant crops; constructing and using small-scale irrigation systems and appropriate water management techniques; building compost plants to diversify the supply of organic fertilizers thus reducing the chemical fertilizers bill and increasing the production yield per hectare by improving soil conditions; encouraging milk processing; establishing an accessible financing mechanism; and promoting developing markets for agricultural products. All of these will need to be implemented in a manner that improves gender equity, empowers women, and builds the capacity of local communities to bargain and negotiate their terms of trade and diversifies and sustains their livelihoods.

134. Thus, the Limpopo Adaptation Project (LAP) may include three components:

- A “hard” adaptation component setting up an irrigation network of drip stations;
- A “soft” adaptation component consisting of: crops modeling; small scale irrigation; small scale holders conservation farming; construction of compost plants and organic fertilizers from rural cities’ solid wastes; animal husbandry and biogas household digesters for production of electricity for cooking; reforestation and afforestation and woodlands management; and erosion and soils management;
- Project management, capacity building and monitoring and evaluation.

Way Forward

135. During the next mission in March 2010 the range of feasibility studies will be defined, firstly, to identify the livelihood diversification options available, and subsequently, to establish priority alternatives that ensure the enhancement of the quality of life and increase the income generation capacity of the communities benefited and fulfill the objectives of guaranteeing food security and poverty reduction. Lessons learned from previous programmes in the Limpopo basin will be addressed, particularly from the Joint Programme with the FAO as the technical coordinator (2007-2009).

2. Coastal Protection: Beira

136. Beira, in the province of Sofala in Central Mozambique, has a population of about 500,000 and is the third largest city in the country. It is a major port and gateway to Zimbabwe and Zambia. Central Mozambique has high tides (7 meters) and is especially vulnerable to tidal surges associated with tropical storm events. The port area is liable to flooding and is protected by a sea-wall, which, however, is inadequate to deal with increasingly frequent high water events. Even the most conservative climate models predict that the wall will need to be raised. The port itself requires frequent dredging, because of sediment flows from upstream combined with tidal surges. The low lying areas of the city are also liable to flooding by high water in the estuary. To the north, vegetated dunes provide some protection.

137. Given the importance of the city and its vulnerability, it has been selected for implementation of pilot investments under the PPCR. PPCR would support feasibility studies and strengthening of the sea-wall (probably with a 30 year time horizon) after economic analysis of various medium and long term options. It would support cyclone proofing of buildings in vulnerable areas, as well as construction of safe havens if needed. Further support to drainage and flood management within the city may be needed depending on other sources of financing.

3. The Zambezi Basin

138. The Zambezi Basin is home to 5 million people, one-quarter of Mozambique’s population. With 5.5 million hectares of arable land it accounts for 15% of the country’s total

arable area. Hard-hit by the war, recovery has been impressive but many areas still suffer from poor access and high levels of poverty. Access to improved agricultural inputs is limited; only 4% of farmers use fertilizer and 10% animal traction. Hence agricultural and woodland land-use practices are extensive, exposing soils to erosion and with widespread seasonal burning. 60% of Mozambique's irrigable area is in the Zambezi Valley but apart from some small-scale NGO-led interventions, initiatives to promote irrigation have so far had little success. Despite recent progress Mozambique's rural roads are underdeveloped and many are impassable in the rainy season.

139. Central Mozambique is highly vulnerable to climate variability and change, and droughts and floods are exacerbated by the pressure on ecosystem services from current land-use practices. Rainfall varies substantially within the basin, with Sofala and Zambezia provinces recording up to 1500 mms of rainfall while rainfall in Tete and Manica averages 600 mms. Climate models predict increasing variability of rainfall in the region, and incidence of both floods and droughts in the basin. Summer temperatures are the highest in Central Mozambique, and temperatures are predicted to increase by 1 to 2 degrees Celsius by 2050. Models also indicate that the sectors most affected are agriculture, road infrastructure and coastal developments. Developing climate resilient agricultural and forest land-use practices and investing in climate resilient road infrastructure is thus key to the economic well-being of the population of the Basin.

140. Mozambique as the downstream riparian of the Zambezi, is vulnerable to the impact of land and water management practices in the upstream countries. Deforestation upstream has contributed to the frequency and severity of flooding downstream. Within Mozambique The Cahora Bassa dam and its reservoir, developed for hydro-electric power, also influences flows downstream. There is much however that Mozambique can do within its borders to improve land-use practices and make its population more resilient to climate variability and change.

141. The Valley is already participating in a World Bank and GEF supported program for market-led small-holder development, which is being implemented in five districts through Mozambique's decentralized planning mechanisms. The area has low literacy rates (13%) and high poverty rates (45-65%).

142. The project includes participatory agricultural and land-use planning processes, and support to climate resilient sustainable land management intervention measures such as agro-forestry, soil conservation, wetland protection and fireless honey collection methods, small scale irrigation and improved grazing management, and access infrastructure. It builds on the NAPA and supports (i) improved collection of meteorological data and weather forecasting, (ii) enhanced capacity of farmers to collect and store water to mitigate droughts and develop drought and flood management plans; (iii) mapping of land cover dynamics and erosion vulnerability in coastal regions; (iv) improved characteristics and use of hydrological resources; and (v) training and capacity building. It specifically supports development of a dynamic landscape/water resource analysis framework for the Zambezi Basin, including predictions of the consequences of climate variability and land use/land cover change; and geospatial hydrological models. Impact monitoring programs have also been developed.

143. The proposed PPCR program in the Zambezi Basin would build on and scale up these interventions, "learning by doing" and with additional focus on monitoring and integrating natural resource and agriculture interventions with interventions to address climate risks in roads and buildings. The objective would be to support integrated climate resilience at a scale

sufficient to have substantial impact and provide lessons for sectoral and spatially based interventions elsewhere in the country.

Annex 12: Summary of Consultative Meetings with Private Sector, NGOs, Government, development partners

MINUTES GOVERNMENT STAKEHOLDERS CONSULTATION

01-12-09

(Dtor Wamusse shares some background about previous prep mission of PPCR and about the consultations to be undertaken during the current formulation mission).

Pwp presentation

- ACC agenda in Moz: CC impacts and ensuing adaptation needs.
- Impacts by sector: agri, coast,
- CIF structure
- PPCR generic objectives and objectives in Moz

DISCUSSION

JC:

Priorities identified by INGC studies are: coastal protection (Maputo and Beira) and agriculture and natural resources man. The second study (cost of adap) include two other sectors: transport (roads network maintenance and climate resilient dev), and energy investments (hydro).

Atanasio Manhique (INAM)

Priority areas for investment already identified has left out investment in meteo network, a key piece to understand CC impacts and produce the info needed to forecast future impacts.

Meteo should be a specific area of investment, not just being mainstreamed at other sectors level.

Rui Brito (UEM and INGC)

Other areas identified by INGC study is the specific investments needed to respond to intensified extreme events (DRR, coastal protection, communities' resilience, sensibilization on CC issues, water management, agric and FS, urban env). To be considered also fisheries/marine ecosystems, health sector, these were not researched d by INGC but are key to the country's dev.

MINAG

Needs clarification about the implementation phase of PPCR. Despite Moz being ahead of other countries for phase I, in the next months, investments are still necessary bcs extreme events will continue happening in the near future.

How are institutions going to access PPCR funds in the near future?

RW (MICOA)

Information from existing studies will help determine priorities in the next 3 months aprox. After this , it is expected to eneter implementation in the first semester of 2010.

JC (WB)

By the end of this mission, the info available at the country level is probably sufficient to draft an investment plan for MOz rather quickly (3 months). Once this ready and presented to PPCR investment committee, then the project itself can trigger off and access the funds.

The challenge will be prioritizing at sector and regional level to guarantee the impact of the funds available. Focusing rather than spreading the funds.

Agric and nat res includes forestry and fisheries, and water management.

IK (UNDP)

Might be worth it to consider water man and irrigation as a specific sector?

Olagoke Oladapo (AFDB)

Irrigation as part of nat res.

Existing programme on irrigation could be scaled up with PPCR funds (Frauke has the details).

JC (WB)

Using opport to upgrade/climate proof already existing programmes under preparation or implementation could be a wise move to accelerate and make the best use of PPCR funds.

INGC consultant

Stresses the need for supporting the upgrade of DRR related responses. Sismic risks (??) and meteo network extension.

Funds should be spent in issues that are funds orphan (coastal protection for instance). Be strategic in terms of what is included in the PPCR proposal and favor areas that are difficult to fund with other sources.

Institutional arrangements are still unclear: is it MICOA and/or INGC? ↗ need for institutional framework and capacities

IK (UNDP)

AAP and INGC II do take into account the need to strengthen and clarify the institutional setting.

RZ (DFID)

The issue of coordination and info management is key to ensure no duplication is made. Eg: UNHAB is prioritizing coastal protection and urban areas (Municipality of Maputo) in their CC strategy.

Coordination is key to make sure we know who is doing what and maximize the impact of funds.

M (WB)

GoM is best placed to ensure this coord, but you also need to take into account the scale of interventions. Un Hab working in Mpauto does not ensure urban areas are covered.

JC (WB)

Is it better to select activities where to climate proof interventions or pick up sectors that have not been covered yet ↗ a strategic decision to be made by GoM

MM (UNDP)

The need for coord with dev partners has already been acknowledged and the EDWG will meet with the PPCR mission

Frauke (WB)

More funds coming to the country for CC related issues, is a given. Institutional arrangements need to be there before hand, for the PPCR and for other upcoming funds.

RB (INGC)

The issue goes beyond coordination, it's a question of leadership, of where the decision making lies, of who will eventually lead to decision making.

AM (INAM)

The issue of leadership is not a new one. During the formulation of the AAP, it was suggested to create an overarching institution with capacity to decide at both the political and technical level.

Maybe part of the PPCR funds could support this coordination role.

INGC consultant.

First let's reach consensus about what is to be done, and then decide what projects' respond to this and how to manage them.

The merit of the INGC study is the alarm to the institutions. The priority remains to respond to institutional arrangement needs. Not in favor to create yet another new CC institution.

Either MPD, or MICOA can do this. At this stage it is rather about creating the capacities at the institutional level.

AM (INAM)

The idea is not so much a new institution, it is an internal issue to to be tackled by the GoM. Decide who has the mandate to coord, this needs to be made clear to all relevant stakeholders.

And if the selected institution doesn't not have the potential, then there is where the capacity development needs to happen.

When it comes to implementation, the mechanisms are probably already in place, the budget allocation and the coordination of Gov at MPD level.

MM (UNDP)

Clarifies AAP is not UNDP, it is UNDP assisting financially the GoM to strengthen its institutional framework.

RW (MICOA)

Leadership belongs to the Gov, the focus of the debate should be what to invest the funds into.

AM (INAM)

The idea transmitted by MICOA remains unclear: maybe some guidance is required in terms of what is eligible to funds allocation.

Sectors already identified:

1. Early warning, institutional strengthening to respond to CC, including meteo information systems
2. Coastal protection in cities, a Strategic investment plan for cities in the light of impacts of CC (Vilankulo, Beira and Maputo identified as the most vulnerable urban areas) . Pemba and Nacala tbc. Pemba, Beira identified as vulnerable spots in phase I and in phase II the specific risks affecting them were id as well as the options for response.

OO (AfDB)

Need to establish criteria for selection of activities into sectors, and be guided by science and existing studies and not just by intuition.

INGC study has already set the priorities, why not using it as a guide for decision making?

3. Agric and nat res management

((MPD: the needs by sectors should be id, and then compare with the Gov plans and the results from consultations with other stakeholders.))

AM (INAM)

Agric and nat res should not be put together...

MINAG

- Drought resistant crops, irrigation systems (micro damns)
- Livestock management due to new pests outbreak

The issue of increasing agric yields is not covered by only drought tolerant crops, this would only cover semi-arid areas. The issue of crop productivity goes beyond subsistence agric in semiarid areas.

Rui and Isabel: In agric, there are 2 issues to be covered: food security and the upscale of agric production (beyond food security needs).

RZ (DFID)

Cyclones impact in rural areas could be considered.

RW (MICOA)

Let's remember it's a PILOT programme. Need to concentrate funds into max 3 specific topics

JC (WB)

Good to have all the options listed and described, and then in a second mission do the prioritizing exercise. The selection doesn't need to be made now.

How transformational an investment is should be one of the criteria guiding selection.

RZ (DFID)

Water supply an issue to be addressed to avoid water shortages in the future, as well as River basin Management. Both will require international negotiations.

Watershed and river basin management: erosion control, re-vegetation, bush fire control, river ecosystem restoration.

Fisheries: coastal ecosystem protection and restoration.

MINUTES PRIVATE SECTOR CONSULTATION

2. December, 2009

The following brief summarizes the outcomes from the discussion with the private sector stakeholders to seek their feedback and input in light of the objectives outlined in PPCR documents related to the private sector.

The workshop, chaired by MICOA and facilitated by INGC and a Joint Mission representative, was attended by participants representing the views of a variety of sectors, including energy infrastructure, transport, agriculture and forestry, mining, oil and gas, and banking, as well as SMEs, represented by Mozambique Private Sector Confederation.

The workshop's presentation informed the participants about the implications of possible climate impacts on the private sector and on their sustainability, including increased operational, financial, and credit risks, and principal climate related threats in Mozambique.

The discussion was initiated with questions to the participants about their perception on the availability of relevant information and capacity to evaluate direct and indirect climate risks and impacts to their businesses and/or sectors, and the ability to choose and implement appropriate adaptation measures. Similarly, participants were asked for feedback about what they perceive as major barriers and needs that need to be fulfilled to enable successful increase of their climate resilience. Finally, feedback was sought on which initiatives and investments for climate resilience should be prioritized.

The main points and conclusions from the discussion were:

- Currently there is very little knowledge or awareness on the climate risks and how will these affect the private sector,
- The subject of climate risks and relevant economic impacts is new for most of the participants, and it is not possible to make decisions about specific adaptation priorities or activities without the necessary information,
- There is a need for analyses on direct and indirect climate impacts addressing specific sectors and from the private sector point of view,

- In addition to the information about the impacts, there is a need for specific adaptation options and solutions,
- The available and future information, as well as best practice examples, need to be appropriately disseminated. A few participants expressed the need for capacity building.
- There is a need to understand impacts on key infrastructure sectors
- There is an evident need for a sectorally oriented approach,
- There is a need for appropriate policies and regulations (e.g. building codes, zoning) that address climate change and resilience,
- There is a need for appropriate incentives (e.g. tax incentives) that would spur implementing adaptation initiatives,
- There is a need to develop appropriate insurance products that would address climate change and incentivize appropriate adaptation changes.

MINUTES DONOR COMMUNITY CONSULTATION

02-12-09

(Dtor Wamusse shares some background about previous prep mission of PPCR and about the consultations to be undertaken during the current formulation mission).

Summary of discussion

AfDB

Missed energy efficiency and renewable energies in the list of priorities.

- Marjorie (WB) informs about the existence of a new fund for energy efficiency and renewable in LDCs (under development).

Activities within each prioritized sector will need to be identified.

JC (WB)

PPCR only looking at the first investment needs, won't be the last CC related investment in the country.

Marjorie: and one of the selection criteria will include the search for quick wins, i.e.: it could be considered to support with extra funds already ongoing initiatives in sectors, and use the PPCR investment to climate proof them.

VS (IFC)

Recalls the messages from the private sector, that there isn't enough info, that they need support in terms of how to address risks, that an incentives scheme and a crediting strategy would be very welcomed.

Mirjam Palm (Sweedish Embassy)

Points at the need to coord with the private sector component of INGC phase II

Sectoral interventions by sectors is not clear yet, as well as MICOA's leadership in this process...

Nadia Vaz (WFP)

The impact of CC on food security is still not sufficiently analysed and prioritized in policies.

The impacts at community level also need to be addressed.

RW (MICOA)

The GoM has worked in coordination on environmental issues through MICOA through its coordination bodies. Eg: in the run up to Copenhagen, all the public statements have involved all the different sectors in their consultations.

PPCR needs for sectoral coordination won't be new to the Moz Gov. Former experience and existing coord mechanisms at GoM will be used.

MICOA is the lead institution, doesn't mean will be the boss, but that they will coord to ensure all relevant stakeholders are sit on the table and guided through discussions.

Climate resilience: there are already strategies and plans, such as the NAPA. PPCR is an opportunity for the country to streamline and finance all of these plans that haven't reached implementation yet.

MM (UNDP)

Most of what is listed under PPCR Phase I corresponds to INGC Phase II

Some donors are financing INGC Phase II (UNDP, Denmark, France potentially)

INGC II includes donor coordination, the challenge now would be to ensure PPCR is in line with INGC II that is actually led by INGC and MICOA jointly.

JC (WB)

1,5 M of PPCR can go to preparatory activities, in case gaps remained in the country.

70 M of PPCR could go to sectors prioritized during PPCR phase II.

Hydro power, transport and ?? have been identified as potential investment priorities by the Study on the economics of adaptation to CC.

Nat res needs to be further researched before a decision about its investment needs is made.

RZ (DFID)

Beyond the NAPA , what implementation?

Ik (UNDP)

Clarifies sharing info about the request from MICOA to UNDP to provide technical support for the formulation of a proposal to access LDC-F funds.

Marjorie (WB)

Clarity is needs in terms of the role of MICOA as a coordinator of preps., not in leading implementation of activities under sectors (that will rely on the leadership of Gov institutions in each of those areas).

Tom Durang (MICOA/DANIDA)

Interesting moves in the elaboration of the Plano Quinquenal. MICOA included the sectors in the development of their proposals for the plan oquinquenal.

Need to focus on what comes out of the Plano Quinquenal, and how to support the official planning process.

AFDB

Introduces the idea of concentrating on a geographical scope of those sectoral priorities identified. Pilot areas?

Oystein (Norwegian Embassy)

Forestry is a strategic sector for the future of Moz, and is already in the making.

Beira: investment plans of the city.

Build on the constituency of INGC process, spot what has not found funds yet, and complement this.

Additional funding from Norway? Not now, but maybe in the future. Bilaterals are also getting funds for adaptation and it would make sense to supplement necessary funds in Moz and align them with PPCR.

JC (WB)

Interest from WB side to explore those potential opportunities to blend PPCR funds with other donor's funds and potentially turn this into a SAWP approach to CC.

Beira might be a good pilot to address the CC issue from a territorial planning perspective. (Beira corridor project).

An extra meeting has been organized for Friday 4th Dec at Avenida Hotel with all the stakeholders together (Gov, private sector, civil society, donor)

Marjorie (WB)

REDD and PPCR will work closer together. AfDB is leading on agriculture and nat res management.

RW (MICOA)

Annex 13: List of Persons Met

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