GLOBAL ENVIRONMENT FACILITY
INVESTING IN OUR PLANET

Naoko Ishii
CEO and Chairperson

May 19, 2016

Dear LDCF/SCCF Council Member:

UNDP as the Implementing Agency for the project entitled: ***Mali: Flood Hazard and Climate Risk Management to Secure Lives and Assets in Mali***, has submitted the attached proposed project document for CEO endorsement prior to final approval of the project document in accordance with UNDP procedures.

The Secretariat has reviewed the project document. It is consistent with the proposal approved by LDCF/SCCF Council in January 2015 and the proposed project remains consistent with the Instrument and LDCF/SCCF policies and procedures. The attached explanation prepared by UNDP satisfactorily details how Council's comments have been addressed. I am, therefore, endorsing the project document.

We have today posted the proposed project document on the GEF website at www.TheGEF.org. If you do not have access to the Web, you may request the local field office of UNDP or the World Bank to download the document for you. Alternatively, you may request a copy of the document from the Secretariat. If you make such a request, please confirm for us your current mailing address.

Sincerely,

Naoko Ishii
Chief Executive Officer and Chairperson

Attachment: GEFSEC Project Review Document
Copy to: Country Operational Focal Point, GEF Agencies, STAP, Trustee

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GEF-6 REQUEST FOR PROJECT ENDORSEMENT/APPROVAL

PROJECT TYPE: Full-sized Project
TYPE OF TRUST FUND: Least Developed Countries Fund

For more information about GEF, visit TheGEF.org

PART I: PROJECT INFORMATION

Project Title: Flood hazard and climate risk management to secure lives and assets in Mali			
Country(ies):	Republic of Mali	GEF Project ID:[1]	5855
GEF Agency(ies):	UNDP	GEF Agency Project ID:	5236
Other Executing Partner(s):	Agence pour l'Environnement et le Développement Durable (AEDD), Agence Nationale de la Météorologie (Mali-Meteo), Directorat of Hydraulic, Directorate General of Civil Protection (DGPC), local governments	Submission Date:	21 April 2016
GEF Focal Area (s):	Climate Change Adaptation	Project Duration (Months)	60
Integrated Approach Pilot	IAP-Cities ☐ IAP-Commodities ☐ IAP-Food Security ☐	Corporate Program: SGP ☐	
Name of Parent Program	n/a	Agency Fee ($)	847,875

A. FOCAL AREA STRATEGY FRAMEWORK AND OTHER PROGRAM STRATEGIES[2]

Focal Area Objectives/Programs	Focal Area Outcomes	Trust Fund	(in $)	
			GEF Project Financing	Co-financing
CCA-1	Outcome 1	LDCF	3,135,000	20,178,763
CCA-2	Outcome 2	LDCF	1,939,000	13,911,727
CCA-3	Outcome 3	LDCF	3,851,000	17,656,417
	Total project costs		8,925,000	51,746,907

B. PROJECT DESCRIPTION SUMMARY

Project Objective: Preparing municipalities and local governments to manage flood hazards and climate risks and secure lives and assets in Mali

Project Components/ Programs	Financing Type[3]	Project Outcomes	Project Outputs	Trust Fund	(in $)	
					GEF Project Financing	Confirmed Co-financing
1. Strengthened technical capacity of municipal and village authorities to improve flood early warning systems and dissemination of climate-related risk information.	INV	Strengthened technical capacity of municipal and village authorities to improve flood early warning systems and dissemination of climate-related risk information.	1.1: A sound climate information system comprising devices operating 24 hours a day to monitor and forecast flood risks and hazards is established. 1.2: Early warning and quick-response systems are developed to increase the resilience of vulnerable local communities in the	LDCF	3,135,000	20,178,763

[1] Project ID number remains the same as the assigned PIF number.
[2] When completing Table A, refer to the excerpts on *GEF 6 Results Frameworks for GETF, LDCF and SCCF*.
[3] Financing type can be either investment or technical assistance.

			intervention sites. 1.3: Risk mapping combining flood risks with socio-economic indicators – including inter alia population-related indices, land value, land uses, assets – is undertaken. 1.4: An education programme and awareness-raising campaign is undertaken within schools and local communities to build a culture of safety and resilience to floods.			
2. Addressing flood risk management into medium and long term planning process at the local level	INV	Effective flood risk management mainstreamed into the relevant development planning policies and budgetary processes to increase the resilience of local communities.	2.1: Commune-specific Flood Risk Reduction Plans (FRRPs) with locally-appropriate strategies and interventions to decrease the vulnerability of local communities to floods are developed. 2.2: Design, harmonise and enhance existing building and settlement codes to decrease vulnerability of local communities to floods. 2.3: Financial strategies are developed and implemented to improve the financial capacity of local authorities to respond timely to climate-related hazards, in particular floods. 2.4: The technical capacity of the relevant national and local authorities on climate risk management planning as well as flood prevention and reduction measures is enhanced.	LDCF	1,514,000	12,611,727
3. Climate-resilient investment to reduce risks of highly exposed communities.	INV	Climate-resilient flood risk management and reduction techniques transferred to local communities	3.1: Flood risk reduction interventions are implemented to increase water infiltration and reduce soil erosion. 3.2: Flood risk reduction	LDCF	3,851,000	17,656,417

		within the targeted communes to decrease their vulnerability.	interventions are implemented to reduce the vulnerability of human lives and infrastructure.			
				Subtotal	8,500,000	50,446,907
				Project Management Cost (PMC)[4]	425,000	1,300,000
				Total project costs	8,925,000	51,746,907

C. CONFIRMED SOURCES OF CO-FINANCING FOR THE PROJECT BY NAME AND BY TYPE

Please include evidence for co-financing for the project with this form.

Sources of Co-financing	Name of Co-financier	Type of Cofinancing	Amount ($)
National Government	Mali-Météo	Cash	24,690,000
National Government	Government of Mali/Federal Government of Germany	Cash	12,327,411
National Government	Government of Mali	Cash	4,929,496
Local government	UNDP	Cash	6,000,000
National Government	AEDD	Cash	2,500,000
GEF Agency	UNDP	In-kind	800,000
National Government	AEDD	In-kind	500,000
Total Co-financing			51,746,907

D. TRUST FUND RESOURCES REQUESTED BY AGENCY(IES), COUNTRY(IES) AND THE PROGRAMMING OF FUNDS

GEF Agency	Trust Fund	Country Name/Global	Focal Area	Programming of Funds	(in $)		
					GEF Project Financing (a)	Agency Fee a) (b)[2]	Total (c)=a+b
UNDP	LDCF	Mali	CC-A	(select as applicable)	8,925,000	847,875	9,772,875
Total Grant Resources					8,925,000	847,875	9,772,875

a) Refer to the Fee Policy for GEF Partner Agencies

E. PROJECT'S TARGET CONTRIBUTIONS TO GLOBAL ENVIRONMENTAL BENEFITS[5]

Provide the expected project targets as appropriate.

Corporate Results	Replenishment Targets	Project Targets
1. Maintain globally significant biodiversity and the ecosystem goods and services that it provides to society	Improved management of landscapes and seascapes covering 300 million hectares	*0 hectares*
2. Sustainable land management in production systems (agriculture, rangelands, and forest landscapes)	120 million hectares under sustainable land management	*0 hectares*
3. Promotion of collective management of transboundary water systems and implementation of the full range of	Water-food-ecosystems security and conjunctive management of surface and groundwater in at least 10 freshwater basins;	*0 Number of freshwater basins*

[4] For GEF Project Financing up to $2 million, PMC could be up to10% of the subtotal; above $2 million, PMC could be up to 5% of the subtotal. PMC should be charged proportionately to focal areas based on focal area project financing amount in Table D below.

[5] Update the applicable indicators provided at PIF stage. Progress in programming against these targets for the projects per the *Corporate Results Framework* in the *GEF-6 Programming Directions*, will be aggregated and reported during mid-term and at the conclusion of the replenishment period.

policy, legal, and institutional reforms and investments contributing to sustainable use and maintenance of ecosystem services	20% of globally over-exploited fisheries (by volume) moved to more sustainable levels	*0 Percent of fisheries, by volume*
4. Support to transformational shifts towards a low-emission and resilient development path	750 million tons of CO_{2e} mitigated (include both direct and indirect)	*0* metric tons
5. Increase in phase-out, disposal and reduction of releases of POPs, ODS, mercury and other chemicals of global concern	Disposal of 80,000 tons of POPs (PCB, obsolete pesticides)	*0 metric tons*
	Reduction of 1000 tons of Mercury	*0 metric tons*
	Phase-out of 303.44 tons of ODP (HCFC)	*0 ODP tons*
6. Enhance capacity of countries to implement MEAs (multilateral environmental agreements) and mainstream into national and sub-national policy, planning financial and legal frameworks	Development and sectoral planning frameworks integrate measurable targets drawn from the MEAs in at least 10 countries	*Number of Countries: 0*
	Functional environmental information systems are established to support decision-making in at least 10 countries	*Number of Countries: 0*

F. DOES THE PROJECT INCLUDE A "NON-GRANT" INSTRUMENT? No

(If non-grant instruments are used, provide an indicative calendar of expected reflows to your Agency and to the GEF/LDCF/SCCF Trust Fund) in Annex D.

PART II: PROJECT JUSTIFICATION

A. DESCRIBE ANY CHANGES IN ALIGNMENT WITH THE PROJECT DESIGN WITH THE ORIGINAL PIF[6]

1. No changes in alignment with the project design of the original PIF have been made at PPG stage. While the wording of the project outcomes an outputs have been altered to make them more flood-specific, they remain based on the same underlying principles. In addition, the revisions to the outputs makes the project more relevant to the Malian context thereby addressing the priorities expressed by the Government of Mali, local communities and other relevant stakeholders. These consultations were used to refine the outputs in order to achieve the desired developmental outcomes in accordance with the original PIF. These revisions are presented in the table below.

Output as written in PIF	Output revised during the PPG
1.1. Establish sound climate information systems and devices operating 24 hours a day for monitoring and forecasting flood hazards and providing reliable warnings using mobile phone platforms;	1.1. A sound climate information system comprising devices operating 24 hours a day to monitor and forecast flood risks and hazards is established.
1.2. Develop early warning and quick-response systems including distributing early warning information	1.2. Early warning and quick-response systems are developed to increase the resilience of vulnerable local communities in the intervention sites.
1.3. Undertake climate hazard analysis combining flood hazard mapping with socio-economic indicators (e.g. population maps, land value, assets and land use information) to derive associated risks;	1.3. Risk mapping combining flood risks with socio-economic indicators – including inter alia population-related indices, land value, land uses, assets – is undertaken.

[6] For questions A.1 –A.7 in Part II, if there are no changes since PIF , no need to respond, please enter "NA" after the respective question.

1.4. Develop and role out education programme among school children to build a culture of safety and resilience from floods and other climate change related hazards.	1.4. An education programme and awareness-raising campaign is undertaken within schools and local communities to build a culture of safety and resilience to floods.
2.1. Develop Flood Risk Reduction plans for Municipalities and villages (FRRP) that include local strategies, ,and concrete steps on how to reduce the risks from floods;	2.1. Commune-specific Flood Risk Reduction Plans (FRRPs) with locally-appropriate strategies and interventions to decrease the vulnerability of local communities to floods are developed..
2.2. Design, harmonize and enhance existing building & settlement codes to address resilience to climate change induced flooding;	2.2. Design, harmonise and enhance existing building and settlement codes to decrease vulnerability of local communities to floods.
2.3. Develop financial strategies to ensure adequate financial capacity and rapid release of funds, thus enabling emergency response, reconstruction of public assets and infrastructure and targeted financial assistance.	2.3. Financial strategies are developed and implemented to improve the financial capacity of local authorities to respond timely to climate-related hazards, in particular floods.
2.4. Targeted training of national and local authorities responsible for climate risk management in advanced methods of forward looking climate risk management planning and flood prevention measures;	2.4. The technical capacity of the relevant national and local authorities on climate risk management planning as well as flood prevention and reduction measures is enhanced.
3.1. Climate risk reduction measures implemented such as bank terracing, vegetative buffers, etc. implemented to increase the infiltration and reduce erosion	3.1. Flood risk reduction interventions are implemented to increase water infiltration and reduce soil erosion.
3.2. Structural measures, such as embankments, dykes, levees and floodwalls, etc., financed to protect human health and safety, and valuable goods and property.	3.2. Flood risk reduction interventions are implemented to reduce the vulnerability of human lives and infrastructure.

No outputs, originally written into the PIF, were removed during the PPG phase.

A.1. *Project Description*.

1) The global environmental and/or adaptation problems, root causes and barriers that need to be addressed.

1. The Republic of Mali (hereafter Mali) is a landlocked Least Developed Country (LDC) in West Africa that extends across 1,241,238 km^2 of the Sahel-Saharan region. Mali is characterised by a relatively uniform and flat topography with an average altitude of ~500 metres above sea level. Currently, the population of Mali is estimated to be 16,955,536 people[7], of which ~75% live in rural areas. Poverty is widespread, with approximately half of the population living below the international poverty line of US$ 1.25 per day[8]. In 2012, poverty was further exacerbated by political instability in the country whereby the growth of the economy declined from 6% to -1.2%. These socio-economic and political conditions have undermined the ability of the Government of Mali (GoM) to achieve national development objectives such as those defined by the National Poverty Reduction and Growth Strategy Paper (CSCRP). This strategy promotes the sustainable development of the agricultural, fisheries, mining and energy sectors. However, several underlying barriers are likely to hinder Mali's socio-economic development. These barriers include *inter alia* the current degradation of the environment and natural resources, as described below.

2. The growth of the agricultural sector over the past decade has been underpinned by the expansion of cultivated land. This expansion of cultivated land, coupled with the widespread practice of slash and burn

[7] CIA World Factbook. Available at https://www.cia.gov/library/publications/the-world-factbook/geos/ml.html. [Accessed on: 04 October 2015].
[8] UNICEF. 2013. Mali Statistics. Available at http://www.unicef.org/infobycountry/mali_statistics.html. Accessed on 15 October 2015.

agriculture, has led to the large-scale removal of natural vegetation[9]. In addition to this degradation, the unsustainable harvesting of woodfuel – which accounted for ~90% of household energy use in 2005 – is causing extensive deforestation. Overall, the expansion of unsustainable agricultural practices combined with the increased demand for woodfuel has led to widespread ecosystem degradation in Mali. Decreased soil fertility and increased erosion resulting from widespread ecosystem degradation mentioned above have led to a decrease in agricultural productivity and the abandonment of cultivated lands[10].

3. Since the 1970's, an increase in average temperature has been observed across Mali. This trend is expected to continue, and climate models predict that by 2080 Mali's mean annual temperature will increase by 3-4°C relative to the annual temperature in 1980[11]. This represents a predicted temperature increase that is 1.5 times the global average, which will occur throughout all seasons but will be more pronounced in the rainy season[12]. In addition to increased temperatures, an observed change in climate in Mali is a decrease in average annual rainfall. For example, during the period 1971-2000, an average 20% decrease in rainfall was observed across the country relative to 1951-1970[13]. According to future climate scenarios, Mali will experience a decrease in average rainfall ranging from 5-10% from 2050 onwards relative to the period 1960-1990[14]. An increase in the spatial and temporal variability of rainfall is also likely to be observed. The variations in temperature and rainfall over the last few decades have been further compounded by climate-related hazards such as droughts, floods, strong winds, sand storms and heat waves[15]. It is predicted that the intensity and frequency of these climate-related hazards will increase under future conditions of climate change[16]. This will include an increase in intense rainfall events, which will in turn increase the occurrence of floods. The resulting effect is an increasing threat to lives and the built infrastructure in the country[17].

4. As a result of climate change, Mali is increasingly experiencing floods. From 1980-2007, two significant floods were recorded that collectively impacted over 3,000,000 people[18]. In addition, the floods experienced in Bamako in August 2013, affected over 34,000 people out of which ~20,000 were displaced[19]. These floods resulted in the death of 37 people and the loss of 280 homes in the capital city of Bamako[20]. In 2014, 98.5% of economic losses as a result of disasters are attributed to floods amounting to US$ 45,000,000 per year[21]. The areas most affected by floods over the last 30 years are located within the Niger delta[22] and include *inter alia* Bamako, Timbuktu, Gao, Mopti, Ségou, Kayes, Koulikoro and Sikasso[23]. Some of the floods experienced in Mali have reported to damage over 12,000 hectares of crops thereby negatively affecting the livelihoods.

[9] It is estimated that natural vegetation is removed from ~400,000 hectares of land annually. Source: UNEP. 2005. Connecting ecosystems and poverty in Mali.
[10] Climate change and poor management of natural resources. 2008.
[11] Since the 1970's, temperatures in the Sahel region11 have increased by 0.2-0.8°C relative to the average and the rate of increase has been more rapid than the global trend Source: Ministry of Environment and Sanitation: Environment and Sustainable Development Agency. 2011. Mali climate audit.
[12] The rainy season extends over 3 to 6 months and occurs from May to October in the south and from July to September in the north. Source: Ministry of Environment and Sanitation: Environment and Sustainable Development Agency. 2011. Mali climate audit.
[13] Since the 1970's, a greater temperature variation has been experienced in the areas characterised by a Sahelian climate as compared to other parts of Mali. Source: Ministry of Environment and Sanitation: Environment and Sustainable Development Agency. 2011. Mali climate audit.
[14] Ministry of Environment and Sanitation: Environment and Sustainable Development Agency. 2011. Mali climate audit.
[15] Ibid.
[16] Ministry of Environment and Sanitation: Environment and Sustainable Development Agency. 2011. Mali climate audit.
[17] Ibid.
[18] During the same period, five major droughts were experienced. Of these, the most severe droughts occurred in 1980 and 2005 impacting ~1,500,000 and 1,000,000 inhabitants respectively and leading to the loss of lives, plantations and livestock. Source: EU. 2014. Update of Mali's environmental profile.
[19] OCHA. 2013. Rainy season overview: West and Central Africa.
[20] Ibid.
[21] Prevention web. Mali: Disaster and risk profile. 2014. Source: http://www.preventionweb.net/countries/mli/data/.
[22] The delta is inhabited by ~1 million people with the main town being Mopti with ~75,000 people. It is one of Mali's most significant producing areas with the three main production systems being livestock, agriculture and fisheries. Source: World Meteorological Organisation. 2004. The associated programme on flood management: Mali flood management-Niger River Inland Delta.
[23] Ministry of Environment and Sanitation: Environment and Sustainable Development Agency. 2011. Mali climate audit.

5. Under the predicted conditions of climate change, an increasing number of climate-related hazards such as floods and heat waves is likely to occur. These hazards are predicted to increase in severity and frequency under future climatic conditions[24]. An increase in the severity and frequency of this hazard is likely to result in a larger number of flood-induced human deaths, people displaced, damages to houses and public infrastructure, and loss of crops. The above consequences of floods will have significant socio-economic impact in the country. Economic losses exceeding US$ 45,000,000 are likely to occur thereby undermining the GoM's efforts to address poverty and socio-economic development in the country.

6. The underlying causes of vulnerability of the Malian population to floods are:

- *Poverty*. Impoverished households are vulnerable to floods because of: i) widespread reliance on natural resource-based livelihoods, which are threatened by floods[25]; ii) limited availability of alternative livelihood options; and iii) limited technical and financial capacity to develop and implement adaptation interventions.
- *Land degradation*. There is widespread degradation of natural ecosystems because of inappropriate environmental management, overgrazing by livestock, unsustainable harvesting of woody vegetation for woodfuel, and the removal of natural vegetation to support agricultural expansion. Land degradation increases the severity of the effects of floods through the reduced infiltration of rainwater by degraded soils. In addition, land degradation results in increased soil erosion.
- *Limited financial resources***.** The GoM is limited in its capacity to finance a national response to climate change, including funding of investments in adaptation measures such as prediction, protection and management of floods.
- *Settlement pattern within the delta***.** Prolonged droughts since the 1970s have been experienced in the northern parts of Mali which have increased internal migration from the north to water resources in the south[26]. The resulting effect of the rapid influx of people to the densely populated south of Mali is that many houses and infrastructure have been established on floodplains, river beds and basins. People living in these flood-prone areas are highly exposed to floods and are therefore vulnerable. In Mali, floods have resulted in the loss of many lives, livelihoods and houses as well as severe damage to structures.

7. To improve the economy in the face of ongoing socio-political challenges, ecosystem degradation and climate change, the GoM developed several sectoral and cross-sectoral policies, plans and strategies. These include *inter alia* the CSCRP, the National Policy on the Protection of the Environment (PNPE), the National Strategy on Sustainable Development (SNDD), the National Adaptation Programme of Action (NAPA), and the National Plan for Multi Risk Preparation and Emergency Disaster Response (PNMRRC).
However, the implementation of these policies and strategies has been limited. Contributory factors include weak institutional capacity and incoherence between existing policies and strategies. The barriers hindering the GoM's capacity to address floods in the country are discussed in the next section.

Barriers to increasing Mali's capacity to reduce and manage floods

8. There are several institutional, technical and financial barriers to effectively reduce and manage the effects of floods in Mali. The Least Developed Countries Fund (LDCF)-financed project will contribute towards overcoming the barriers limiting the implementation of effective flood reduction and management interventions by local government authorities in Mali, as listed below.

- *Limited capacity of national institutions to effectively predict floods and other climate-related risks*. At present, the availability and accessibility of reliable weather data is not sufficient to enable accurate

[24] Ministry of Environment and Sanitation: Environment and Sustainable Development Agency. 2011. Mali climate audit.
[25] IFAD. 2012. Evaluation of the environment and climate change in Mali.
[26] This migration pattern has furthered urbanisation in Mali. It is predicted that urbanisation will increase from 36% in 2010 to 60% by 2024, largely as a result of the predicted increase in frequency and severity of droughts in the north under the conditions of climate change and political instability. Source: International Organisation for Migration. 2013. The Mali migration at a glance.

prediction of rainfall and resultant flood risks by Mali-Météo and the DNH[27]. These institutions therefore have limited capacity to generate weather-related information to disseminate timely early warnings in the event that a flood is predicted. In addition, the national system for issuing flood warnings to the public is currently ineffective, particularly in rural areas. Flood warnings are broadcasted via means and languages that are not accessible to all local communities.

- *Limited knowledge and application of adaptation measures related to flood management*. In Mali, the authorities responsible for the design and application of flood protection measures – including *inter alia* Mali-Météo, the DNH and the DGPC – do not have sufficient experience developing or implementing effective flood protection measures. This is because over the past 30 years, measures to manage the effects of droughts have been prioritised in the country over flood disaster risk preparedness and recovery.

- *Limited skills and resources of planning authorities at local level* (municipalities and villages) to efficiently carry out responsibilities pertaining to flood risk management. An integrated approach to climate change adaptation is dependent on: i) the availability of data; ii) locally-appropriate methodologies; and iii) technical expertise to assess the potential physical and economic impacts of climate change and associated flooding in the country. The quality and availability of such data and expertise within Mali's local authorities is insufficient to develop detailed and locally-appropriate climate change adaptation strategies. Furthermore, there is minimal technical and financial support to local authorities to develop and implement flood adaptation interventions. In Mali, the ongoing processes of land use planning and urban planning are generally undertaken with limited consideration of factors related to climate change, including predictions of future vulnerability to climate-related hazards such as floods[28]. For example, the design of Bamako's urban drainage systems did not include adequate consideration of the likely volume of annual floodwaters. Consequently, past flood events have been characterised by widespread sanitation problems and damage resulting from floodwaters of up to four metres[29].

- *Limited transmission of information and warning to the relevant local communities*. The existing EWS was developed to cater for the Niger delta in Mali[30] and warns communities by means of: i) radio; ii) internet[31]; iii) phone calls to local key stakeholderss to reach villages; and iv) weekly news bulletins. However, such warnings are provided for large seasonal flooding events but exclude flash floods[32]. Moreover, the majority of the population – particularly the rural population of Mali – are unable to access these warnings.

9. Although no single initiative can address all of the barriers mentioned above, the LDCF-financed project will deliver complementary outcomes to contribute towards overcoming these barriers. The LDCF-financed project will also support furthering the CSCRP, the National Plan for Multi Risk Preparation and Emergency Disaster Response (PNMRRC), the NAPA, and Sustainable Development Goals (SDGs) 3, 5, 6, 9, 11 and 13. Please see Appendix 1 for the alignment of the LDCF-financed project with the national and international priorities contained in these documents.

10. An increasing number of floods has been experienced in the last 30 years in Mali, which have resulted in human deaths and loss of livelihoods. As previously stated in Section I, floods experienced from 1980-

[27] McSweeny, C., New, M. & Lizcano, G. 2010. UNDP Climate Change Country Profiles: Mali. http://country-profiles.geog.ox.ac.uk.
[28] Green Climate Fund Project/Programme Concept Note. 2015.
[29] Ibid.
[30] Cools, J. & Innocenti, D. 2014. Input paper prepared for the 2015 global assessment report on disaster risk reduction. The United Nations Office for Disaster Risk Reduction, Geneva.
[31] http://www.opidin.org/en is an early warning system tool designed for the Inner Niger Delta to predict the level and the timing of the flood peak as well as the maximal flood extent.
[32] Cools, J. & Innocenti, D. 2014. Input paper prepared for the 2015 global assessment report on disaster risk reduction. The United Nations Office for Disaster Risk Reduction, Geneva.

2007 have adversely affected over 3,000,000 Malians[33] and are predicted to increase in frequency and severity under conditions of climate change. The LDCF-financed project will contribute towards achieving the long-term solution which is to manage and reduce the negative impacts of floods on communities and infrastructure in Mali. The theory of change adopted for this LDCF-financed project comprises addressing the barriers discussed in Section I while contributing to the preferred solution discussed below through the delivery of Outcomes 1, 2 and 3. The theory of change diagram is at the end of this section. The Problem Tree leading to the development of the theory of change is attached as Appendix 2. The preferred solution pertains to increasing the resilience of local communities to floods in Mali and comprises the following:

- *Increased knowledge of risks associated with flooding to support the development of locally-appropriate plans and approaches*. The preferred solution would include strengthening the capacity of the relevant authorities in Mali – such as Mali-Météo, the DNH and the General Directorate for Civil Protection (DGPC) – to identify which regions are the most vulnerable to flooding under the predicted conditions of climate change. Through strengthening government capacity, the capability for using Geographic Information System (GIS) to map flood risks would be enhanced. In so doing, variables such as population density, land value, asset types and land use would be taken into account. Based on the mapping, locally-appropriate plans would be developed by municipal- and village-level authorities to reduce the risks related to floods. These plans would consider and include: i) modern techniques for flood risk reduction including *inter alia* the use of geospatial analyses and modelled climate change predictions to identify flood-vulnerable sites; and ii) traditional flood management measures used by communities, such as the construction of levees. In addition, technical staff from national and local government authorities, including *inter alia* Mali-Météo, DNH, DGPC and municipalities, will receive training on a wide range of approaches to flood protection such as the establishment of dykes and vegetative buffers thereby increasing their technical capacity to use these approaches. Furthermore, the above-mentioned increased availability of information and technical capacity of the government authorities to respond to flood risks would support the adoption of a flexible approach to the management of floods according to the best available evidence at a particular point in time. This approach would be regularly updated in accordance with emerging information.

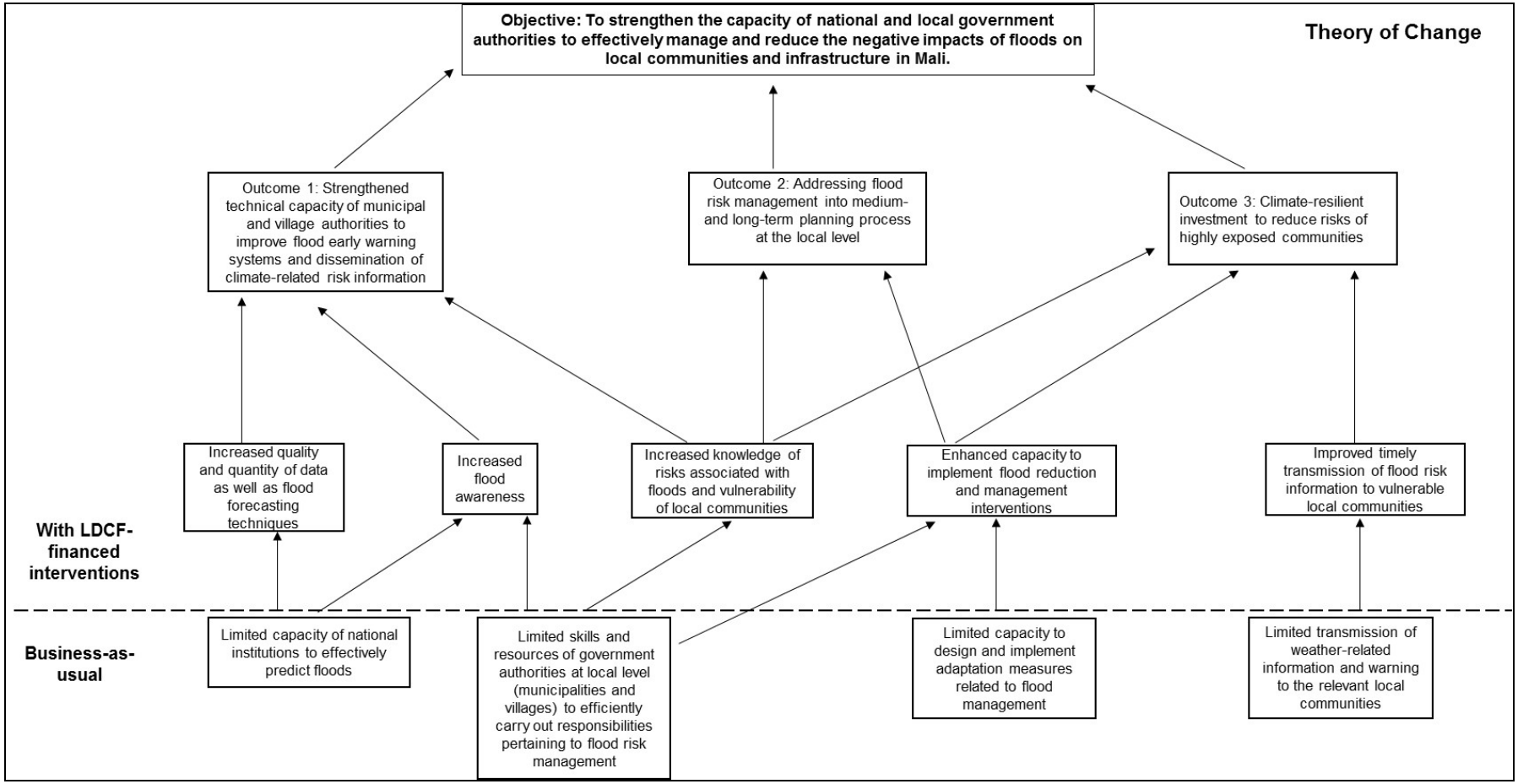
- *Implementation of flood management measures.* The preferred solution would include the identification and establishment of locally-appropriate flood management measures at sites that are identified as being at risk of flooding, both in the short- and the long-term as a result of predicted climate change impacts. Flood management measures would be complemented by the enhanced capacity of authorities – such as the DGPC, MEADD and Environment and Sustainable Development Agency (AEDD) – to integrate considerations related to flood risks into urban planning and infrastructural development. For example, existing building and settlement codes would be updated and revised to ensure that future infrastructural development includes consideration of flood risks in a meaningful manner. The revision of building codes would also incorporate measures to ensure that future drainage systems are designed to take the predicted frequency and severity of future flood risks into account. Such designs would be based on measured historical extremes of flood water levels and projected climate-related flood risks. Furthermore, the revision of building and settlement codes would include measures to ensure that infrastructural development incorporates adequate consideration of future needs and risks related to public sanitation. In so doing, the risks of outbreak of water-borne diseases associated with flooding – in both urban and rural areas – would be reduced. The implementation of these improved codes to include flood risks in infrastructural development would enhance the effectiveness of the physical flood management measures applied.

- *Increased flood preparedness*. The preferred solution would increase capacity at both the national – DGPC, MEADD, AEDD – and municipal level to respond timely to climate-related hazards, particularly floods. National disaster preparedness would be enhanced by establishing reliable early warning and monitoring systems. For hazards such as floods, Early Warning Systems (EWSs) based on modern

[33] EU. 2014. Update of Mali's environmental profile.

technologies that are cost effective to maintain would be continuously operational – staffed 24 hours a day – and would allow for the timely and reliable dissemination of warnings to both urban and rural communities using media such as mobile phone platforms. To ensure the availability of sufficient public funds for disaster response measures, actions to increase the national preparedness for climate-related hazards would include the development of financial strategies to increase the allocation of funds to local government authorities within communes and villages to develop locally-appropriate strategies to decrease their vulnerability to floods. These financial strategies will cover: i) an emergency response; ii) the reconstruction of public assets and infrastructure; and iii) targeted financial assistance to those adversely affected by floods.

- *Increased awareness of floods and associated risks*. The preferred solution would incorporate an increased level of awareness of the risks of floods within both urban and rural communities. Capacity-building activities would include the provision of training to both national and local authorities on flood risks and management, as well as potential flood reduction methods – including management and prevention. To educate the public and increase their knowledge on climate change and associated flood risks, various forms of media would be used, including posters and radio broadcasts. In addition, education programmes would be implemented for school children, which would ensure increased long-term public awareness of flood risks and the adoption of appropriate responses during times of crisis.


Theory of Change
Objective: To strengthen the capacity of national and local government authorities to effectively manage and reduce the negative impacts of floods on local communities and infrastructure in Mali.
Outcome 1: Strengthened technical capacity of municipal and village authorities to improve flood early warning systems and dissemination of climate-related risk information
Outcome 2: Addressing flood risk management into medium- and long-term planning process at the local level
Outcome 3: Climate-resilient investment to reduce risks of highly exposed communities
Increased quality and quantity of data as well as flood forecasting techniques
Increased flood awareness
Increased knowledge of risks associated with floods and vulnerability of local communities
Enhanced capacity to implement flood reduction and management interventions
Improved timely transmission of flood risk information to vulnerable local communities
With LDCF-financed interventions
Business-as-usual
Limited capacity of national institutions to effectively predict floods
Limited skills and resources of government authorities at local level (municipalities and villages) to efficiently carry out responsibilities pertaining to flood risk management
Limited capacity to design and implement adaptation measures related to flood management
Limited transmission of weather-related information and warning to the relevant local communities

11. LDCF finances will therefore be used to increase the capacity of the GoM, especially local government structures, to manage the risks of climate-related hazards such as floods. The LDCF-financed project has been designed to respond to Mali's national priorities and will support the implementation of national policies, strategies and plans. The national priorities targeted by the LDCF-financed project are detailed in Appendix 1. The institutional and policy context of this LDCF-financed project is attached as Appendix 3.

12. The objective of the LDCF-financed project is to strengthen the capacity of national and local government authorities to effectively manage and reduce the negative impacts of floods on local communities and infrastructure in Mali. To achieve this objective, the project will support improved planning and decision-making within government authorities to respond to flood risks and hazards. This enhanced capacity of national and local government authorities to plan and implement locally-appropriate flood mitigation strategies will reduce the vulnerability of local communities to the negative effects of floods. The government authorities targeted by the project include *inter alia* the DNH, AEDD, Mali-Météo, DGPC, Directorate General of Territorial Collectivities (DGCT), National Directorate of Agriculture (DNA), National Directorate of Forestry and Water (DNEF), DNACPN, National Directorate of Planning and Development (DNPD), Bureau of Radio and Television of Mali (ORTM), National Directorate of Rural Engineering (DNGR), DRC, DNAT as well as municipal and village advisors. In total, 51 local communities spread across seven communes in the districts of Bamako, Kayes and Mopti will also benefit directly from LDCF interventions.

13. The objective of the LDCF-financed project will be achieved through the delivery of three complementary outcomes. Outcome 1 will increase the availability of data and information to guide the management of flood risks in municipalities and villages selected for LDCF interventions in the districts of Bamako, Kayes and Mopti. Outcome 2 will integrate flood risk management into relevant development planning policies and budgetary processes, thereby increasing the effectiveness of local DRM, DRR and response plans to flood hazards. Outcome 3 will invest in the demonstration of multiple flood reduction measures, including the establishment of infrastructure for flood protection and flood management, to benefit 51 local communities that are vulnerable to flood risks. The site selection process is described in Appendix 4 and the mission report is attached as Appendix 5.

2) The baseline scenario or any associated baseline projects.

14. The LDCF-financed project will build on baseline projects to maximise benefits to the recipient local communities. Five ongoing baseline projects were identified in the country, namely: i) **annual budget of Mali-Météo to cover their operational costs** over the course of the implementation phase (co-financing of US$ 24,690,000); ii) **Project for stormwater drainage in Bamako** (co-financing of US$ 12,327,411); iii) **Project for the management of grey water and solid waste** (co-financing of US$ 4,929,496); iv) **Programme for the support of the National Adaptation Strategy to Climate Change in Mali** (co-financing of US$ 6,000,000); and v) **Support Programme for Environmental Management and the Promotion of Sustainable Development** (PAGEDD, co-financing of US$ 2,500,000). In addition, UNDP will provide a grant in-kind to the value of US$ 800,000 as co-financing for the LDCF-financed project. Letters of co-financing are attached as Appendix 6.

15. As a national meteorological agency, Mali-Météo is responsible for the generation of weather-related information to guide decision-making to protect lives and secure assets in the country. Over the last few years, Mali-Météo has implemented several measures to provide accurate weather-related information in the context of climate change and weather forecasting. The GoM has financially supported the strengthening of the meteorological network and the development of accurate weather forecasts to prevent losses from climate-related hazards. The LDCF-financed project will build on the current initiatives undertaken by Mali-Météo and further reinforce its hydro-meteorological network through the addition of 10 hydrological and meteorological stations, and 150 pluviographs under Outcome 1. The above-mentioned equipment measures the intensity of rain and as such they are useful instruments to predict imminent floods. The

pluviographs financed by the LDCF will increase the quality and quantity of data produced by Mali-Météo thereby enabling monitoring and predictions of floods. In addition, LDCF resources will be used to develop flood EWSs (a total of three) to disseminate early warnings in the intervention sites of Bamako, Kayes and Mopti. The establishment of these systems will strengthen Mali-Météo's capacity to deliver early warnings in the event of floods. The LDCF-financed project will deliver interventions to increase the technical capacity of Mali-Météo's technical staff to monitor weather-related information, analyse and interpret data from climate modelling software to generate accurate downscaled weather forecasts. The **annual budget of Mali-Météo to cover their operational costs** of the relevant activities of Mali-Météo to the LDCF-financed project amount to US$ 4,938,000 which adds up to US$ 24,690,000 considered as co-financing for the five years of project implementation.

16. The **Project for stormwater drainage in Bamako** funded by the GoM/Federal Government of Germany seeks to reduce flood risks in Bamako. This project is implemented by the MEADD from 2015 to 2020 with the objective of decreasing the vulnerability of local communities living in flood-prone areas in Bamako. To do so, the rehabilitation interventions for Tienkolé wetland in commune I and Ouéouyankou wetland in commune IV are undertaken as part of this project. The rehabilitation of these flood-prone wetlands aim to reduce flood risks thereby decreasing the vulnerability of the adjacent local communities. The LDCF-financed project will complement these flood risk reduction interventions implemented in Communes I and IV with the construction of permeable rock dams in these same communes.

17. The **project for the management of grey water and solid waste** implemented by the DNACPN/AGETIPE/CIRA and financed by the GoM is undertaking a study on the existing systems in 11 cities in Mali including Kayes and Mopti. This study is aligned with the LDCF-financed objectives because the inappropriate disposal of waste leads to blocked waterways which increases the risk of flooding following intense rainfall. The LDCF-financed project will build on the work undertaken by this project by undertaking awareness-raising campaigns with local communities on adopting appropriate waste disposal practices under Ouput 2.1.

18. The UNDP **Programme for the support of the National Adaptation Strategy to Climate Change in Mali** focuses on supporting the GoM to adopt an integrated approach to climate change and to support climate change-resilient development in the country – as stipulated in the National Adaptation Strategy to Climate Change in Mali. It is financed by the Federal Government of Germany and commissioned by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMU). With a budget of US$ 6,000,000 for the period 2014-2019, this project aims to increase the resilience of vulnerable local communities to climate change using an integrated approach to adaptation including ecosystem restoration and strengthening of production chains for ecosystem-based resources. Activities financed by the project include *inter alia*: i) the mainstreaming of climate change considerations into existing policies to inform planning; and ii) the identification of best-practice interventions to effectively manage the negative effects of climate change on local communities in collaboration with municipal authorities. In addition, this UNDP project will contribute to the expansion of the weather monitoring network through purchasing weather stations.

19. The LDCF-financed project will build on the interventions discussed above by further increasing the network of weather stations (under Outcome 1) to improve the quality and quantity of weather-related information in the country. In addition, the LDCF-financed project will further the benefits of the **Programme for the support of the National Adaptation Strategy to Climate Change in Mali** by mainstreaming the consideration of short- to medium-term flood risks into the PDESC to inform flood-resilient development planning in the intervention sites(Under Output 2.1.). The LDCF-financed project will build on the work undertaken by the project financed by the GoM/Federal Government of Germany to implement best-practice soft and hard flood risk reduction interventions. These interventions include rehabilitation of wetlands and the construction of permeable rock dams, respectively.

20. The AEDD is responsible for the coordination and the mainstreaming of environmental and climate change considerations in national – such as the PNPE – and sectoral policies. This agency currently implements the **Support Programme for Environmental Management and the Promotion of Sustainable Development** (PAGEDD) to promote sustainable development in the country and to incorporate climate change considerations in development programmes and projects. PAGEDD is implemented on a national scale. The LDCF-financed project will build on the work currently undertaken in Kayes and Mopti to increase the adaptive capacity of local communities. In addition, the work undertaken by PAGEDD in Bamako to improve the management of climate change risks will be furthered.

3) The proposed alternative scenario, GEF focal area strategies, with a brief description of expected outcomes and components of the project.

The three complementary outcomes of the LDCF-financed project are discussed below.

COMPONENT 1: Strengthened technical capacity of municipal and village authorities to improve flood early warning systems and dissemination of climate-related risk information.

OUTCOME 1: Strengthened technical capacity of municipal and village authorities to improve flood early warning systems and dissemination of climate-related risk information.

Co-financing amounts for Outcome 1: US$ 17,936,417
LDCF project grant requested: US$ 3,135,000

Without LDCF Intervention (baseline):

21. Currently, the majority of information and knowledge on the predicted effects of climate change in Mali is generated by regional institutions such as AGRHIMET and ACMAD[34], while several national government authorities are responsible for monitoring and forecasting Mali's climate. These government authorities are also responsible for issuing warnings on climate-related hazards and disasters, such as droughts, floods and locust plagues. The specific duties of these government authorities – including Mali-Météo – are described below.

22. The duties of Mali-Météo include *inter alia*: i) monitoring short- and long-term variables of Mali's weather and climate, such as rainfall and temperature; ii) issuing seasonal weather forecasts to assist farmers with planting preparation of crops during the wet season[35]; and iii) predicting and issuing warnings for climate-related hazards such as droughts. To fulfil its duties, weather data is collected by Mali-Météo from the national meteorological observation network, which comprises 190 synoptic stations, 54 climatological and agro-meteorological stations, as well as 214 rainfall observation systems. The observation network also consists of Meteosat receiver stations – established through the support of WHO[36], EUMETSAT[37] and AGRHIMET – two cloud-seeding airplanes and eight Automatic Weather Stations (AWS). The duties of Mali-Météo are complemented by those of the DNH, which is responsible for collecting and disseminating Mali's hydrological data. The DNH also operates and maintains a network of ~90 water-level observation stations on the Niger and Senegal Rivers. The Hydro-Niger project expanded the hydrological network by equipping 24 stations with telemetry systems, which are partially operational.

23. The meteorological and hydrological monitoring networks established by Mali-Météo and the DNH collect data around large settlements and valuable infrastructure, thereby limiting the spatial coverage of these networks. This reduces the capacity of these institutions to develop downscaled weather predictions.

[34] Ministry of Environment and Sanitation: Environment and Sustainable Development. 2011. Mali climate audit, Bamako.
[35] Ibid.
[36] WHO stands for World Health Organisation.
[37] EUMETSAT stands for European Organisation for the Exploitation of Meteorological Satellites.

In addition, the delay in the transmission of data from hydro-meteorological stations to central offices also constrains the generation of accurate, timely early warnings for floods. As a result of these constraints, detailed spatial analyses of flood risks have not been undertaken, and communities in low-lying areas – including in the districts of Bamako, Kayes and Mopti – do not receive flood early warnings.

24. While Mali has implemented an early warning system for famine[38], no flood EWS has been developed at the national scale in Mali. Instead, the GoM's management approach to reduce the negative effects of floods emphasises community participation in the development and implementation of locally appropriate solutions and strategies. In alignment with this emphasis on community participation, an interdisciplinary working group was developed to collate and disseminate advice and recommendations on locally appropriate flood reduction measures for farming communities. This guidance was well received by the communities and the lessons learned by the interdisciplinary group will inform the development of similar projects in the future. Since this initiative demonstrated the value of community participation in climate-risk management, in 2014 the DGPC undertook a risk identification process in all 703 communes in Mali using a Risk Identification Form/Sheet (FICAR). The purpose of this exercise was to develop a database and map climate risks to inform the development of DRM and DRR interventions. However, this information has not been integrated into development planning processes or authorities' responses to climate-related hazards. Mali's response to flood risks and hazards therefore remains uncoordinated, *ad hoc* and without consideration of the predicted effects of climate change.

With LDCF Intervention (adaptation alternative)

25. The LDCF-financed project interventions will strengthen the capacity of GoM to generate and disseminate information on floods. In particular, this Component of the project will focus on increasing the capacity of both Mali-Météo and DNH to collect, analyse and interpret climate-related data from a network of enhanced hydro-meteorological observation stations that will be established with LDCF resources. The interpretation and analysis of the data generated by these stations will supplement existing hazard mapping by providing: i) an updated analysis of the vulnerability of local communities – see Table 1 overleaf for the list of local communities receiving hydro-meteorological stations – to floods under the predicted conditions of climate change in the short- to medium-term; and ii) the location of infrastructure and public assets located within the project's intervention sites that are at risk of floods. The project will integrate data generated by past initiatives to inform the analyses of localised flood risks. For example, data generated by the DGPC in 2014 through FICAR will be included in the flood risk analyses. Increased availability of quality data and information on site-specific flood risks will inform the development of improved models for predicting vulnerability to floods and for issuing flood early warnings. An EWS for each intervention district – three in total, i.e. Bamako, Kayes and Mopti – will be implemented and will supplement and strengthen existing systems to decrease the vulnerability of local communities to climate-related hazards.

26. Under Outcome 1, the national hydro-meteorological observation network operated by Mali-Météo and the DNH will also be extended through the provision of 10 additional meteorological and hydrological stations as well as 150 pluviographs. The selection of the specific types of monitoring equipment was undertaken in consultation with the National Hydrological and Meteorological Services (NHMS) to identify the most appropriate and cost-effective options for Mali's context. These hydro-meteorological stations will be established in flood-prone areas of the intervention sites subject to an assessment by a national meteorologist. The increased geospatial coverage of Mali's hydro-meteorological observation network will support the increased accuracy and timeliness of weather forecasts and flood early warnings.

[38] An EWS that issues warnings for famine and food security crises has been developed and implemented by the Ministry of Local Authorities under the authority of the Office for Food Security. The primary function of this EWS is to identify the: i) areas and segments of the population that are vulnerable to food crises; ii) timeframe and extent of the expected food crisis; and iii) estimated needs of the affected community to prevent a food crisis. The EWS issues monthly bulletin reports which are reviewed and adopted by a working group. This information is then published and distributed as a newsletter to international, national and local agencies to inform the adoption of recommended measures and prevent potential food crises.

27. Flood risk mapping of the main assets at risk in each intervention district will be undertaken through the activities of the LDCF-financed project. To determine the impact of floods on built infrastructure, an inventory of flood-vulnerable assets and the likelihood of potential damage during flood events will be developed. The information generated by this flood risk analysis will inform a study of the potential socio-economic costs of damage and losses resulting from floods according to different flood risk scenarios.

Output 1.1.: A sound climate information system comprising devices operating 24 hours a day to monitor and forecast flood risks and hazards is established.

28. Under this output, the LDCF-financed project will increase the capacity of Mali-Météo, the DNH, DGPC, AEDD, as well as municipal and village authorities to monitor climate conditions and issue reliable, accurate and timely flood forecasts. The scientific community of Mali – represented by the Abderhame Baba Touré National Education Institution for Engineers (ENI-ABT) – will also increase their knowledge and expertise on climate monitoring.

29. As part of their ongoing operational practices, Mali-Météo undertakes regular assessment of the status of its existing stations and other weather-related equipment. Based on a recent evaluation, Mali-Météo has determined that 10 meteorological and hydrological stations need to extend its network to accurately forecast floods and hazards. Consequently, the strengthening of Mali's hydro-meteorological monitoring network will include the use of LDCF resources to procure and install monitoring equipment, including *inter alia* 10 meteorological and hydrological stations and 150 pluviographs. The meteorological and hydrological stations will measure the increase in water level and rainfall intensity to complement the pluviographs. The information generated by these equipment will determine imminent flood risks in the interventions sites.

30. A national meteorologist will be appointed to determine the appropriate type of meteorological and hydrological stations required to extend Mali-Météo's network. New meteorological and hydrological stations will be installed in 10 local communities in the districts of Bamako – see Table 1 below. The exact location of these stations will be determined by the appointed national meteorologist. This meteorologist will also train the relevant stakeholders on the operation and maintenance of these stations, as well as the monitoring and forecasting of climate-related risks.

Table 1: Number of meteorological and hydrological stations to be installed.

District	Circle	Commune	Number of meteorological and hydrological stations to be installed
Bamako	Bamako	Commune I	2
	Bamako	Commune IV	2
	Bamako	Commune VI	2
Kayes	Bafoulabe	Tomora	1
	Kita	Sebekoro	1
Mopti	Bandiagara	Pignari Bana	1
	Mopti	Fatoma	1

31. The suppliers of the meteorological equipment discussed above will train the relevant officials from Mali-Météo, the DNH, DGPC, AEDD, ENI-ABT as well as municipal and village authorities on the operation and daily maintenance of the equipment. In addition, the suppliers will compile simple technical guidelines on the operation and daily maintenance of the equipment to promote their sustainability. There are, however, several cultural and attitudinal barriers within Mali-Météo that restricts the use of modern technology in the weather sector. This is a result of the emphasis within Mali-Météo on conventional technologies, which are difficult to maintain by the relevant authorities. These barriers have been partially addressed through the participatory approach adopted in the design of the LDCF-financed project. The involvement of Mali-Météo in

the development of the project's interventions – to ensure that LDCF finances are used to address their needs – promotes their support during implementation phase. In addition, these barriers will be overcome through the delivery of training workshops and technical guidelines to explain the benefits of using such technologies to improve the capacity of Mali-Météo's to monitor weather. The training of the technical staff from Mali-Météo will provide the necessary information on operating and maintaining the meteorological and hydrological stations, thereby enhancing their technical capacity and reducing the prevailing attitudinal barriers.

32. By installing the monitoring equipment mentioned above within the project intervention sites, the project will increase the total geospatial coverage of the national monitoring network. This equipment will also provide the necessary data to generate flood forecasts. Mali Météo and DNH will be responsible for operating and maintaining the improved hydro-meteorological network within their ongoing line responsibilities. In addition, Mali-Météo will ensure the sustainability of the long-term operation and maintenance of the procured equipment during the project's lifespan and after its closure. A long-term maintenance plan will be compiled and implemented by the appointed national meteorologist to prevent the degradation of the stations. This long-term maintenance plan will be developed in collaboration with Mali-Météo, the DNH, DGPC, AEDD, ENI-ABT as well as municipal and village authorities.

33. To improve Mali's geospatial coverage of the national monitoring network, the existing weather stations in Kita (Kayes), Sotuba (Bamako), Douentza (Mopti) and Bandiagara (Mopti) will be repaired. These stations have been identified for repair following a regular evaluation of the status of Mali-Météo's stations and equipment. The repair of these stations will improve the quality of weather-related information generated in the country and subsequently communicated to the public. The improved weather monitoring network will therefore increase Mali-Météo's weather monitoring and forecasting capacity.

51. One of the LDCF-financed project's interventions consists of the purchasing of a climate modelling software that will be used to generate accurate downscaled weather forecasting on a national scale. An assessment of the software currently used by Mali-Météo and the demands from the private and public sectors will be undertaken to determine the climate modelling software required. Officials of Mali-Meteo will be trained on the use of the software, methods for data monitoring and the interpretation of the information to generate weather forecasts for the use of the public. Journalists will also be trained to accurately convey the downscaled weather forecasts generated by Mali-Meteo to the population via the radio and TV broadcasting channels – which will require working agreements between Mali-Météo and radio and TV broadcasters. These agreements will be facilitated by a national communication specialist, who will also be responsible for establishing agreements with potential sponsors.

34. In addition to generating information for the general public, the climate modelling software will allow Mali-Météo to produce tailor-made forecasts for specific sectors as a payed service. The need for tailor-made weather forecasts will be determined by a market analyst to identify the opportunities in the private weather forecasting industry in Mali. The market analysis will determine the likely revenue that can be derived from such a service by Mali-Météo. Based on the findings of the market analysis, the appointed international meteorologists will train the relevant Mali-Météo officials on generating such information. The income stream generated by this service will contribute towards maintaining, repairing and/or purchasing new weather stations to improve the quality and quantity of weather-related information in the country.

Indicative activities under Output 1.1 include:

1.1.1. Procure and install 10 meteorological and hydrological stations in the intervention sites – i.e. two stations in communes I, IV and VI of Bamako (six in total), and one in each selected commune in the districts of Kayes and Mopti (4 in total). Training material and guidelines on the operation and maintenance of the equipment installed will be developed and disseminated to the relevant stakeholders. In addition, a long-term maintenance plan for the meteorological and hydrological stations will be developed and implemented.

1.1.2. Procure and install 150 pluviographs in the intervention sites - 50 pluviographs per district. Training material and technical guidelines on the operation as well as a long-term maintenance plan will be developed and disseminated to all the stakeholders operating the pluviographs.

1.1.3. Undertake an equipment needs assessment of the existing weather stations in Kita, Sotuba, Douentza and Bandiagara and repair equipment as required to improve data monitoring and transmission.

1.1.4. Generate accurate downscaled daily, weekly and seasonal weather forecasts for the public. Undertake a market analysis to determine the needs and opportunities in the private weather forecasting industry in the country for downscaled tailor-made weather forecasts. Train the technical staff of Mali-Météo on generating and communicating such information to the private sector.

Output 1.2.: Early warning and quick-response systems are developed to increase the resilience of vulnerable local communities in the intervention sites.

35. LDCF resources will be used to design and implement site-specific EWSs and quick-response systems at the intervention sites. A total of 32 sensors and audible warning devices will be installed as part of the site-specific flood EWSs. These systems will be carefully designed by an international flood EWS specialist to ensure maximum efficiency and coverage. This EWS specialist will also oversee the implementation of the EWSs in each intervention district. The relevant technical staff from Mali-Météo, DNH, DGPC, DNUH, ENI-ABT, as well as municipal and village authorities, will receive training and technical guidelines on operating and maintaining the EWSs. In addition, a long-term maintenance plan will be developed and implemented by the appointed flood EWS specialist to support the sustainability of these systems beyond the project's lifespan. Mali-Météo will assume primary responsibility for the operation and maintenance of the EWSs implemented under this output during and after the project's lifespan. The relevant municipal and village authorities will enter into agreements with Mali-Météo to undertake some of the small-scale maintenance duties on the EWSs.

36. To promote the effectiveness of early warnings, a detailed flood risks and hazards communication strategy will be developed under this output. The design of this communication strategy will involve extensive consultation with local communities to ensure that the early warnings that are generated are in local communities' preferred language and are standardised across all communication platforms. In addition, to increase the capacity of communities to understand and respond to flood warnings, the LDCF-financed project will undertake awareness-raising activities on the interpretation and response to early warning messages.

37. The design of this project's interventions will benefit from the experiences of multiple past and ongoing initiatives – particularly the UNDP Africa Climate Information and Early Warning Project. Although the project mentioned above did not address early warning in Mali, it generated climate information and will provide useful experience-based knowledge and lessons learned on the analysis and dissemination of these information. The LDCF-financed project will also build on the approaches used by existing EWSs in the country – such as the seasonal rainfall forecasts issued by the Mali-Météo – while promoting the use of new and innovative methods for communicating early warnings, such as *inter alia* sirens, SMS, and rural radio broadcasts. To use these channels of communication, MoUs will be developed with radio broadcasters and telecommunication companies. In addition to these communication channels, early warnings will reach rural communities through the monitoring and management committees established under this output – which will target the members of their respective local communities who are outside of reach of the coverage area. Consequently, the use of multiple communication media will support the delivery of warnings to a diverse audience – including local communities located in remote rural areas who might otherwise not receive warnings via conventional media (e.g. newspapers or television broadcasts). Warnings will be adapted based on the level of literacy, education of the target audience, and other variants such as access to technology.

38. The monitoring and management committees established under this output – comprising of representatives of local communities – will work in collaboration with Mali-Météo. These committees will be developed with the appropriate structures and will enter MoUs with Mali-Météo. The primary functions of the monitoring and management committees includes: i) holding regular training workshops with the local communities to increase their understanding of flood risks, their severity and the corresponding response to be adopted, as well as the different categories of warnings according to the flood risks and hazards communication strategy; and ii) disseminating early warnings to members of their respective local communities that are outside of the coverage zone of early warnings. A national communication specialist will be appointed to facilitate the establishment and functioning of the monitoring and management committees and will identify and implement measures – where possible – to make them operational beyond the project's lifespan.

39. Multiple awareness-raising activities and training workshops with representatives of local communities and the media, as well as NGOs and local government authorities will be undertaken. The awareness-raising activities will emphasise the role of the media as an important tool for public education and for disseminating accurate information on the effects of climate change, with a particular emphasis on floods. Training workshops will enhance the capacity of journalists to convey early warnings and other climate-related information in a coherent and accessible approach to the general public.

40. Under this output, a gender specialist will be appointed to support the development of a gender-responsive flood risks and hazards communication strategy. This strategy will be developed in consultation with women from the selected local communities to support: i) the dissemination of early warnings which are readily accessible to women; and ii) the formulation of responses to the different warning categories which are determined by the needs of women. The role of the gender specialist will not be limited to this output alone, but will develop a roadmap for mainstreaming gender considerations into the LDCF-financed activities. This will subsequently support gender equality in the implementation of the project and to promote the participation of women in a meaningful and equitable manner to the project resources. Please refer to Section II for more information.

Indicative activities under Output 1.2 include:

1.2.1. Implement flood early warning audio alert systems comprising 32 sensors and audible warning devices – a total of seven in Bamako, 11 in Kayes and 14 in Mopti – to generate early warnings.

1.2.2. Develop a detailed flood risks and hazards communication strategy based on the input of a gender specialist and in collaboration with the local communities. This strategy will comprise: i) preferred methods of communication of potential flood risks and hazards per commune; ii) the preferred language of warnings; iii) the description of a standardised category of warnings to be used across all means of communication; and iv) commune-specific responses to be implemented by the local authorities and communities for each warning category such as evacuation plans.

1.2.3. Establish monitoring and management committees between the selected communes and Mali Météo to effectively disseminate flood warnings. These committees will also periodically provide training to local communities on the different warning categories and the appropriate responses to be adopted.

Output 1.3.: Risk mapping combining flood risks with socio-economic indicators – including inter alia population-related indices, land value, land uses, assets – is undertaken.

41. A flood risk analysis will be undertaken for each intervention site in Bamako, Kayes and Mopti based on flood risks and exposure – determined under this output. This risk analysis will comprise three datasets, namely: i) flood risks and exposure of local communities within the intervention sites in the short- to medium-term; ii) socio-economic information including *inter alia* population-related indices and sources of livelihoods; and iii) land use information including *inter alia* the location of assets such as public infrastructure – e.g. buildings, roads and bridges – and human settlements. By combining the three datasets mentioned above in GIS, maps showing the location of the vulnerable communities in the short- to medium-term will be

produced. In addition to these maps, the contributing factors to the vulnerability of local communities will be determined from the GIS datasets created. Furthermore, a flood risk index will be developed to facilitate the identification and prioritisation of the local communities requiring DRM interventions to reduce the impacts of floods in the short to medium term. The flood risk maps in conjunction with the index developed under this output will increase the technical capacity of the local government authorities to plan and implement DRM interventions in the intervention sites and to guide development planning. The technical staff from the DGPC, DNPD, AEDD, Mali-Météo, DNH, ENI-ABT, other line ministries as well as municipal and village authorities will receive training on the: i) collection and analysis of the relevant data; ii) development of the datasets; iii) generation of the flood risk maps; and iv) the use of the flood risk maps as planning tools for DRM interventions and development planning.

42. The detailed geospatial datasets developed through the flood risks and exposure analyses undertaken in the intervention sites will be integrated into the AEDD Information System during the project's lifespan. This system was established by the SLWM program, which manages online environmental information. By integrating information – such as the predicted short- to medium-term vulnerability of local communities to floods – into the AEDD Information System, this output will support the consideration of climate change adaptation into the ongoing activities of the AEDD Information System, particularly related to management of land and water resources. The information generated under this output and provided to the AEDD will be made available and accessible to the public. Flood risk maps will be displayed in schools, display boards and municipal and village authorities' offices as part of the awareness-raising campaigns under Activity 1.4.2. These maps will allow members of local communities to enhance their understanding of their vulnerabilities to floods.

43. Under this output, the socio-economic costs of floods will be quantified in the short- to medium-term. Quantifying these costs will inform an assessment of the financial vulnerabilities[39] of the local economy to effectively implement DRM interventions within the interventions sites. In addition, by providing a clear understanding of the costs associated with floods – to both local communities and relevant government authorities – the project's activities will incentivise DRM-related government structures to reduce the risks, and improve the management, of floods. Alternative adaptation options for flood management within the Malian context will also be developed and assessed in collaboration with academic partners such as local universities or research centres. The results of such an assessment will be communicated to the relevant national and local partners at communication events to be included in future NAP-related activities.

Indicative activities under Output 1.3 include:

1.3.1. Determine short- and medium-term flood risks and exposure based on updated and downscaled climate models. Map the areas that are exposed to floods are at risk in the short to medium term.

1.3.2. Collect and analyse socio-economic data based on indicators – including *inter alia* population-related indices, settlement patterns, land uses and value, sources of livelihoods and infrastructure – and determine any projected change scenarios in these variables in the short and medium term.

1.3.3. Develop an inventory of flood-vulnerable assets in the communes selected for LDCF interventions to prioritise DRM interventions.

1.3.4. Undertake short- to medium-term risk mapping using GIS to overlay flood risks and exposure data (as determined in Activity 1.3.1), socio-economic information (Activity 1.3.2) and flood-vulnerable assets (Activity 1.3.3.). Develop a flood risk index to facilitate planning of DRM interventions. The flood risk maps will be made accessible to the public.

1.3.5. Quantify the socio-economic costs of floods in the short to medium term based on risks, vulnerability of local communities and potential loss or damage to assets located in flood-prone areas. The costs and benefits of alternative adaptation options for flood management will be analysed with the engagement of local universities/research centres. The results of this work will be integrated into the ongoing NAP-related activities.

[39] Financial vulnerability is a function of the distribution of risks and financial capacities to absorb the costs to be incurred as a result of climate-related hazards and natural disasters.

Output 1.4: An education programme and awareness-raising campaign is undertaken within schools and local communities to build a culture of safety and resilience to floods.

44. The interventions of this output will entail the integration of an education programme on local climate-related hazards, particularly floods, into the curriculum of schools. This integration will be accomplished through i) raising awareness of inspectors, educational advisors and directors of primary schools about flood risks and the need for climate change adaptation; and ii) producing educational booklets on flood risk and climate change, including modules and manuals for teachers and children. In addition, training workshops will be conducted with the public on designing and implementing locally-appropriate interventions to build resilience to floods. The school curriculum and training workshops discussed above will be developed in collaboration with the DGPC, Ministry of Education, municipal and village authorities, NGOs and CSOs.

Indicative activities under Output 1.4 include:

1.4.1. Develop and integrate an education programme in the school curriculum and raise awareness on the prevention of climate risks, in particular floods, to decrease the vulnerability of school children.

1.4.2. Conduct awareness-raising campaigns through training workshops, radio and TV broadcasts, display boards, skits and SMS on building resilience of local communities to floods.

COMPONENT 2: ADDRESSING FLOOD RISK MANAGEMENT INTO MEDIUM AND LONG TERM PLANNING PROCESS AT THE LOCAL LEVEL

OUTCOME 2: Effective flood risk management mainstreamed into the relevant development planning policies and budgetary processes to increase the resilience of local communities.

Co-financing amounts for Outcome 2: US$ 10,249,381
LDCF project grant requested: US$ 1,514,000

Without LDCF interventions (baseline):

Institutional and technical capacity to address disaster risk management

45. Existing legislation, such as the Local Governance Regulations of 2012, was drafted to promote a decentralised approach to governance in Mali. Under these regulations, local government authorities are empowered to provide public services and infrastructure and participate in activities such as disaster management, as well as to maintain and improve livelihoods under conditions of climate change[40]. In addition, these regulations highlight the potential role that can be played by local government authorities within Mali's 703 communes as part of the national response to climate change[41]. However, the potential contribution of local authorities to decentralised governance is undermined by the limited influence of these stakeholders on high-level decision-making, which is traditionally undertaken by national authorities. For example, the national climate planning process in Mali and the associated funds are managed by national authorities. Local authorities therefore have limited input into the planning process and the allocation of funds for climate change adaptation and mitigation within their respective communes. In addition, although the management of natural resources has been entrusted to local government authorities, they are generally managed by national agencies within the MEA[42]. This has resulted in a limited transfer of skills from national to local government authorities[43], thereby hindering effective DRM planning and implementation at the local level.

[40] National Consultant's Report..
[41] Ibid.
[42] Ibid.
[43] EU. 2014. Update of Mali's environmental profile.

46. In Mali, several government institutions are responsible for developing and implementing DRM activities. These institutions include *inter alia* DGPC, DNH, ABFN, DNACPN, AEDD and DNGR. The DGPC also facilitates the participation of regional and local authorities – such as governors of circles, municipal staff and village advisors – in decentralised DRM activities. However, many of these local authorities have limited capacity to implement DRM interventions. To address this, both the national government and UNDP have delivered training to selected local government authorities to increase their capacity to develop and implement measures to improve local governance and the safety of communities. The training activities are largely related to: i) improving the core competencies of local government authorities and officials to consolidate local development; ii) strengthening social cohesion; and iii) implementing the necessary measures to enhance community safety.

47. Despite ongoing efforts by the GoM and UNDP to increase the institutional and technical capacity of local government structures such as municipalities and village authorities, these institutions have insufficient institutional resources and technical skills to effectively address the adverse effects of climate change in the country. The limited knowledge on topics such as climate change and climate-related hazards within government authorities has led to the inconsistent and *ad hoc* planning of DRM. As a result, climate change and climate-related hazards are not meaningfully considered in development planning. Measures to avoid or manage climate-related risks – particularly floods – have also not been integrated into existing building codes in Mali. The resulting effect is the increased vulnerability of communities in Bamako, Kayes and Mopti – particularly in those areas within these districts where rapid urbanisation has resulted in the expansion of settlements into unsuitable low-lying or flood-prone areas. Under the predicted conditions of climate change, an increase in human deaths, the loss of livelihoods and livestock as well as damage to structures and public infrastructure will occur as the frequency and severity of floods increases in Mali[44].

48. Mali has limited access to software and tools to support decision-making related to the forecasting of floods. The limited availability of skilled human resources, modern equipment and the up-to-date transfer of data from the observation network has undermined the capacity of the country's public authorities to accurately forecast climate-related hazards, such as floods at a local scale. This limited capacity to forecast floods reduces the effectiveness of the DRM interventions. Furthermore, restricted availability of downscaled maps detailing site-specific vulnerabilities to hazards such as floods hinders the development of locally-appropriate flood risk reduction interventions, thereby undermining the effectiveness of Mali's current approach to DRM and climate change adaptation.

Disaster risk management financing mechanism

49. The National Investment Agency for Local Communities (ANICT) was created in 2000 and has invested in a total of 11,792 projects in Mali. Funding from ANICT is used by local government authorities to undertake a suite of interventions to increase access to service delivery in local communities. These interventions, implemented by local government authorities, include improving access to drinking water by constructing wells and boreholes. However, the resources available from ANICT that are prioritised for disaster risk management and emergency relief are limited. In addition, there is currently limited information on the costs associated with the losses and damage caused by floods in the country. As a result, the financial vulnerabilities of the affected communities are not well understood, particularly their: i) exposure to risk; and ii) financial capacity to absorb risks. As a consequence of the knowledge gap on flood-related loss and damage costs in Mali, the Ministry of Finance (MoF) and local financing institutions are insufficiently equipped to use risk financing[45] and risk transfer tools[46] to decrease the financial vulnerabilities of

[44] Pan African Climate Justice Alliance. 2009. The economic cost of climate change in Africa.
[45] Risk financing is defined as "strategies and instruments used to manage the financial impact of disasters, ensuring adequate capacity to manage and mitigate the costs of disaster risk, thereby reducing the financial burden and economic costs of disasters and enabling rapid recovery in economic activity." Source: G20/OECD. 2012. Disaster Risk Assessment and Risk Financing: A G20/OECD methodological framework.
[46] Risk transfer tools are a means to reduce the potentially crippling financial consequences of disasters and to ensure rapid recovery. Source: G20/OECD. 2012. Disaster Risk Assessment and Risk Financing: A G20/OECD methodological framework.

government authorities, businesses and households. Furthermore, the existing DRM financing mechanism comprises state budget allocations, relief funds from municipalities and reallocations from other state departments following disasters. This financing mechanism is not sufficiently developed to address the current and future needs for the implementation of DRM interventions such as flood protection measures in Bamako, Kayes and Mopti. The existing mechanism is also not flexible enough to mobilise the necessary funds for effective disaster management. The establishment of site-specific financial strategies is therefore required to increase the resilience of the local communities to rapid onset hazards such as floods.

With LDCF interventions (adaptation alternative)

50. Under the predicted conditions of climate change in Mali, there will be an increase in the severity and frequency of climate-related hazards. The LDCF-financed project's interventions under Outcome 2 are therefore designed to promote effective DRM planning and implementation in Mali. Activities under this Outcome include reforms to existing policies to increase the effectiveness of flood risk management in the country. This policy reform will include the development and implementation of Flood Risk Reduction Plans (FRRPs) in the project's intervention sites in Bamako, Kayes and Mopti. These plans are fine-scale decision support tools, particular in the context of the municipalities and villages in Bamako, Kayes and Mopti. The FRRPs will include site-specific measures developed in collaboration with local communities to reduce their vulnerability and exposure to floods. This policy reform will support the integration of the FRRPs into local development planning in the districts Bamako, Kayes and Mopti to increase the resilience of the local communities to floods in the short and medium term.

51. Funds from the LDCF will be used to develop financial strategies to facilitate timely access to economic resources by local government authorities to address climate hazards. This increased financial capacity will empower the MoF and local financing institutions to: i) establish a financial mechanism in the country to fund climate-induced DRM interventions including flood protection, response to disasters and reconstruction following climate-related hazards such as floods; and ii) increase the financial resources allocated to climate-induced DRM-related activities in Mali. This will be supported by developing and implementing a suite of complementary interventions as described below.

52. The LDCF-financed project will strengthen the technical capacity of national, regional and local government authorities to develop and implement climate-induced DRM strategies and interventions in response to the current and predicted effects of climate change, particularly floods. Capacity-building will be undertaken within the DGPC and decentralised government authorities in circles and communes. The project's capacity-building activities targeted at the aforementioned authorities will include increasing the technical understanding of climate change, climate variability and climate-related hazards among staff. Through the enhanced technical capacity supported by the project, decision-making processes relating to DRM will be informed by climate-related risks, the vulnerabilities of communities and their adaptive capacities. The technical capacity of government authorities will improve the planning and implementation of DRM-related activities throughout the country. Consequently, the vulnerability of Malians to floods will decrease.

Output 2.1: Commune-specific Flood Risk Reduction Plans (FRRPs) with locally-appropriate strategies and interventions to decrease the vulnerability of local communities to floods are developed.

53. Under this output, FRRPs will be developed for the LDCF intervention sites in Bamako, Kayes and Mopti, in consultation with local communities. In particular, flood risk reduction strategies that are cost-effective and suitable to the Malian context will be developed. The FRRPs will therefore include a suite of cost-effective soft and hard interventions to decrease the vulnerability of the local communities. These plans will also provide the associated indicative costs of the flood risk reduction interventions. To effectively implement these plans, municipal and village authorities, the DGPC, AEDD, DNPD and the ENI-ABT will be

trained. Under this output, simple technical guidelines will also be compiled and disseminated to the municipal and village authorities beyond the interventions sites so that these interventions can be replicated.

54. These plans will provide a framework to coordinate activities related to flood risk reduction and will include detailed descriptions of locally-appropriate interventions to effectively reduce the vulnerability of communities in the interventions sites to floods. These interventions will be based on the underlying causes of the vulnerability of local communities as determined under Activity 1.3.4. The FRRPs will provide detailed strategies to respond to floods – including *inter alia* the establishment of flood reduction measures such as protective barriers – based on the flood risk maps and index. However no resettlement of vulnerable communities will be supported by this LDCF-financed project. Based on the flood risk maps and index produced, national or local authorities may select to resettle vulnerable communities, however, no LDCF resources will be allocated for such activities.

55. To support the increased effectiveness of DRM planning, the plans under this output will be developed in collaboration with a diverse range of participating stakeholders including: i) local communities at Bamako, Kayes and Mopti; ii) regional and local government authorities; and iii) technical government departments related to hydrology, meteorology, rural development, forestry and civil protection. The participation of local communities will promote the adoption of locally-appropriate measures, including traditional methods for flood protection and flood management, and will facilitate a long-term sense of ownership of the project's activities by participating communities. Through the process of engaging local communities in the project's activities, the participation of women will be prioritised wherever possible. This will promote the consideration of gender equality in the design of the FRRPs.

56. The overarching objective of the FRRPs is to promote effective DRM before, during and after floods. To support effective DRM in Bamako, Kayes and Mopti, a clear organisational structure will be established, including the allocation of responsibilities between national, regional and local authorities. The development of the FRRPs will include the consideration of updated weather-related data generated by the hydro-meteorological network, to be strengthened under Component 1 of the LDCF-financed project. Furthermore, the FRRPs will be periodically reviewed and updated – if necessary – to include newly updated information.

57. In addition to the development of FRRPs under this output, LDCF resources will be used to improve the solid waste removal practices in Bamako. Firstly, the existing waste transit depots in Bamako will be reinforced through fencing to prevent the establishment of settlements and the over-spilling of solid waste onto surrounding areas. Secondly, an assessment of the solid waste management and removal practices – including the current operation mode of waste transit depots in Bamako – will be undertaken. The assessment will focus on the practices implemented by local government authorities and by local communities. The findings of this assessment will facilitate the identification of gaps and opportunities in the system. Consequently, a long-term solid waste management plan for the effective removal and processing of solid waste will be developed in collaboration with local government authorities in Bamako. In addition to the local government authorities, the DGPC, AEDD, DNPD and ENI-ABT will be consulted in the development of the long-term solid waste management plan for Bamako. The government authorities mentioned above and the DGCT will be consulted to develop a long-term financing strategy to support the implementation of the solid waste management plan.

Indicative activities under Output 2.1 include:

2.1.1. Conduct a technical assessment of the existing stormwater drainage systems in the selected communes.

2.1.2. Develop commune-specific FRRPs in a participatory manner with local communities. These plans will provide a roadmap to local authorities for the development of best-practice soft and hard adaptation interventions to reduce flood risks.

2.1.3. Improve solid waste management in Bamako by: i) undertaking an assessment of the current waste removal and management systems to identify gaps; ii) reinforcing the fencing around existing waste

transit depots; and iii) undertaking awareness-raising campaigns with local communities on adopting appropriate waste disposal practices to reduce flood risks.

2.1.4. Integrate short- to medium-term flood risks into the existing Economic, Social and Cultural Development Programme (PDESC) for the selected communes.

Output 2.2: Design, harmonise and enhance existing building and settlement codes to decrease vulnerability of local communities to floods.

58. The LDCF-financed project will revise and strengthen existing building and settlement codes by including considerations related to the management and avoidance of short- to medium-term flood risks. Building codes provide the regulations for the construction of buildings and other infrastructure, and settlement codes specify the location of human settlements. In Mali, settlement codes determine land-use plans, which act as development planning tools by the DNPD, DNUH as well as municipal and village authorities. The revised settlement code will restrict development in flood-prone areas in the intervention sites.

59. To revise the existing building and settlement codes in Mali, an assessment of these documents will be undertaken to determine entry points for flood considerations. As a result of this assessment, the necessary revisions will be proposed to the existing building and settlement codes and submitted for approval during the project's lifespan. The land-use plans associated with settlement codes will also be amended and integrated into the PDESC of Bamako, Kayes and Mopti. If deemed necessary by means of the assessment mentioned above, new building and settlement codes will be proposed for the intervention sites. Policy briefs detailing the proposed revisions to the existing building and settlement codes will be compiled and disseminated to the relevant national and local authorities. The DGPC, DNPD, DNUH, AEDD, DGCT, DNAT, as well as municipal and village authorities, will be trained on the proposed revisions made to the codes mentioned above and on their implementation on the ground.

60. The adoption of improved building and settlement codes will support flood-resilient development and reduce the flood-related risk of future loss of lives and damage to infrastructure. The integration of the revised land-use plans into the PDESC will strengthen them as development planning tools. The revisions to building codes – combined with the development of FRRPs under Output 2.1 – will significantly decrease the vulnerability of local communities in Bamako, Kayes and Mopti to current and predicted flood risks.

Indicative activities under Output 2.2 include:

2.2.1. Assess and propose revisions to strengthen existing building, and settlement codes and the associated land-use plans by integrating considerations relating to flood risks into them.

2.2.2. Develop policy briefs to detail the proposed revisions and submit the revised documents for approval. If necessary, develop new building and settlement codes for the intervention sites. Integrate the revised land-use plans into the existing PDESC.

Output 2.3: Financial strategies are developed and implemented to improve the financial capacity of local authorities to respond timely to climate-related hazards, in particular floods.

61. Under this output, an economic impact analysis will be undertaken to assess the financial capacity of local government authorities engaging in risk financing, which will improve their financial resilience to disasters. The analysis will also identify opportunities for comprehensive financial protection strategies for local government authorities and public-private partnerships to undertake risk financing in the Malian context. The results of this analysis will inform improved decision-making in the management of financial resources targeted to addressing climate-related hazards.

62. This output of the LDCF-financed project will also promote the development and implementation of sustainable financial strategies to improve the management of risks related to climate-related hazards, such

as floods. These strategies will be developed based on assessment of the current financing mechanism used by local government authorities to fund disaster relief in Mali. The development and implementation of these strategies will increase the capacity of the MoF and other local financing institutions to effectively contribute to DRM planning and implementation, primarily by increasing the availability of funds for emergency relief efforts in the event of disasters. Through the development of these financial strategies – in collaboration with the MoF, DGCP and DGCT – national and local authorities will have increased availability of funds to support immediate responses to climate-related hazards and natural disasters, such as floods. Funds will also be made available for activities such as emergency response, targeted financial assistance for vulnerable communities, as well as the reconstruction of public assets and infrastructure.

63. Local government authorities – including the MoF, DGPC and the DGCT – will be trained on the financial strategies developed and implemented through the LDCF-financed project. In particular, they will be trained on accessing funds in the event of climate-related hazards and natural disasters. In addition, training workshops will be held with the government authorities mentioned above on the effective management of these funds for disaster relief and to support the prioritisation of finances to those affected by climate-related hazards and natural disasters.

Indicative activities under Output 2.3 include:

2.3.1. Undertake an economic impact analysis to assess risk financing in the Malian context and the financial capacity of the local government authorities within the intervention sites.

2.3.2. Develop and implement rapid commune-specific financial strategies to facilitate assistance to local communities affected by climate-related hazards, in particular floods, and for the reconstruction of public infrastructure.

Output 2.4: The technical capacity of the relevant national and local authorities on climate risk management planning as well as flood prevention and reduction measures is enhanced.

64. Under this output, the technical staff of relevant national government authorities – including i*nter alia* the DGPC, Mali-Météo, DNH, and the AEDD – and decentralised government authorities in circles and communes as well as the ENI-ABT will be provided with training on forecasting and predicting climate-related hazards. The training held under this output of the LDCF-financed project will promote increased accuracy and effectiveness of forecasting climate-related hazards, such as floods, in other outputs of the project. These training activities will be guided by: i) the application of updated climate and weather data information generated by the national hydro-meteorological network, enhanced under Component 1; and ii) information generated by the flood risk mapping under Output 1.3. The training will also focus on increasing the effectiveness of DRM interventions currently implemented by GoM, with a particular focus on flood protection and flood management. Training will include methods to develop and implement effective flood prevention interventions in consideration of the predicted increased frequency and severity of climate--related hazards such as floods.

Indicative activity under Output 2.4 include:

2.4.1. Provide training to the relevant national and local government officials within the targeted communes on climate risk management, preventing and minimising the negative effects of climate-related hazards, in particular floods, on vulnerable local communities.

COMPONENT 3: CLIMATE-RESILIENT INVESTMENT TO REDUCE RISKS OF HIGHLY EXPOSED COMMUNITIES.

OUTCOME 3: Climate-resilient flood risk management and reduction techniques transferred to local communities within the targeted communes to decrease their vulnerability.

Co-financing amounts for Outcome 3: US$ 20,498,763

LDCF project grant requested: US$ 3,851,000

Without LDCF Intervention (baseline):

Limited technical capacity and tools to manage floods

65. Historically, Mali has been affected by droughts and locust invasion hazards, and these events have largely been the focus of DRM interventions in the country. These interventions include *inter alia* the generation of climate information and EWSs to detect, predict, monitor and assess droughts and locust invasions. To strengthen the capacity of the GoM to develop and implement DRM interventions in the country, several initiatives have been established. For example, PRECARIA – a partnership between the GoM, UNDP and the Danish Cooperation – was initiated in 2009 to enhance the capacity of the government to assess natural disaster risk at the community level. In addition to PRECARIA, a UNDP/GEF project entitled "Enhancing national disaster and emergency preparedness, response, and recovery capacity in Mali through a disaster reduction advisor" was implemented to strengthen the capacity of the government to mainstream climate risks in local development plans targeting rural communities.

66. In 2012, a cross-sectoral capacity assessment of existing systems, policies and programs relating to DRR was undertaken under by UNDP, UN Office for the Coordination of Humanitarian Affairs (UN-OCHA), United Nations Children's Fund (UNICEF), World Food Programme (WFP) and Food and Agriculture Organisation (FAO). This assessment resulted in the formulation of a plan to address challenges faced by Mali, including *inter alia* flood risk, food insecurity and locust infestation. Despite the aforementioned initiatives, the DGPC, DNH, and the AEDD have limited technical capacity to manage flood risks and hazards. This is a result of the considerable gaps in flood risk assessment, monitoring and mapping in the country. For example, there is limited understanding of the vulnerability and the level of exposure of local communities and infrastructure to floods, as well as the potential socio-economic damage and losses, in Mali. Consequently, these gaps hamper the capacity of the GoM to effectively plan and implement DRM interventions.

67. The GoM developed a disaster response tool, namely ORSEC, which is a relief plan to be implemented at the national, district, circle and community levels. However, ORSEC primarily addresses drought risks, with limited information provided on long-term flood risk reduction. Consequently, decision-makers within the relevant government institutions, especially at the district, circle and commune levels, have limited information available to effectively plan and implement interventions to reduce flood risks.

68. The traditional flood management measures used in the country include *inter alia* dykes. There are predominantly three types of dykes used, namely: i) traditional dykes without intake or outtake structure; ii) traditional dykes with intake or outtake structure; and iii) large dykes. Traditional dykes without intake or outtake structure are used to protect low-lying areas and are generally destroyed to evacuate water following recession of flood waters. Dykes with intake and outtake structures are generally used to protect flood plains. Large dykes differ from the other two types as they are used to protect large areas, such as agricultural lands and urban areas[47]. Beyond these traditional measures, there is no other flood management infrastructure in the country.

Poor stormwater drainage systems in place

69. In Mali, the majority of peri-urban and rural areas do not have stormwater drainage systems in place[48]. Where there are present, stormwater is managed through a drainage system consisting of canals, open drains and retention ponds. However, inadequate land-use planning and management has led to many areas

[47] Diarra, S., Kuper, M. & Mahé, G. 2004. Integrated flood management case study – Mali: Flood management – Niger River inland delta. Associated Programme on Flood Management, World Meteorological Organisation, Global Water Partnership, Geneva.
[48] Ibid.

dedicated to stormwater management becoming inhabited, resulting in stormwater drainage system being used for solid waste, industrial waste and sewage disposal[49]. These ongoing practices block waterways causing: i) water stagnation, which promotes the breeding of disease vectors such as mosquitoes; ii) degradation of the stormwater drainage system; and iii) floods[50]. As a result of poor maintenance systems, stormwater drains are usually only maintained just before the beginning of the rainy season, which leads to the degradation of the components of the stormwater drainage system.

With LDCF Intervention (adaptation alternative)

70. LDCF finances will be used to transfer flood-resilient practices to national, sub-national and local communities within the intervention sites. To manage flood risks, these practices will comprise both soft and hard interventions to decrease the exposure of local communities to floods. This will provide the DGPC, DNM, and sub-national authorities with enhanced technical capacity to develop and implement flood risk reduction measures to decrease the vulnerability of local communities to floods. Local communities will also be trained on flood risks, as well as the operation and maintenance of the interventions implemented under this Outcome.

71. Increased migration of Mali's population from the north to the south of the country has resulted in many people settling in flood plains formed by river beds and basins, especially in Bamako. It is therefore important to strengthen the resilience of the local communities within flood-prone areas to floods. As vulnerability is a factor of exposure to hazards, LDCF interventions will be implemented to reduce flood risks through interventions that aim to increase water infiltration and decrease soil erosion. To reduce flood risks in the interventions sites in the districts of Bamako, Kayes and Mopti, LDCF finances will be used for revegetation of riparian areas using climate-resilient indigenous species to buffer wetland ecosystems against the negative effects of climate change. The interventions of the project will result in the revegetation of at least 10 km of riparian areas in each of the following communes: I, IV, VI, Tomora, Sébékoro, Pignari Bana and Fatoma. In addition, to prevent floods resulting from the overflowing of waterways after intense rainfalls, a wetland in Pignari Bana – located in the district of Mopti – will be rehabilitated to increase its water holding capacity.

72. The interventions mentioned above will be complemented by hard interventions such as the construction of permeable rock dams, as well as extended and rehabilitated stormwater drainage systems. LDCF financed will be used to extend the stormwater drainage system by 5 km in each commune, as well as rehabilitate and maintain existing drains. This improvement of stormwater drains is required particularly in Bamako where intense rainfalls often result in the flooding of low-lying areas. To optimise the stormwater drainage system, a long-term management plan will be developed and implemented within the intervention sites.

Output 3.1: Flood risk reduction interventions are implemented to increase water infiltration and reduce soil erosion.

73. LDCF finances will be used to decrease flood risks by promoting water infiltration and reducing soil erosion in the intervention sites. To do so, the management of riparian areas of wetlands will be undertaken within the intervention sites. This will largely consist of revegetation of riparian areas, and an assessment will be undertaken to: i) determine the status of vegetation in the riparian areas of wetlands in the intervention sites; ii) determine the extent of revegetation required to effectively reduce flood risks in each intervention site; and iii) identify the appropriate plant species with climate-resilient properties to be used in this initiative. This activity will require the establishment of three plant nurseries – one per intervention district – and will involve the training of members of the local communities to undertake revegetation in the riparian areas of wetlands in their respective communities. Approximately 70 km (at least 10 km per commune) of riparian

[49] pS-Eau. 2013. Stormwater management in the context of urban areas on developing countries.
[50] Ibid.

areas of wetlands in the intervention sites will be managed with LDCF resources. Climate-resilient indigenous plant species will be selected based on their soil binding properties and community-based planting will be undertaken.

74. In addition to the management of riparian areas, the wetland in Pignari Bana (Mopti) will be rehabilitated. Based on consultation with local communities, this wetland was identified as requiring expansion to increase its water holding capacity, thereby reducing flood risks. As a response to the needs of the local community in Pignari Bana (Mopti), LDCF resources will be used to double the water holding capacity of the wetland from ~1,000 m^3 to ~2,000 m^3 by increasing its depth by one metre. To determine the viability of increasing the capacity of this wetland, a feasibility assessment will be undertaken. Moreover, an Environmental Impact Assessment (EIA) will be undertaken to determine the impact of deepening of the wetland on water quality and aquatic life. The rehabilitation of the wetland will be managed in line with the recommendations of the EIA and corrective actions where required.

75. Commune IV in Bamako is surrounded on its western border by Mount Madingues. Local communities located at the bottom of the Mount are flooded regularly as a result of surface runoff following intense rains. To protect these local communities located in flood-prone areas, a network of canals will be created to divert surface runoff into wetlands in Wowowowanko, Farako and Diafaranako, thereby preventing water runoff from reaching local communities situated at the bottom of the slopes of Mount Madingues in commune IV in Bamako. The network of canals will be designed in collaboration with municipal and village authorities, as well as the DNH, the DGPC and ENI-ABT. A feasibility assessment will be undertaken in collaboration with ENI-ABT to determine the viability of the design of the network of canals and the capacity of the wetlands in Wowowowanko, Farako and Diafaranako to hold additional water runoff. The feasibility assessment will also ensure that the network of canals will be designed to reduce current and future flood risks under the predicted conditions of climate change as determined by the downscaled information generated in Output 1.3. An EIA will also be undertaken to determine; i) any potential impacts of the construction and operation of the network of canals on the environment; and ii) the impact on aquatic life as a result of increased runoff in the wetlands in Wowowowanko, Farako and Diafaranako. If required, the design of the network of canals will be amended to conform to the recommendation of the EIA.

76. A long-term maintenance plan will be developed and implemented to ensure the sustainability of the network beyond the project's lifespan. Training on the long-term maintenance plan will be provided to: i) government authorities including the DNH, DGPC, and municipal and village authorities; ii) representatives from ENI-ABT; iii) NGOs; and iv) CSOs. This plan will be detail the role of each stakeholder involved in maintaining the network of canals, their respective responsibilities and allocated timeframes to undertake their tasks.

Indicative activities under Output 3.1 include:

3.1.1. Rehabilitate the wetland in Pignari Bana to increase its water holding capacity.

3.1.2. Rehabilitate at least 10 km of riparian areas of wetlands with climate-resilient indigenous plant species in each of the seven communes selected for LDCF intervention (70 km in total).

3.1.3. Develop a network of canals to channel water runoff from Mount Madingues in commune IV in Bamako into wetlands located in Wowowowanko, Farako and Diafaranako.

Output 3.2: Flood risk reduction interventions are implemented to reduce the vulnerability of human lives and infrastructure.

77. Hard interventions such as permeable rock dams and stormwater drains will be constructed to decrease the vulnerability of local communities to floods, thereby securing their lives, livelihoods and protecting current and future infrastructure. Permeable rock dams are low rock walls spread over a long distance that cause runoff to spread from a waterway. This technique reduces the velocity and the erosive potential of floodwaters while enhancing groundwater recharge within the enclosed area. The spreading of

floodwaters causes siltation of fertile deposits which promotes increased crop production after the water has receded. This intervention will require a feasibility assessment to determine the appropriate location of these permeable rock dams to maximise their efficiency, thereby decreasing the vulnerability of local communities to floods.

78. Technical guidelines will be produced on the purpose of these rock dams and disseminated to other municipal and village authorities. In addition, training of the technical staff of the DNH, DGPC, and municipal and village authorities, as well as members of local communities, will be held on maintaining the network of canals to ensure their effectiveness as per the long-term maintenance plan developed and implemented for the permeable rock dams, financed by the LDCF. This plan will detail the role of each stakeholder involved in maintaining the permeable rock dam, their respective responsibilities and allocated timeframes to undertake their tasks. The development and implementation of this plan will occur during the project's lifespan.

79. As functioning stormwater systems reduce flood risks, LDCF finances will be used to extend, rehabilitate and maintain the existing systems in the communes I, IV, VI, Sébékoro and Fatoma. The system in each of the above mentioned communes will be extended by 5 km to improve stormwater reticulation, thereby reducing flood risks. A feasibility assessment will be undertaken to determine the best location for the construction of the drains based on the maps generated under Activity 2.1.2. These maps will also be used to determine the priority areas in which drains need to be rehabilitated and maintained for optimum operation. Following the identification of the priority areas, rehabilitation and maintenance of the existing stormwater drainage systems will be undertaken. To ensure the long-term viability of the systems, commune-specific long-term maintenance plans will be developed and implemented. These plans will be developed in collaboration with local communities and sub-national government authorities and will formalise partnerships between the relevant stakeholders. These partnerships will promote the ongoing maintenance of stormwater drainage systems. Similarly to the long-term maintenance plan for the permeable rock dams discussed in this output, this plan will detail the role of each stakeholder involved in maintaining the canals, their respective responsibilities and allocated timeframes to undertake their tasks.

Indicative activities under Output 3.2 include:

3.2.1. Undertake a feasibility assessment for the construction of permeable rock dams in the intervention sites.

3.2.2. Undertake a feasibility assessment for the construction of 25 kilometres of stormwater drains. This activity will be based on Output 2.1. and will include the construction of five kilometres of stormwater drains in communes I, IV, VI, Sébékoro and Fatoma.

3.2.3. Clean and maintain existing stormwater drains in the targeted communes.

4) Innovativeness, sustainability and potential for scaling up.

80. The concept of sustainability has been a central tenet in the design and development of this LDCF-financed project. The following paragraphs describe how the sustainability of the project interventions has been promoted during their design:

81. The project interventions were developed through extensive consultation with various government stakeholders at the national level including the DGPC, DNH, Mali-Météo, DGCT, DNPD and the AEDD. As a result, development priorities of the relevant sectors have been considered in the design of the project. In addition to the consultation of central government stakeholders, the following groups were involved in the development of this project including: i) sub-national institutions such as communal, municipal and village authorities; ii) members of the local communities from each intervention site; iii) NGOs, in particular women's groups; iv) CSOs; and v) tertiary education institutions (see Appendix 5 for the mission report). Stakeholder consultations that were undertaken during the PPG phase and will continue during project implementation support country ownership of the project thereby promoting the maintenance of the project outputs beyond the duration of the project.

82. The focus on improved DRM planning and implementation in this LDCF-financed project will strengthen the capacity of national and local government authorities to plan and implement climate-risk reduction measures in the short, medium and long term. Planning tools such as flood risk maps and FRRPs developed in this LDCF-financed project will improve decision-making capacity of government authorities by enabling them to prioritise DRM interventions in the most vulnerable communities.

83. As there is limited technical capacity to address flood risks within national and local government authorities, this LDCF-financed project emphasises training of government officials in several activities. Under Component 1, the technical staff from Mali-Météo, DNM, DGPC, AEDD, DNPD as well as communal, municipal and village authorities will receive training on monitoring and forecasting climate-related risks. Similarly, under Component 2, the relevant government officials will receive training on developing and interpreting flood risk maps as a flood risk planning tool to secure lives and livelihoods as well as protect existing infrastructure. Component 3 will deliver several training activities to government officials on developing and implementing on-the-ground flood risk reduction interventions to increase the resilience of local communities. The three components of the LDCF-financed project will collectively increase the technical capacity of national and local government authorities to address flood risks effectively.

84. The sustainability of LDCF-financed interventions pertaining to new equipment – for example the meteorological and hydrological stations under Component 1, and hard infrastructures built under Components 2 and 3 – is promoted through delivering training activities, the dissemination of simple technical guidelines as well as long-term maintenance plans. To promote sustainability of the interventions implemented, these plans will be developed in a participatory manner with the relevant stakeholders to increase their support for the long-term maintenance of the equipment installed. The long-term maintenance plans will detail the Terms of Reference (ToRs) along with the relevant timelines for each stakeholder involved in maintaining the equipment – both at the technical and the financial levels – financed by the LDCF. These plans will be implemented during the project's lifespan. Moreover, support will be provided to the stakeholders involved in maintaining the equipment through the implementation of training activities. The training activities, technical guidelines and participatory development of the long-term maintenance plans will be targeted at the government or non-government stakeholders.

85. Ownership of the project by the beneficiaries will be promoted by embedding local communities into decision-making throughout the project implementation phase. This intense participation process will ensure that on-the-ground project interventions directly address community needs. Additionally, an education programme and an awareness-raising campaign will be implemented under the project. The education programme will target 1 to 2 schools in each commune where multiple and varied activities will be implemented. The awareness-raising campaign will use several communication tools and streams such as pamphlets, advertising sign, creative workshops, radio and TV. These interventions will raise the support of local communities within and outside of the intervention sites thereby promoting the sustainability of – and supporting the upscaling of – the LDCF-financed project interventions.

86. This country-driven LDCF-financed project addresses major national priorities. It is therefore assumed that national and local government authorities will be willing to replicate best DRM practices in other vulnerable sites. To enable and facilitate the replication of the relevant project interventions, government officials from several ministries – including *inter alia* the environment, civil protection, forestry, water, decentralisation and planning – will receive extensive training (~US$ 400,000 of LDCF funds allocated to training and capacity-building) on the approach in the project to reduce vulnerability of local communities to floods in the intervention sites. For example, training workshops will be complemented by the dissemination of informative material such as technical guidelines on the construction and maintenance of permeable rock dams to widen stakeholders' coverage of such information and extend the benefits of training activities. Along the same line, training activities on monitoring and forecasting of climate-related hazards, flood risk mapping as well as the development and implementation of flood risk reduction interventions will support the

implementation of flood-resilient development planning in other vulnerable sites in Mali. Additionally, it is expected that the strengthening of institutional and financial capacity among main government stakeholders will promote the mainstreaming of flood risks into cross-sectoral and sectoral policies, and into sectoral planning and decision-making in the long term. This increased capacity is likely to promote the implementation of flood risk reduction interventions on the ground.

87. Under Component 2 of the LDCF-financed project, commune-specific financial strategies will be developed to expedite disaster relief and for the reconstruction of public infrastructure. The increased financial capacity of the local government authorities within the intervention sites will increase their access to funds to effectively manage the effects of climate-related hazards and natural disasters. This will support the timely response to climate-related hazards and natural disasters. The replication of such financial strategies to other local government authorities in the country will significantly strengthen Mali's response to climate-related hazards and natural disasters. Timely disaster relief has several benefits including the prevention of the spreading of diseases and the rapid reconstruction of public infrastructure to enable the undertaking of economic activities.

A.2. Child Project? If this is a child project under a program, describe how the components contribute to the overall program impact.

A.3. Stakeholders. Identify key stakeholders and elaborate on how the key stakeholders engagement is incorporated in the preparation and implementation of the project. Do they include civil society organizations (yes ☒ /no☐)? and indigenous peoples (yes ☐) /no☒)?

88. The implementation strategy for the LDCF-financed project includes extensive stakeholder participation. Details of the stakeholder participation during the PPG phase are provided in Section II. Table 2 below proposes a stakeholder involvement plan for the implementation phase. This will be further developed and validated during the project inception workshop.

Table 2: Relevant stakeholders identified for engagement by project output.

Outcome	Output	Stakeholder	Key responsibilities
Outcome 1: Strengthened technical capacity of municipal and village authorities to improve flood early warning systems and dissemination of climate-related risk information.	**Output 1.1.** A sound climate information system comprising devices operating 24 hours a day to monitor and forecast flood risks and hazards is established.	Mali-Météo; DNH; DGPC; AEDD; Municipal and village authorities; and ENI-ABT.	Install new and rehabilitate existing meteorological and hydrological stations. Monitor climate-related information. Develop meteorological services.
	Output 1.2. Early warning and quick-response systems are developed to increase the resilience of vulnerable local communities in the intervention sites.	DGPC; Mali-Météo; DNH; Municipal and village authorities; DNUH; and ENI-ABT.	Implement a flood EWS in the intervention sites. Develop and disseminate a plan for the communication of flood risks and hazards. Develop commune-specific responses such as evacuation plans.
	Output 1.3. Flood risk mapping combining risks with socio-economic indicators – including inter alia population size, land value, land uses, assets – is undertaken.	DGPC; DNPD; DNH; AEDD; Mali-Météo; ENI-ABT; DGCT; Other line ministries; and Municipal and	Use climate models to determine short- to medium-term climate risks, particularly for floods. Collect and analyse socio-economic data in the communities selected for LDCF interventions. Undertake flood risk mapping by combining flood risks and socio-economic data in the intervention sites.

		village authorities.	
	Output 1.4. An awareness-raising campaign is undertaken within local communities and schools to build a culture of safety and resilience to floods.	DGPC; Ministry of Education; and Municipal and village authorities.	Conduct awareness-raising campaigns in schools on the impact of floods and decreasing climate risks. Provide training workshops to members of local communities on decreasing their vulnerability to floods. Use other means of communication and platforms to raise awareness of local communities to floods.
Outcome 2: Effective flood risk management mainstreamed into the relevant development planning policies and budgetary processes to increase the resilience of local communities.	**Output 2.1.** Commune-specific Flood Risk Reduction Plans (FRRP) with locally-appropriate strategies and interventions to decrease the vulnerability of local communities to floods are developed.	Municipal and village authorities; DGPC; AEDD; DNPD; ENI-ABT; and DGCT.	Propose the necessary revisions to the Economic, Social and Cultural Development Programme (PDESC) to incorporate short- to medium-term flood risks. Undertake a technical assessment of the existing stormwater drainage system. Conduct awareness-raising campaigns on appropriate waste disposal and sanitation methods. Secure and manage waste transit depots to improve solid waste management in Bamako.
	Output 2.2. Design, harmonize and enhance existing building and settlement codes to decrease vulnerability of local communities to floods.	DGPC; DNPD; AEDD; DNUH; Mali-Météo; DGCT; DNAT; and Municipal and village authorities.	Evaluate the existing building codes in the selected communes. Determine entry points to strengthen the building codes by mainstreaming climate considerations into them. Propose revisions to existing building codes to prevent flood-related damages.
	Output 2.3. Financial strategies are developed and implemented to improve the financial capacity of local authorities to respond timely to climate-related hazards, in particular floods.	MoF; DGPC; DGCT; ENI-ABT; DGCT; and Municipal and village authorities.	Assess the current financing mechanism used for disaster relief. Develop and implement financing strategies.
	Output 2.4. The technical capacity of the relevant national and local authorities on climate risk management planning as well as flood prevention and reduction measures is enhanced.	AEDD; DGPC; ENI-ABT; DGCT; Mali-Météo; DNH; and Municipal and village authorities.	Targeted training on planning, developing and implementing risk reduction measures.
Outcome 3: Climate-resilient flood risk management and reduction techniques transferred to local communities within the targeted communes to	**Output 3.1.** Flood risk reduction interventions are implemented to increase water infiltration and reduce soil erosion.	DGPC; DNH; DNACPN; NGOs; ENI-ABT; CSOs; and Municipal and village authorities.	Rehabilitate and increase the water holding capacity of an existing wetland in Pignari Bana. Revegetation of riparian areas with climate-resilient indigenous species.

decrease their vulnerability.	**Output 3.2.** Flood risk reduction interventions are implemented to reduce the vulnerability of human lives and infrastructure.	DGPC; DNH; ENI-ABT; NGOs; CSOs; and Municipal and village authorities.	Extend the existing stormwater drainage system. Improve the existing stormwater drainage system by cleaning and maintaining the drains.

A.4. Gender Equality and Women's Empowerment. Elaborate on how gender equality and women's empowerment issues are mainstreamed into the project implementation and monitoring, taking into account the differences, needs, roles and priorities of women and men. In addition, 1) did the project conduct a gender analysis during project preparation (yes ☐ /no ☒)?; 2) did the project incorporate a gender responsive project results framework, including sex-disaggregated indicators (yes ☒ /no ☐)?; and 3) what is the share of women and men direct beneficiaries (women 50%, men 50%)?

89. In 2014, Mali was ranked as a country with a "very high level of discrimination" in the Social Institutions and Gender Index developed by the Organisation for Economic Co-operation Development Centre[51]. Although the National Gender Policy of Mali was adopted in 2010, customary practices in the country support gender inequalities and disparities[52]. Women in Mali have different access to income-generating activities than men. Indeed, women's roles are predominantly related to childcare and domestic life including raising children, water collection and wood harvesting[53]. Furthermore, as a result of unequal access to education and the labour market, women are more vulnerable to climate-related hazards.

90. The LDCF-financed project will take gender consideration into account and encourage as much as possible women participation to and benefits from the project interventions. Therefore, particular attention will be given to addressing the vulnerability and limited adaptive capacity to floods of both men and women. For example, women will be supported to participate to the monitoring and management committees to be established under Output 1.2. As a result of women participation, decision-making processes regarding the implementation of a strategy to decrease community vulnerability to climate-related hazards will take into consideration men and women livelihoods, expectations and priorities. In addition, to support gender-sensitive interventions, the collaboration initiated with CAFO at PPG phase will continue throughout the implementation phase.

91. As women's domestic life in Mali relate largely to raising children, water collection and wood harvesting, they become relatively more burdened than men in the event of floods. During floods, potable water sources – surface- and groundwater – become susceptible to contamination by microorganisms such as bacteria, sewage, agricultural or industrial waste, chemicals and other substances that can cause serious illnesses. Consequently, women have to walk relatively longer distances to collect water from areas that are not affected by floods to access safe potable water. In addition, water- and vector-borne diseases, such as cholera and malaria[54] respectively, spread rapidly after floods which affect children more than other population groups. As it is largely women's role to raise children, they are further burdened by floods as they have to attend to sick children. In light of the above, this LDCF-financed project has adopted a gender-sensitive approach by reducing and managing the impacts of floods in the country. The LDCF-financed project is therefore intrinsically gender-sensitive and will improve the quality of life of the women in the

[51] The following parameters were measured as part of this index: i) discriminatory family code including lower age of marriage, parental authority and inheritance for women (Mali score: very high); ii) restricted physical integrity that assess the legal framework against domestic violence, rape, sexual harassment as well as genital mutilation and reproductive autonomy (Mali score: very high); iii) son bias measuring female infanticide or health conditions (Mali score: high); iv) restricted resources and assets including access to land and non-land assets, and financial services (Mali score: medium); and v) restricted civil liberties comparing access to public place and political voice (Mali score: very high). http://www.oecd.org/dev/development-gender/BrochureSIGI2015-web.pdf

[52] UNDP. 2012. Gender equality and women's empowerment in public administration. Mali: Case Study.

[53] USAID. 2015. Addendum to the 2012 Gender Assessment.

[54] Ministry of Environment and Sanitation: Environment and Sustainable Development Agency. 2011. Mali climate audit.

intervention sites. The needs and priorities of women have therefore been considered and integrated in the design of this project.

92. A local gender specialist will be appointed under Activity 1.2.2 to support the use of a gender-sensitive and gender-responsive approach in developing the flood risk communication strategy. The scope of the works of the gender specialist will not be limited to Activity 1.2.2 alone but will undertake an evaluation of the LDCF-financed activities and provide a roadmap for promoting a gender-responsive approach throughout the project. The project team will report to the project board on how these recommendations have been included in the subsequent implementation of the LDCF-financed interventions. The gender specialist will develop additional gender-sensitive indicators for the relevant activities which will be monitored by the appointed M&E specialist in the Project Management Unit (PMU). Based on an assessment of the gender-responsiveness of the LDCF-financed activities, gender equality in accessing project's resources and the meaningful participation of women in the implementation phase, corrective interventions will be recommended. Moreover, the gender specialist will develop detailed indicators for the activities undertaken under Outputs 1.3 and 2.1 which pertain to flood risk mapping and the development of flood risk reduction plans, respectively. The flood risk mapping exercise will determine the flood risk reduction interventions to be prioritised and implemented by local government authorities. It is therefore crucial that the socio-economic information collected under Output 1.3 is gender-sensitive as it will enable the development of gender-sensitive and gender-responsive flood risk reduction plans to decrease the vulnerability of women to floods in the future.

93. In addition to the flood risk maps and flood risk reduction plans, gender-responsive campaigns to raise awareness on building resilience to floods and adopting adequate solid waste disposal practices under Activities 1.4.2 and 2.1.5 will be undertaken. As their role pertain largely to raising children, women in Mali are likely to instil their increased knowledge on floods – including the underlying causes of floods and adaptation options – to their children. For example, as women adopt the adequate solid waste disposal practices following awareness-raising campaigns, their children – exposed to such practices – are likely to embrace them in the future.

94. Gender-sensitive indicators and targets have been developed to monitor the progress of the LDCF-financed project and will be refined by the baseline study. Gender-disaggregated data will be collected during project implementation to inform and update the project indicators. Furthermore, up to 50% participation of women (to be determined by the baseline study) will be targeted for each training activity as a prerequisite to hold the event. Trainers appointed by this project will be required to have the required skills and experience to plan and facilitate gender-sensitive training. The set of communication tools under Output 1.4 will also be selected in order to reach men and women similarly. Lastly, awareness raising on gender equity in the context of climate change will be incorporated into the training of government officials to encourage the implementation of gender-sensitive initiatives beyond the project lifespan.

A.5 Risk. Elaborate on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, the proposed measures that address these risks at the time of project implementation.(table format acceptable):

Table: Risk table.

Project risks					
Description	**Type**	**Impact & Probability**	**Mitigation measures**	**Owner**	**Status**
Unclear distribution of the roles for the maintenance of meteorological and hydrological stations,	Operational	P= 3 I= 3	- Simple technical guidelines on operation and maintenance will be compiled by the relevant specialist and/or supplier. - Training workshops on the operation and maintenance of equipment, stations and	AEDD	No change

pluviographs, network of canals to divert water, permeable rock dams, and stormwater drains.			systems implemented under the LDCF-financed project. - Long-term maintenance plans including identification of stakeholder roles and funding sources will be developed for meteorological and hydrological stations, pluviographs, network of canals to divert water, permeable rock dams, and stormwater drains implemented under this project to promote their maintenance and/or management by the relevant authorities beyond the project lifespan.		
Insufficient support from the beneficiary communities to implement the project successfully as benefits are not apparent immediately and only become evident in the event of floods.	Organisational	P= 2 I= 4	- The LDCF-financed interventions were developed through multiple stakeholder consultations with local communities in November 2015. - Extensive engagement of local communities in decision making will be pursued throughout the implementation phase. - Where possible, local labour will be sourced to increase their support. - Tangible and visible activities that addressed community priorities will be implemented early during the project implementation phase. - The Technical Assistants appointed as part of the Project Management Unit in each site will maintain strong communication link with the project beneficiaries, manage expectations of local communities, and ensure alignment of project results, targets and benefits with communities' needs.	AEDD DGPC	Increasing
Limited coordination among government authorities.	Operational & Strategic	P= 2 I= 4	- The project will be implemented according to management arrangements as described in Section VII of this Project Document. The project management arrangement as currently established promote coordination of government authorities – including *inter alia* the DGPC, Mali-Météo, DNH, DGCT, and municipal and village authorities – on the Project Board. The chair of the Project Board, the CNCC, will intervene and implement the remedial actions if limited coordination among government authorities hinder the progress of the LDCF-financed project.	AEDD	Decreasing
Inadequate coordination between national and local (communal, municipal and village) authorities.	Operational & Strategic	P= 2 I= 3	- Among the roles of the Project Coordinating Unit (see Section VII of this Project Document), it is clearly stated that it is responsible for the coordination between national government departments and decentralised institutions such as communal, municipal and village authorities. - Representatives of national and local authorities will participate in the Project Management Unit meetings which will be used as a platform to ensure sufficient communication between and within institutions.	AEDD	Decreasing

Project interventions are not gender-sensitive and gender-responsive.	Strategic	P= 1 I= 3	- Ensure that the project team is familiar with the gender mainstreaming manual developed by UNDP. - Promote the inclusion of women groups in the Project Board to support the implementation of the project activities in a gender-sensitive manner. - The inclusion of gender-sensitive indicators in the results framework promotes gender considerations in the development and implementation of LDFC-financed interventions (see Section II of this Project Document).	AEDD	Decreasing
Insufficient political and financial support from the GoM.	Political	P= 1 I= 3	- The LDCF-financed project is country-driven and was developed based on the consultations of government departments. - Reducing vulnerability to floods to secure lives and assets in Mali is a priority of the GoM.	AEDD MoF DGCT	No change
Interventions in the district of Mopti are delayed by ongoing conflicts.	Political	P= 1 I= 3	- Although there have been a few incidents with insurgent groups in Mopti over the last year, the majority of conflicts occur in the northern parts of the country. The Technical Assistant based in Mopti will monitor the local situation and report to the Project Coordinator and the Project Board to determine if LDCF-financed interventions needs to be amended for security reasons.	AEDD DGPC	Increasing
Climate hazards delay the implementation of project interventions.	Environmental	P= 2 I= 4	- Project activities that are particularly sensitive to climate conditions such as the construction of hard infrastructure will be carefully scheduled taking into account rainfall partners and forecast. This will include collaboration with Mali-Météo.	Mali-Météo DNH AEDD DGPC	Increasing

The UNDP Social and Environmental and Social Screening Template is attached as Appendix 7.

A.6. Institutional Arrangement and Coordination. Describe the institutional arrangement for project implementation. Elaborate on the planned coordination with other relevant GEF-financed projects and other initiatives.

95. Roles and responsibilities of the project's governance mechanism: The project will be implemented following UNDP's National Implementation Modality, according to the Standard Basic Assistance Agreement between UNDP and the GoM, and the Country Program Action Plan (CPAP). The project will be implemented over a period of five years (60 months) by the AEDD which is the **Implementing Partner (**also known as the Project Executive). The AEDD will be responsible for the planning, coordination and implementation of the LDCF-financed project. As the Implementing Partner, it will also be responsible for reporting to the UNDP Country Office in Mali. The Implementing Partner is responsible and accountable for managing this project, including the monitoring and evaluation of project interventions, achieving project outcomes, and for the effective use of UNDP resources. The AEDD will establish a Project Management Unit in Bamako which will comprise a Project Coordinator, Project Finance and Administration Officer, Monitoring and Evaluation Officer as well as three Technical Assistants (also known as focal points).

96. The Implementing Partner will take overall responsibility for the project implementation, and the timely and verifiable attainment of project objectives and outcomes. It will provide support to, and inputs for, the

implementation of all project activities. The highest authority of the Implementing Partner will serve as the National Project Director (NPD) for the project implementation. The NPD will chair the Project Steering Committee (PSC), and be responsible for providing government oversight and guidance to the project implementation The NPD will not be paid from the project funds, but will represent a government in kind contribution to the Project. The NPD will be technically supported by an international Chief Technical Adviser (CTA). The CTA will support the provision of the required technical inputs, reviewing and preparing Terms of Reference and reviewing the outputs of consultants and other sub-contractors. The CTA will be recruited using standard UNDP-CO recruitment procedures and will report directly to the NPD.

97. The **National Steering Committee** is the group responsible for making by consensus management decisions for a project when guidance is required by the Project Coordinator, including recommendation for UNDP/AEDD approval of project plans and revisions. In order to ensure UNDP's ultimate accountability, NSC decisions should be made in accordance to standards[55] that shall ensure best value to money, fairness, integrity transparency and effective international competition. In case a consensus cannot be reached, final decision shall rest with the UNDP Programme Manager. Project reviews by this group are made at designated decision points during the running of a project, or as necessary when raised by the Project Coordinator. This group is consulted by the Project Coordinator for decisions when Project Coordinator's tolerances (normally in terms of time and budget) have been exceeded. The terms of reference for the NSC are contained in Appendix 8. The NSC is comprised of the following individuals:

Composition and organisation: The NSC contains three roles, including:

i. An **Executive**: individual representing the project ownership to chair the group. The Executive is the AEDD who will report to the NSC twice a year on the progress of the project and the emerging results.
ii. **Senior Supplier**: individual or group representing the interests of the parties concerned which provide funding and/or technical expertise to the project. The Senior Supplier's primary function within the NSC is to provide guidance regarding the technical feasibility of the project. The Senior Suppliers include representatives from Mali-Météo, DNH, and DGPC, NGOs, CSOs, municipal and village authorities, and local communities.
iii. **Senior Beneficiary**: individual or group of individuals representing the interests of those who will ultimately benefit from the project. The Senior Beneficiary's primary function within the NSC is to ensure the realization of project results from the perspective of project beneficiaries. The Senior Beneficiary group includes representatives of AEDD, Mali-Météo, municipal and village authorities, local communities, NGOs, and CSOs.

98. Based on the approved Annual Work Plan (AWP), the NSC may review and approve project quarterly plans when required and authorises any major deviation from these agreed quarterly plans. It is the authority that signs off the completion of each quarterly plan as well as authorizes the start of the next quarterly plan. It ensures that required resources are committed and arbitrates on any conflicts within the project or negotiates a solution to any problems between the project and external bodies. In addition, it approves the appointment and responsibilities of the Project Coordinator and any delegation of its Project Assurance responsibilities.

99. Potential members of the NSC are reviewed and recommended for approval during the PAC meeting. For example, the Executive role can be held by a representative from the Government Cooperating Agency or UNDP, the Senior Supplier role is held by a representative of the AEDD and/or UNDP, and the Senior

[55] UNDP Financial Rules and Regulations: Chapter E, Regulation 16.05: a) The administration by executing entities or, under the harmonized operational modalities, implementing partners, of resources obtained from or through UNDP shall be carried out under their respective financial regulations, rules, practices and procedures only to the extent that they do not contravene the principles of the Financial Regulations and Rules of UNDP. b) Where the financial governance of an executing entity or, under the harmonized operational modalities, implementing partner, does not provide the required guidance to ensure best value for money, fairness, integrity, transparency, and effective international competition that of UNDP shall apply.

Beneficiary role is held by a representative of the government or civil society. Representative of other stakeholders can be included in the NSC as appropriate.

100. The project organisation structure is as follows:

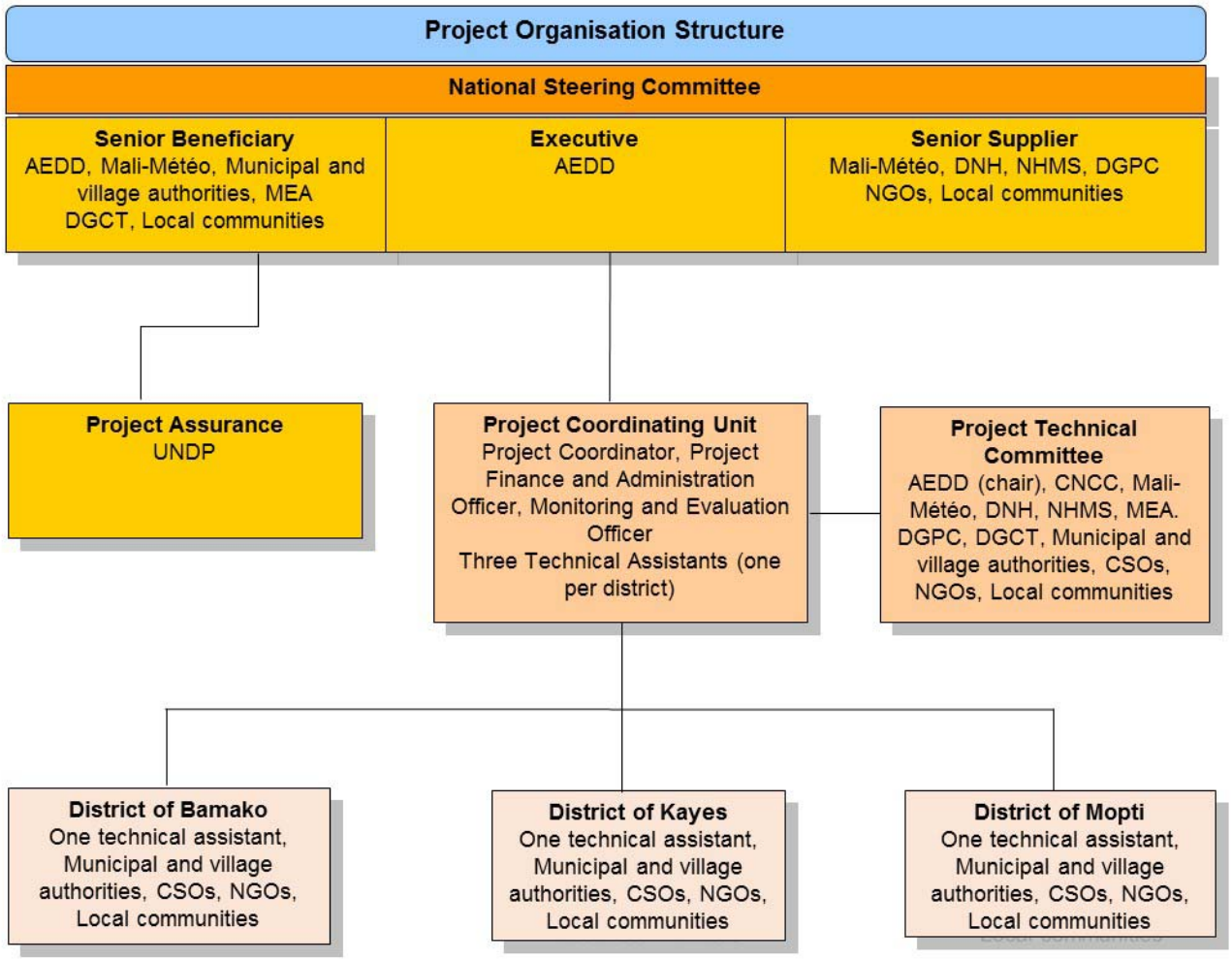


Figure 1: Organogram of management arrangements for the LDCF-financed project.

101. The specific responsibilities of the NSC are as follows:

Defining a project

- Review and approve the Initiation Plan (if such plan was required and submitted to the PAC).

Initiating a project

- Agree on Project Coordinator's responsibilities, as well as the responsibilities of the other members of the Project Coordinating Unit (PCU).
- Delegate any Project Assurance function as appropriate.
- Review the Progress Report for the Initiation Stage (if an Initiation Plan was required).
- Review and appraise detailed Project Plan and AWP, including Atlas reports covering activity definition, quality criteria, issue log, updated risk log and the monitoring and communication plan.

Running a project

- Provide overall guidance and direction to the project, ensuring it remains within any specified constraints.
- Address project issues as raised by the Project Coordinator.
- Provide guidance and agree on possible countermeasures/management actions to address specific risks.
- Agree on Project Coordinator's tolerances in the AWP and quarterly plans when required.
- Conduct regular meetings to review the Project Quarterly Progress Report and provide direction and recommendations to ensure that the agreed deliverables are produced satisfactorily according to plans.
- Review Combined Delivery Reports prior to certification by the Implementing Partner.
- Appraise the Project Annual Review Report, make recommendations for the next AWP, and inform the Outcome Board about the results of the review.
- Review and approve end project report, make recommendations for follow-on actions.
- Provide *ad-hoc* direction and advice for exception situations when project Coordinator's tolerances are exceeded.
- Assess and decide on project changes through revisions.

Closing a project

- Assure that all Project deliverables have been produced satisfactorily.
- Review and approve the Final Project Review Report, including lessons-learned.
- Make recommendations for follow-on actions to be submitted to the Outcome Board.
- Commission project evaluation (only when required by partnership agreement)
- Notify operational completion of the project to the Outcome Board.

130. *Executive*

The **Executive** – AEDD – is ultimately responsible for the project, supported by the Senior Beneficiary and Senior Supplier. The Executive's role is to ensure that the project is focused throughout its life cycle on achieving its objectives and delivering outputs that will contribute to higher level outcomes. The Executive has to ensure that the project gives value for money, ensuring a cost-conscious approach to the project, balancing the demands of beneficiary and supplier. The specific responsibilities (as part of the above responsibilities for the NSC) are:

- Ensure that there is a coherent project organisation structure and logical set of plans
- Set tolerances in the AWP and other plans as required for the Project Coordinator.
- Monitor and control the progress of the project at a strategic level.
- Ensure that risks are being tracked and mitigated as effectively as possible.
- Brief Outcome Board and relevant stakeholders about project progress.
- Organise and chair NSC meetings.

102. The Executive is responsible for overall assurance of the project as described under the section entitled "Project assurance". If the project warrants it, the Executive may delegate some responsibility for the project assurance functions.

103. *Senior Beneficiary*

The **Senior Beneficiary** is responsible for validating the needs and for monitoring that the solution will meet those needs within the constraints of the project. The role represents the interests of all those who will benefit from the project, or those for whom the deliverables resulting from activities will achieve specific output targets. The Senior Beneficiary role monitors progress against targets and quality criteria. This role may require more than one person to cover all the beneficiary interests. For the sake of effectiveness the role should not be split between too many people. The specific responsibilities of the Senior Beneficiary are (as part of the above responsibilities for the NSC):

- Ensure the expected output(s) and related activities of the project are well defined.

- Make sure that progress towards the outputs required by the beneficiaries remains consistent from the beneficiary perspective.
- Promote and maintain focus on the expected project output(s).
- Prioritise and contribute beneficiaries' opinions on NSC decisions on whether to implement recommendations on proposed changes.
- Resolve priority conflicts.

104. The assurance responsibilities of the Senior Beneficiary are to check that:
- Specification of the Beneficiary's needs is accurate, complete and unambiguous.
- Implementation of activities at all stages is monitored to ensure that they will meet the beneficiary's needs and are progressing towards that target.
- Impact of potential changes is evaluated from the beneficiary point of view.
- Risks to the beneficiaries are frequently monitored.

105. Where the project's size, complexity or importance warrants it, the Senior Beneficiary may delegate the responsibility and authority for some of the assurance responsibilities (see the section entitled "Project assurance")

106. *Senior Supplier*

The **Senior Supplier** represents the interests of the parties which provide funding and/or technical expertise to the project (designing, developing, facilitating, procuring, implementing). The Senior Supplier's primary function within the NSC is to provide guidance regarding the technical feasibility of the project. The Senior Supplier role must have the authority to commit or acquire supplier resources required. If necessary, more than one person may be required for this role. Typically, the implementing partner, UNDP and/or donor(s) would be represented under this role. The specific responsibilities of the Senior Supplier are (as part of the above responsibilities for the NSC):
- Make sure that progress towards the outputs remains consistent from the supplier perspective.
- Promote and maintain focus on the expected project output(s) from the point of view of supplier management.
- Ensure that the supplier resources required for the project are made available.
- Contribute supplier opinions on NSC decisions on whether to implement recommendations on proposed changes.
- Arbitrate on, and ensure resolution of, any supplier priority or resource conflicts.

107. The Senior Supplier assurance role responsibilities are to:
- Advise on the selection of strategy, design and methods to carry out project activities.
- Ensure that any standards defined for the project are met and used to good effect.
- Monitor potential changes and their impact on the quality of deliverables from a supplier perspective.
- Monitor any risks in the implementation aspects of the project.

108. If warranted, some of this assurance responsibility may be delegated (see the section entitled "Project assurance").

Project Coordinator

109. **Overall responsibilities:** The Project Coordinator has the authority to run the project on a daily basis on behalf of the NSC within the constraints laid down by the committee. The Project Coordinator is responsible for daily management and decision-making for the project. The Project Coordinator's prime responsibility is to ensure that the project produces the results specified in the project document, to the required standard of quality and within the specified constraints of time and cost.

110. The Implementing Partner, the AEDD, appoints the Project Manager, who should be different from the Implementing Partner's representative in the Outcome Board. Prior to the approval of the project, the Project Developer role is the UNDP staff member responsible for project management functions during formulation until the Project Coordinator from the Implementing Partner is in place. The s**pecific responsibilities** would include:

Overall project management:

- Manage the realization of project outputs through activities.
- Provide direction and guidance to project team(s)/ responsible party/ies.
- Liaise with the NSC or its appointed Project Assurance roles to assure the overall direction and integrity of the project.
- Identify and obtain any support and advice required for the management, planning and control of the project.
- Responsible for project administration.
- Liaise with any suppliers.
- May also perform Team Manager and Project Support roles.

Running a project

- Plan the activities of the project and monitor progress against the initial quality criteria.
- Mobilize goods and services to initiative activities, including drafting TORs and work specifications.
- Monitor events as determined in the Monitoring & Communication Plan, and update the plan as required.
- Manage requests for the provision of financial resources by UNDP, using advance of funds, direct payments, or reimbursement using the FACE (Fund Authorization and Certificate of Expenditures).
- Monitor financial resources and accounting to ensure accuracy and reliability of financial reports.
- Manage and monitor the project risks as initially identified in the Project Brief appraised by the PAC, submit new risks to the NSC for consideration and decision on possible actions if required; update the status of these risks by maintaining the Project Risks Log.
- Be responsible for managing issues and requests for change by maintaining an Issues Log.
- Prepare the Project Quarterly Progress Report (progress against planned activities, update on Risks and Issues, expenditures) and submit the report to the NSC and Project Assurance.
- Prepare the Annual review Report, and submit the report to the NSC and the Outcome Board.
- Based on the review, prepare the AWP for the following year, as well as Quarterly Plans if required.

Closing a Project

- Prepare Final Project Review Reports to be submitted to the NSC and the Outcome Board.
- Identify follow-on actions and submit them for consideration to the NSC.
- Manage the transfer of project deliverables, documents, files, equipment and materials to national beneficiaries.
- Prepare final CDR/FACE for signature by UNDP and the Implementing Partner.

111. The Project Coordinator's function will end when the final project TE report, and other documentation required by the GEF and UNDP, have been completed and submitted to UNDP (including operational closure of the project).

Project Assurance

112. **Overall responsibility**: Project Assurance is the responsibility of each NSC member, however the role can be delegated. The Project Assurance role supports the NSC by carrying out objective and independent project oversight and monitoring functions. This role ensures appropriate project management milestones are managed and completed.

113. Project Assurance has to be independent of the Project Coordinator; therefore the NSC cannot delegate any of its assurance responsibilities to the Project Coordinator. A UNDP Programme Officer typically holds the Project Assurance role.

114. The implementation of the assurance responsibilities needs to answer the question “What is to be assured?”. The following list includes the key suggested aspects that need to be checked by the Project Assurance throughout the project as part of ensuring that it remains relevant, follows the approved plans and continues to meet the planned targets with quality.

- Maintenance of thorough liaison throughout the project between the members of the NSC.
- Beneficiary needs and expectations are being met or managed.
- Risks are being controlled.
- Adherence to the Project Justification (Business Case).
- Projects fit with the overall Country Programme.
- The right people are being involved.
- An acceptable solution is being developed.
- The project remains viable.
- The scope of the project is not “creeping upwards” unnoticed.
- Internal and external communications are working.
- Applicable UNDP rules and regulations are being observed.
- Any legislative constraints are being observed.
- Adherence to RMG monitoring and reporting requirements and standards.
- Quality management procedures are properly followed.
- NSC’s decisions are followed and revisions are managed in line with the required procedures.

115. Specific responsibilities would include:

- Initiating a project.
- Ensure that project outputs definitions and activity definition including description and quality criteria have been properly recorded in the Atlas Project Management module to facilitate monitoring and reporting.
- Ensure that people concerned are fully informed about the project.
- Ensure that all preparatory activities, including training for project staff, logistic supports are timely carried out.

Running a project

- Ensure that funds are made available to the project.
- Ensure that risks and issues are properly managed, and that the logs in Atlas are regularly updated.
- Ensure that critical project information is monitored and updated in Atlas, using the Activity Quality log in particular.
- Ensure that Project Quarterly Progress Reports are prepared and submitted on time, and according to standards in terms of format and content quality.
- Ensure that CDRs and FACE are prepared and submitted to the NSC and Outcome Board.
- Perform oversight activities, such as periodic monitoring visits and “spot checks”.
- Ensure that the Project Data Quality Dashboard remains “green”.

Closing a project

- Ensure that the project is operationally closed in Atlas.
- Ensure that all financial transactions are in Atlas based on final accounting of expenditures.
- Ensure that project accounts are closed and status set in Atlas accordingly.

Project Support

116. **Overall responsibilities:** The **Project Support** role provides project administration, management and technical support to the Project Coordinator as required by the needs of the individual project or Project Coordinator. The provision of any Project Support on a formal basis is optional. It is necessary to keep Project Support and Project Assurance roles separate in order to maintain the independence of Project Assurance.

Specific responsibilities: Some specific tasks of the Project Support would include:

Provision of administrative services:

- Set up and maintain project files.
- Collect project related information data.
- Update plans.
- Administer the quality review process.
- Administer NSC meetings.

Project documentation management:

- Administer project revision control.
- Establish document control procedures.
- Compile, copy and distribute all project reports.

Financial Management, Monitoring and reporting

- Assist in the financial management tasks under the responsibility of the Project Manager.
- Provide support in the use of Atlas for monitoring and reporting.

Provision of technical support services

- Provide technical advices.
- Review technical reports.
- Monitor technical activities carried out by responsible parties.

117. Agreement on intellectual property rights and use of logo on the project's deliverables**:** In order to accord proper acknowledgement to the GEF for providing funding, the GEF logo will appear together with the UNDP logo on all promotional materials, other written materials like publications developed by the project, and project hardware. Any citation on publications regarding projects funded by the GEF will also accord proper acknowledgement to the GEF.

A.7 *Benefits.* Describe the socioeconomic benefits to be delivered by the project at the national and local levels. How do these benefits translate in supporting the achievement of global environment benefits (GEF Trust Fund) or adaptation benefits (LDCF/SCCF)?

118. National benefits: At the national level, the adaptation benefits generated by the LDCF-financed project will include building the overall capacity of the GoM to plan for and respond to floods. This will be achieved through training and capacity-building of government officials within Mali-Météo, DNH and DGPC at the national, district and commune levels. Targeted beneficiaries of the project's capacity-building activities will, at a minimum, include: i) 50 national-level representatives; ii) 50 district-level representatives (in each of three targeted districts); and iii) 100 commune-level representatives (in each of the seven targeted communes).

119. These stakeholders will benefit directly from capacity-building activities to improve the planning, design and implementation of GoM's activities to respond to climate-related hazards, particularly floods. In addition, the benefits of the LDCF-financed project will include: i) an increase in the total geospatial coverage of the national hydrological and meteorological monitoring (hydromet) network by at least 10%; and ii) the development of an enhanced EWS for monitoring and issuing flood warnings to vulnerable communities in

Bamako, Kayes and Mopti. The total size of the population to be reached by the proposed EWS – designed specifically for floods – will include at least 20% of the population.

120. Local benefits: At the local level, the LDCF-financed project activities will deliver targeted adaptation benefits to 51 vulnerable local communities in the districts of Bamako, Kayes and Mopti, resulting in direct benefits for at least 1,200,000 people which amounts to 120,000 households. Within these target intervention sites, the project will introduce multiple measures to reduce vulnerability to flood risks, including both measures to increase resilience as well as decrease exposure to floods. Vulnerable local communities will benefit directly from the establishment of physical measures for flood protection including *inter alia* permeable rock dams and stormwater drains for water evacuation at priority flood-prone areas. In addition to providing physical flood protection, the project will implement awareness-raising activities on the management of floods to at least 500,000 people within communes I, IV and VI in Bamako, as well as Tomora in Kayes. The project's awareness-raising activities will also include campaigns to increase the knowledge of municipal and village officials on the management of public risks related to floods.

121. At the local level, the vulnerability of project beneficiaries to floods will be reduced through several measures including *inter alia*: i) dissemination of early warnings; ii) long-term resilience to floods as a result of the mainstreaming of flood risks in governing document such as the PDESC; and iii) improved capacity of stormwater drainage systems, through maintenance and extension of existing drainage systems in communes I, IV and VI of Bamako (please see Section III for the list of the activities selected to be implemented per site under the LDCF-financed project).

122. Municipal and village authorities in the seven communes that have been selected for LDCF-financed interventions will benefit from capacity-building activities. As a result, the communes' institutional, technical and financial capacity to develop and implement site-specific adaptation interventions will be strengthened. This will improve the management of flood risks and hazards thereby decreasing the vulnerability of local communities to these disasters. To promote a gender-sensitive approach in the development of the LDCF-financed project, representatives of CAFO[56] – an association of women's NGO groups in Mali – participated in several of the regional and local workshops in Bamako, Kayes and Mopti. The participation of CAFO ensures that a gender-sensitive approach recognising that floods affect men and women differently has been considered in the design of the LDCF-financed project. This project will also consider the effect of floods on other vulnerable groups such as children and the elderly. In so doing, the project will increase the adaptive capacity of the most vulnerable groups of Mali's society to floods.

A.8 *Knowledge Management*. Elaborate on the knowledge management approach for the project, including, if any, plans for the project to learn from other relevant projects and initiatives (e.g. participate in trainings, conferences, stakeholder exchanges, virtual networks, project twinning) and plans for the project to assess and document in a user-friendly form (e.g. lessons learned briefs, engaging websites, guidebooks based on experience) and share these experiences and expertise (e.g. participate in community of practices, organize seminars, trainings and conferences) with relevant stakeholders.

123. Knowledge Management: Through the LDCF-finanaced project, appropriate climate change adaptation interventions will be implemented in 51 vulnerable local communities in Bamako, Kayes an Mopti. Therefore, knowledge will be generated collectively with the 51 selected local communities, CBOs and NGOs as well as government institutions – national and local – in the Bamako, Kayes and Mopti. The LDCF-financed project will also strengthen the technical, institutional and financial capacity of national and local government instititutions, thereby contributing to alleviating the shortage of extension personnel. In addition, the project will improve knowledge management among targeted institutions and local communities by:

- Developing a detailed flood risks and hazards communication strategy – through a participatory approach – to be implemented in the vulnerable local communities after the installation of EWSs;

[56] CAFO stands for Coordination of Associations and Women's Organisations.

- Developing short- to medium-term flood risk maps which are composites of socio-economic information including *inter alia* population size and density, settlement patterns, land uses and value, sources of livelihoods and infrastructure – and flood-vulnerable assets ;
- Implementing an education programme in the school curriculum and raising awareness on the prevention of flood risks to decrease the vulnerability of school children;
- Developing commune-specific FRRPs in a participatory manner with local communities;
- Compiling awareness-raising materials on flood risks, climate change adaptation and appropriate solid waste disposal practices;
- Developing policy briefs to detail the proposed revisions to the existing building and settlement codes for the intervention sites.
- Compiling training material for the relevant national and local government officials within the targeted communes on climate risk management, preventing and minimising the negative effects of floods, on vulnerable on local communities.
- Developing long-term maintenance plans – in a participatory manner – and simple technical guidelines, where necessary, to support the long-term maintenance of the LDCF-financed soft and hard interventions.

124. The LDCF project management team is encouraged to engage with the supporting staff of the following GEF and non-GEF ongoing country interventions to exchange knowledge and lessons learned :

- LDCF-financed project entitled "**Strengthening the resilience of women's producer groups and vulnerable communities in Mali**" is currently executed by UNDP in the districts of Sikasso, Kayes and Koulikoro. The objective of the project is to build the resilience of women subsistence farmers to the negative effects of climate change by improving access to water, promoting climate-smart agriculture, and diversifying their income. The project activities include *inter alia*: i) increasing the knowledge of women's subsistence farming groups on adaptation options; ii) restoring communal forests; iii) demonstrating land and water conservation techniques; and iv) developing and increasing access to agro-meteorological information. The implementation period is 2015–2019 with a budget of US$ 5,460,000. Lessons learned on best-practice adaptation options in the Malian context will inform the awareness-raising campaigns for the public and the training to be provided to government officials on reducing and managing the impacts of floods.

- Additionally to the aforementioned LDCF-financed project, UNDP is one of the executing partners of the project entitled "**Programme for the support of the National Adaptation Strategy to Climate Change in Mali**", financed by Government of Germany and commissioned by the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB). The project has a budget of US$ 5,500,000 for the period 2014–2019. The objective of the project is to increase the resilience of vulnerable communities to climate change using an integrated approach to adaptation including ecosystem restoration and strengthening of production chains for ecosystem-based resources. Activities financed by the project include *inter alia*: i) the mainstreaming of climate change considerations into existing policies as well as planning and monitoring instruments; and ii) the identification of best-practice interventions to effectively manage the negative effects of climate change on local communities in collaboration with municipal authorities. In addition, the project activities include the expansion of the network of weather stations. The LDCF-financed project will build on the work undertaken by the project described above by increasing the network of weather stations to improve the quality and quantity of weather-related information in the country. The lessons learned in the mainstreaming of climate change considerations into existing policies will inform the activities under Component 2 of the LDCF-financed project.

- The project entitled "**Programme support for climate change adaptation in the vulnerable regions of Mopti and Timbuktu**" is financed by the Adaptation Fund – to the value of ~$8,500,000 – and implemented by UNDP over the period 2016–2018. The main objective of the project is to increase the resilience of vulnerable communities in Mopti and Timbuktu, and their adaptive capacity to climate

change. In particular, Component 3 seeks to strengthen the capacity of local government institutions and communities on adaptation options. The knowledge gathered on the effectiveness of adaptation options implemented in the project described above will be shared with the LDCF project team and presented to government officials to increase their knowledge on climate change and adaptation options. The lessons learned in the awareness-raising campaigns undertaken in 20 local communities in Mopti and Timbuktu will inform the campaigns to be undertaken within the LDCF-financed project.

- The project entitled "**Enhancing adaptive capacity and resilience to climate change in Mali's agriculture sector**" is financed by LDCF and Canada UNDP Climate Change Adaptation Facility. It is implemented by the National Directorate of Agriculture (DNA) and UNDP with a budget of $ 2,340,000 over the period 2010-2014. However, the project is still under implementation. The objective of the project is to enhance the adaptive capacities of vulnerable rural populations to the additional risks posed by climate change on agricultural production and food security in the country. The project targets several municipalities in the districts of Kayes, Koulikoro, Sikasso, Ségou, Mopti and Gao to increase their technical and financial capacity to manage the impacts of climate change on agricultural production and food security. Output 1.3 of the project described above pertains to developing adaptation financing strategies which will inform those to be developed under Output 2.3 of the LDCF-financed project. This exchange of lessons learned with the LDCF-financed project will be valuable in developing effective financial strategies that allow funds to be readily available and accessible by local government authorities to reduce and manage floods impacts in the country.

- In 2007, the GoM established a fund entitled "**National support fund to local authorities**" which is managed by the ANICT. The establishment of this fund followed the decision to undertake decentralised governance in Mali in 1992. The fund supports the transfer of technical, institutional and financial capacities from the national government to decentralised authorities such as municipalities. It is used to: i) strengthen the capacities of regional, communal and local government authorities to promote socio-economic development in their respective area of jurisdiction; and ii) promote the development of the environment, education, water and health sectors at the regional, communal, and municipal and village scales. The technical and financial capacity of local government authorities will be further strengthened by the LDCF-financed project.

B. DESCRIPTION OF THE CONSISTENCY OF THE PROJECT WITH:

B.1 *Consistency with National Priorities.* Describe the consistency of the project with national strategies and plans or reports and assessements under relevant conventions such as NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, etc.:

125. The LDCF-financed project has been designed to respond to Mali's national priorities and will support the implementation of national policies, plans and strategies. In addition to the national priorities as detailed in policies, plans and strategies, the project's activities are well-aligned with the GEF-LDCF and UNDP strategic objectives.

Policy conformity

126. The management of climate risks and floods in particular is addressed in Axis 2 of the **Poverty Reduction and Growth Strategy Paper** (CSCRP, 2012-2017). This axis, entitled "Strengthening long-term basis for development and equitable access to quality social services", aims to develop human resources while simultaneously addressing gender inequalities, access to basic social services and the preservation of the environment in the context of climate change.

127. The **National Plan for Multi Risk Preparation and Emergency Disaster Response** (PNMRRC) was developed to increase the speed of responses in the event of natural disaster events, including the release of emergency funding. The main objectives of the plan are to: i) facilitate the coordination of disaster prevention

and management actions and enable the coherence of sectoral plans; ii) clarify the relationships/responsibilities between participating government agencies and humanitarian partners; iii) identify and address the most probable risks of natural disasters; iv) integrate protocols for disaster/emergency response measures into sectoral plans and development programmes; and v) reduce the time taken to respond to crises. In line with the ongoing activities of the PNMRRC, the LDCF-financed project will generate recommendations for policy reforms to manage settlements in flood-prone areas thereby reducing exposure to flood risks. Policy reforms will pertain to existing building, and settlement codes and the associated land-use plans which will inform future development planning. Managing settlements will consist of developing and implementing the necessary interventions – including both soft and hard – to reduce flood risks in flood-prone areas. In addition, the project will develop innovative financial strategies to increase the availability and speed of the release of funds to support relief efforts in the event of climate-related hazards such as floods.

128. Although the **National Adaptation Programme of Action** (NAPA) recognises floods as the third most important climatic risk – after droughts and strong winds – in the country, there are no NAPA priority developed to specifically address floods. However, the LDCF-financed project supports the implementation of some priorities in Mali's NAPA that can contribute to flood management. LDCF financed will be used to contribute to NAPA priorities 12 and 16. NAPA priority 12 is entitled "Awareness and organisation of populations to preserve local natural resources through the development of local conventions and regulations". The project will support the preservation and restoration of riparian areas of wetlands to increase groundwater infiltration and reduce soil erosion, which would in turn reduce flood risks. This will be achieved through the rehabilitation of riparian areas of wetlands in the intervention sites. NAPA priority 16 is entitled "Communication with the people on the effects of climate change through the adoption of positive behaviours for adaptation." In line with this NAPA priority, the project will raise public awareness on the proposed EWS and the appropriate solid waste disposal practices. Educational tools will also be developed for schools to build a culture of safety in Mali and decrease the vulnerability of children to floods.

LDCF conformity

129. This project is consistent with the strategic objectives of the LDCF, which are to: i) reduce vulnerability to the adverse effects of climate change; ii) increase the adaptive capacity to respond to the effects of climate change; and iii) promote the transfer and adoption of adaptation technologies. This project is in alignment with these LDCF objectives in that it will: i) increase the capacity of the GoM and local government authorities to effectively plan and implement DRM activities to decrease the vulnerability of communities that are at risk of climate-related hazards and natural disasters such as floods; ii) undertake a policy reform to support the integration of the predicted effects of climate change into existing development and planning policies, plans and strategies; and iii) implement on-the-ground flood protection measures including *inter alia* dykes, levees and floodwalls in pilot sites within Bamako, Kayes and Mopti.

Alignment with the objectives of UNDP

130. The LDCF-financed project's activities support the implementation of Outcome 3 of UNDP's Strategic Plan, which is "Resilience-building by facilitating the integration of disaster risk reduction with adaptation to climate change and addressing differentiated social and economic impacts; and preparedness for disaster management and recovery at the sub-national and national levels". This project will also support the Common Framework in Support to the Transition (CCAT) that was developed to strengthen UN operational activities in Mali following political instability in 2012.

C. DESCRIBE THE BUDGETED M &E PLAN:

131. The project results as outlined in the project results framework will be monitored annually and evaluated periodically during project implementation to ensure the project effectively achieves these results.

132. Project-level monitoring and evaluation will be undertaken in compliance with standard UNDP requirements as outlined in the UNDP POPP and UNDP Evaluation Policy. Though these UNDP requirements are not detailed in this section of the project document, the UNDP Country Office will ensure UNDP M&E requirements are met in a timely fashion and to high quality standards. The additional and mandatory GEF-specific M&E requirements as outlined in this section will be undertaken in accordance with the GEF M&E policy and GEF guidance materials. In addition to these mandatory UNDP and GEF M&E requirements, other M&E activities deemed necessary to support project-level adaptive management, and the exact role of project target groups and other stakeholders in project M&E activities, will be finalised during the Inception Workshop and will be detailed in the Inception Report.

Oversight and monitoring responsibilities:

133. The primary responsibility for daily project implementation and regular monitoring rests with the Project Coordinator. The Project Coordinator will develop annual work plans based on the multi-year work plan included in Appendix 9, including annual targets at the output level to ensure the efficient implementation of the project. The Project Coordinator will ensure that the standard UNDP and GEF M&E requirements are fulfilled to the highest quality. This includes, but is not limited to, ensuring the results framework indicators are monitored annually in time for reporting (i.e. GEF PIR), and reporting to the NSC at least twice a year on project progress. The Project Coordinator will inform the NSC and the UNDP Country Office of any delays or difficulties as they arise during implementation, including the implementation of the M&E plan, so that the appropriate support and corrective measures can be adopted. The Project Coordinator will also ensure that all project staff maintain a high level of transparency, responsibility and accountability in monitoring and reporting project results.

134. The UNDP Country Office will support the Project Coordinator as needed, including through annual supervision missions. The UNDP Country Office is responsible for complying with all UNDP project-level M&E requirements as outlined in the UNDP POPP. This includes ensuring the UNDP Quality Assurance Assessment during implementation is undertaken annually; that annual targets at the output level are developed, and monitored and reported using UNDP corporate systems; and, updating the UNDP gender marker on an annual basis based on progress reported in the GEF PIR and UNDP ROAR reporting. Any quality concerns flagged by the process must be addressed by project management. Additional M&E and implementation quality assurance and troubleshooting support will be provided by the UNDP-GEF Regional Technical Advisor and the UNDP-GEF Unit as needed. The project target groups and stakeholders including the GEF Operational Focal Point will be involved as much as possible in project-level M&E.

135. **Audit Clause**: The project will be audited according to UNDP Financial Regulations and Rules and applicable audit policies.

136. **Additional GEF monitoring and reporting requirements:**

Inception Workshop and Report: A project inception workshop will be held after the project document has been signed by all relevant parties to: i) re-orient project stakeholders to the project strategy and discuss any changes in the overall context that influence project implementation; ii) discuss the roles and responsibilities of the project team, including reporting and communication lines and conflict resolution mechanisms; iii) review the results framework and discuss reporting, monitoring and evaluation roles and responsibilities and finalise the M&E plan; iv) review financial reporting procedures and mandatory requirements, and agree on the arrangements for the annual audit; v) plan and schedule NSC meetings and finalise the first year annual work plan. The Project Coordinator will prepare the inception report no later than two weeks after the inception workshop. The final inception report will be cleared by the UNDP Country Office and the UNDP-GEF Regional Technical Adviser, and will be approved by the NSC.

137. GEF Project Implementation Report (PIR): The Project Coordinator, the UNDP Country Office, and the UNDP-GEF Regional Technical Advisor will provide objective input to the annual GEF PIR covering the reporting period July (previous year) to June (current year) for each year of project implementation. The

Project Coordinator will ensure that the indicators included in the project results framework are monitored annually well in advance of the PIR submission deadline and are reported on accordingly in the PIR. The PIR that is submitted to the GEF each year must also be submitted in English and shared with the NSC. The UNDP Country Office will coordinate the input of the GEF Operational Focal Point and other stakeholders to the PIR. The quality rating of the previous year's PIR will be used to inform the preparation of the subsequent PIR. The project's terminal PIR along with the terminal evaluation (TE) report and corresponding management response will serve as the final project report package. The final project report package shall be discussed with the NSC during an end-of-project review meeting to discuss lesson learned and opportunities for scaling up.

138. GEF Focal Area Tracking Tools: In line with its objective and the corresponding GEF Focal Areas/ Programs, this project will prepare the following GEF Tracking Tool(s): 2,6,8,10,13*, as agreed with the UNDP-GEF RTA.* The baseline/CEO Endorsement GEF Focal Area Tracking Tool(s) – submitted in Appendix 10 – will be updated by the Project Coordinator /Team and shared with *the mid-term review consultants* and terminal evaluation consultants before the required *review/*evaluation missions take place. The updated GEF Tracking Tool(s) will be submitted to the GEF along with the completed *Mid-term Review report* and Terminal Evaluation report.

139. Mid-term Review (MTR): An independent mid-term review process will begin after the second PIR has been submitted to the GEF, and the final MTR report will be submitted to the GEF in the same year as the 3rd PIR. The MTR findings and responses outlined in the management response will be incorporated as recommendations for enhanced implementation during the final half of the project's duration. The terms of reference, the review process and the final MTR report will follow the standard templates and guidance available on the UNDP Evaluation Resource Center (ERC). Additional quality assurance support is available from the UNDP-GEF Directorate. The final MTR report will be available in English and will be cleared by the UNDP Country Office and the UNDP-GEF Regional Technical Adviser, and approved by the NSC.

140. Terminal Evaluation (TE): An independent TE will take place before operational closure of the project. The Project Coordinator will remain on contract until the TE report and management response have been finalised. The terms of reference, the evaluation process and the final TE report will follow the standard templates and guidance available on the UNDP Evaluation Resource Center. Additional quality assurance support is available from the UNDP-GEF Directorate. The final TE report will be cleared by the UNDP Country Office and the UNDP-GEF Regional Technical Adviser, and will be approved by the NSC. The TE report will be publically available in English on the UNDP ERC.

141. The UNDP Country Office will include the planned project TE in the UNDP Country Office evaluation plan, and will upload the final TE report in English and the corresponding management response to the UNDP ERC. Once uploaded to the ERC, the UNDP Independent Evaluation Office will undertake a quality assessment and validate the findings and ratings in the TE report, and rate the quality of the TE report. The UNDP IEO assessment report will be sent to the GEF Independent Evaluation Office along with the project TE report.

142. The UNDP Country Office will retain all M&E records for this project for up to seven years after project financial closure in order to support ex-post evaluations undertaken by the UNDP Independent Evaluation Office and/or the GEF Independent Evaluation Office.

Table 3: GEF M&E budget.

GEF M&E requirements	Primary responsibility	Indicative costs to be charged to the Project Budget[57] (US$)	Time frame

[57] Excluding project team staff time and UNDP staff time and travel expenses.

		GEF grant	Co-financing	
Inception Workshop	UNDP Country Office	USD 3,000	*UNDP*	Within two months of project document signature
Inception Report	Project Manager	None	None	Within two weeks of inception workshop
Standard UNDP monitoring and reporting requirements as outlined in the UNDP POPP	UNDP Country Office	None	None	Quarterly, annually
Monitoring of indicators in project results framework	Project Manager	Per year: USD 4,000	*UNDP*	Annually
GEF Project Implementation Report (PIR)	Project Manager and UNDP Country Office and UNDP-GEF team	None	None	Annually
NEX Audit as per UNDP audit policies	UNDP Country Office	Per year: USD 3,000	*UNDP*	Annually or other frequency as per UNDP Audit policies
Supervision missions	UNDP Country Office	None[58]	*UNDP*	Annually
Oversight missions	UNDP-GEF team	None58	*UNDP*	Troubleshooting as needed
GEF Secretariat learning missions/site visits	Project Manager and UNDP-GEF team	None	*UNDP*	To be determined.
Mid-term GEF Tracking Tool to be updated by project M&E specialist	*Project Manager*	*USD 10,000*	*UNDP*	*Before mid-term review mission takes place.*
Independent Mid-term Review (MTR)	*UNDP Country Office and Project team and UNDP-GEF team*	*USD 35,000*	*UNDP*	*Between 2nd and 3rd PIR.*
Final GEF Tracking Tool to be updated by project M&E specialist	Project Manager	USD 10,000	*UNDP*	Before terminal evaluation mission takes place
Independent Terminal Evaluation (TE) included in UNDP evaluation plan	UNDP Country Office and Project team and UNDP-GEF team	USD 35,000	*UNDP*	At least three months before operational closure
Translation of MTR and TE reports into English	*UNDP Country Office*	*USD 10,000*	*UNDP*	*As required. GEF will only accept reports in English.*
TOTAL indicative COST Excluding project team staff time, and UNDP staff and travel expenses		*USD 138,000*		

[58] The costs of UNDP Country Office and UNDP-GEF's participation and time are charged to the GEF Agency Fee.

PART III: CERTIFICATION BY GEF PARTNER AGENCY(IES)

A. GEF Agency(ies) certification

This request has been prepared in accordance with GEF policies[59] and procedures and meets the GEF criteria for CEO endorsement under GEF-6.

Agency Coordinator, Agency Name	Signature	Date (MM/dd/yyyy)	Project Contact Person	Telephone	Email Address
Adriana Dinu Executive Coordinator UNDP-GEF		21 March 2016	Ms Mame Diop RTA, CCA	+25191939 6499	mame.diop@undp.org

[59] GEF policies encompass all managed trust funds, namely: GEFTF, LDCF, and SCCF

ANNEX A: PROJECT RESULTS FRAMEWORK (either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).

Intended Outcome as stated in the UNDAF/Country Programme Results and Resources Framework: ***Outcome 2****: Disadvantaged groups, particularly women and young people, benefit from increased capacities and productive opportunities in a healthy and sustainable environment conducive to poverty reduction.*						
Outcome indicators as stated in the Country Programme Results and Resources Framework, including baseline and targets: ***Output 2, Indicator 2:*** *Percentage of vulnerable people pursuing disaster risk and climate-resilient economic activities.* ***Output 3, Indicator 2:*** *Number of disaster risk reduction and sanitation action plans developed at national, regional and local level.*						
Applicable Outputs from the 2014 – 2017 UNDP Strategic Plan: *choose one!* Output 1.4: Scaled up action on climate change adaptation and mitigation cross sectors which is funded and implemented.						
Applicable Output Indicators from the UNDP Strategic Plan Integrated Results and Resources Framework: Output 1.4 indicator 1.4.1: a) Extent to which climate finance is being accessed b) Extent to which there is a system in place to access, deliver, monitor, report on and verify climate finance. Output 1.4 indicator 1.4.2: Extent to which implementation of comprehensive measures – plans, strategies, policies, programmes and budgets – to achieve low-emission and climate-resilient development objectives has improved.						
	Objective and Outcome Indicators	**Baseline[60]**	**Mid-term Target**60	**End of Project Target**60	**Source of verification**	**Assumptions[61]**
Project Objective: **To strengthen the capacity of national and local government authorities to effectively manage the negative effects of floods on local communities and infrastructure in Mali.**	Technical and institutional capacity of municipal and village authorities, Mali-Météo, DNH and DGPC to effectively manage flood risks [adapted from AMAT Indicator 10].	Currently, there is low capacity within national and local government authorities to assess flood risks as well as develop and implement flood risk reduction interventions. Scorecard rating at baseline is estimated at 2.	LDCF-financed interventions are implemented to increase the technical and institutional capacity of municipal and village authorities, Mali-Météo, DNH and DGPC to plan and manage flood risks is increased. Scorecard rating of at least	By the end of the project, municipal and village authorities, Mali-Météo, DNH and DGPC have the technical and institutional capacity to assess flood risks as well as implement risk management and reduction interventions to decrease the vulnerability of local communities at the intervention sites. Scorecard rating of	Capacity scorecard assessment of the technical officials within municipal and village authorities, Mali-Météo, DNH and DGPC. The following criteria will be used: 1. Ability to analyse data from weather stations and disseminate flood early warnings to vulnerable communities timely. 2. Capacity to assess flood risks under the predicted conditions of climate change (given the necessary tools such as the flood risk maps). 3. Capacity to develop and effectively implement flood risk management and reduction interventions to decrease the	Risk: Insufficient political and financial support from the GoM. Assumption: The GoM has the financial capacity to support the maintenance of the project interventions. Risk: Limited coordination among government authorities. Assumption: Adequate involvement of and coordination between government authorities will enable the maintenance of a good progress rate for the project implementation and promote sustainability.

[60] Baseline, mid-term and end of project levels must be expressed in the same neutral unit of analysis as the corresponding indicator.
[61] Risks must be outlined in the Feasibility section of this project document.

			3.	at least 4.	vulnerability of local communities in the intervention sites. The scorecard rating is as follows: 1 = No capacity or very limited capacity at the individual level and within the respective government institution. 2 = Partially developed capacity at the individual level. 3 = Partially developed capacity at the individual level and within the respective government institution. 4 = Fully developed and demonstrated capacity at the individual level. 5 = Fully developed and demonstrated capacity at the individual level and within the respective government institution.	
Component 1/ Outcome 1: Strengthened technical capacity of municipal and village authorities to improve flood early warning systems and dissemination of climate-related risk information.	Number of people (% of whom are women) with access to improved flood EWS [adapted from AMAT 8].	Currently, 0 people are covered by the existing EWS system. However, the system is not well developed for rapid-onset events such as floods.	By Mid-Term, at least 600,000 people have access to improved flood EWS in the intervention sites (50% of whom are women).	By the end of the project, 1,200,000 people have access to improved flood EWS (50% of whom are women).	Analysis of maps (at least one per commune) delineating the extent of the flood EWS and the population size covered.	Risk: Inadequate coordination between national and local (communal, municipal and village) authorities. Assumption: Coordination between national and local government will enable successful implementation of the project. Risk: Insufficient political and financial support from the GoM. Assumption: The GoM has the financial capacity to support the maintenance of the project interventions. Risk: Unclear distribution of the roles for the

						maintenance of meteorological and hydrological stations, pluviographs, network of canals to divert water, permeable rock dams, and stormwater drains. Assumption: The development and implementation of long-term maintenance plans will strengthen the technical and financial capacity of the relevant stakeholders to maintain the new equipment.
	Number of monitoring and management committees established (composed of at least 50% women).	There is currently no monitoring and management committee in place to act as an intermediary link between local communities and Mali-Météo for the effective dissemination of climate risk and hazard information.	At least five of the monitoring and management committees established and composed of 50% women.	At least seven monitoring and management committees established (1 per commune), composed of at least 50% women, for the effective dissemination of information on climate risk and hazard between Mali-Météo and the relevant communities.	Review of the official list of committee members which is to be included in the MoU with Mali-Météo.	Risk: Project interventions are not gender-sensitive. Assumption: The participation of women's groups in the design and implementation of the project promotes the distribution of benefits in a gender-sensitive manner.
Component 2/ Outcome 2: Effective flood risk management mainstreamed into the relevant development planning policies and budgetary processes to increase the	Number of Economic, Social and Cultural Development Programme (PDESC) revised to include short- to medium-term flood risks [adapted from AMAT 13].	There is currently one PDESC per district and they make little to no mention of flood risks and locally-appropriate reduction measures. At present, there are several incoherent building codes	At least one PDESC revised.	Three PDESC revised (one for each targeted district) to include short- to medium-term flood risks.	Review of the revised PDESC.	Risk: Limited coordination among government authorities. Assumption: Adequate involvement of and coordination between government authorities will enable the maintenance of a good progress rate for the project implementation and promote sustainability Risk: Inadequate

resilience of local communities.		that prescribe different minimum standards for flood-resilient infrastructure.				coordination between national and local (communal, municipal and village) authorities. Assumption: Coordination between national and local government will enable successful implementation of the project.
	Number of commune-specific Flood Risk Reduction Plans (FRRPs) developed in a participatory manner with local communities [adapted from AMAT 13].	There are currently no commune-specific FRRPs to provide a roadmap to decrease the vulnerability of local communities in the selected communes to floods.	At least two FRRPs developed.	At least seven FRRPs (one per selected commune) is developed in a participatory manner. The FRRPs will detail locally-appropriate and cost-effective flood risk reduction interventions to be implemented.	Review of the FRRPs produced.	*Risk:* Project interventions are not gender-sensitive. *Assumption:* The participation of women's groups in the design and implementation of the project promotes the distribution of benefits in a gender-sensitive manner.
Component 3/ Outcome 3: Climate-resilient flood risk management and reduction techniques transferred to local communities within the targeted communes to decrease their vulnerability.	Number of km of stormwater drains constructed and rehabilitated to decreased flood risks [adapted from AMAT 2].	Drains in communes I, IV, VI, Sébékoro and Fatoma and/or the inadequate maintenance of existing ones.	By Mid-Term, at least 10 km of stormwater drain is constructed.	Drains constructed in five of the selected communes and at least 20 km of existing stormwater drains within the selected communes cleaned and rehabilitated to improve water drainage.	Interviews with local communities. Measurement of the length of stormwater drains constructed and rehabilitated. Review of the maintenance systems in place. Review of construction and maintenance progress reports to be provided by the contracted company to the Project Management Unit.	Risk: Unclear distribution of the roles for the maintenance of meteorological and hydrological stations, pluviographs, network of canals to divert water, permeable rock dams, and stormwater drains. Assumption: The development and implementation of long-term maintenance plans will strengthen the technical and financial capacity of the relevant stakeholders to maintain the new equipment. Risk: Insufficient support from the beneficiary communities to implement the project successfully as benefits are not apparent

						immediately and only become evident in the event of floods. Assumption: Involvement in the design of project interventions and ongoing communication on the expected benefits of the activities for local communities will result in the support of the project by these communities. Risk: Project interventions are not gender-sensitive. Assumption: The participation of women's groups in the design and implementation of the project promotes the distribution of benefits in a gender-sensitive manner. Risk: Interventions in the district of Mopti are delayed by ongoing conflicts Assumption: There is no civil unrest in the intervention sites during the implementation of the project. Risk: Climate hazards delay the implementation of project interventions. Assumption: Scheduling of activities based on potential climate risks enables climate-induced delays in the implementation of project interventions to be prevented.
	Number of km of riparian areas revegetated with climate-resilient species.	Approximately 25 km of riparian areas are revegetated.	By Mid-Term, at least 20 km of riparian areas are revegetated with climate-	At least 35 km of riparian areas revegetated with climate-resilient species to increase	Site visits to verify the extent of riparian area revegetated. Review of progress reports on revegetation interventions. Interviews with the relevant	Risk: Insufficient support from the beneficiary communities to implement the project successfully as benefits are not apparent

			resilient species.	water infiltration and reduce soil erosion.	implementing organisations.	immediately and only become evident in the event of floods. Assumption: Involvement in the design of project interventions and ongoing communication on the expected benefits of the activities for local communities will result in the support of the project by these communities.

ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Respo
Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

Comments	Response
STAP Comments	
STAP recommends describing how different flood risk scenarios will be developed and suggests adding socioeconomic elements to these scenarios, particularly a range of possible future development plans that could increase or decrease the amount of infrastructure at risk and the magnitude and pattern of population vulnerability.	Under Output 1.3, the process of developing different flo scenarios is outlined. This process will include the follow Firstly, different flood risk scenarios will be developed a based on updated and downscaled climate models. There economic data based on indicators – including inter alia related indices, settlement patterns, land uses will be col analysed. Thirdly, the flood risk scenarios will be combi socio-economic data to develop a short to medium risk m this map, a flood risk index will be developed to facilitat DRM interventions. Finally, the socio-economic costs o short to medium term will be quantified based on risks, v of local communities and potential loss or damage to ass flood-prone areas and analyze the costs and benefits of a adaptation options for flood management. This will inclu analysis of the additional risks incurred by possible futu development.
The full proposal should describe the criteria for selecting the meteorological equipment to be purchased by the project, including the criteria for the number of devices. A summary of the assessment of the current situation would be helpful.	A summary assessment of the current situation has been under the baseline for component 1. Output 1.1 and 1.2 – under which the procurement mete equipment is conducted – are detailed in the full proposa The meteorological devices will be acquired as part of o based on the capacity gap of Mali's hydro-meteorologic network. Seven local communities have been identified from this equipment and a national meteorologist will be determine the appropriate type of meteorological and hy stations required to extend and strengthen Mali-Météo's Under output 1.2, the meteorological equipment will be through extensive consultation with local communities, and with the support of a flood EWS specialist. The sele build on the experience of a number of previous initiativ the LDCF Africa Climate Information and Early Warnin
STAP looks forward to further details on the how the risk mapping will be conducted, including the geographic scale, data sources, and engagement of local stakeholders	The risk mapping is detailed in the full proposal under C This risk analysis will cover the intervention sites in Ba and Mopti and will comprise three datasets, namely: i) f exposure of local communities within the intervention si short- to medium-term; ii) socio-economic information i *alia* population-related indices and sources of livelihood use information including *inter alia* the location of asset public infrastructure – e.g. buildings, roads and bridges settlements.
Additional detail should be added of the approach for conducting the economic impact analysis; for assessing the adequacy of risk financing and financial capacities; and for assessing the need for government intervention on risk financing.	Details on the approach for conducting the economic im have been provided under output 2.3. The analysis will a current financial capacity of local government authoritie risk financing,. Additionally, opportunities for compreh financial strategies for local government authorities and partnerships will be identified to undertake risk financi Malian context. The results of this analysis will inform i decision-making in the management of financial resourc

	addressing climate-related hazards. The precise approach to assess the components of this analysis – risk financing, financial capacity and the need for government intervention – will be developed during the project implementation.
STAP welcomes the engagement with the Malian scientific community and relevant scientific platforms, and looks forward to reading more details on how that engagement will be structured through the project	The scientific community will be represented principally by ENI-ABT (Abderhame Baba Touré National Education Institution for Engineers) and involved during the project lifetime. ENI-ABT will receive a number of training workshops to increase their knowledge on: i) climate monitoring (output 1.1); ii) operating and maintaining the EWSs (Output 1.2); iii) developing and using flood risk maps (Output 1.3); iv) implementing FRRPs (Output 2.1); and v) forecasting and predicting climate-related hazards (Output 2.2). In addition, the ENI-ABTwill also support the development of the long-term maintenance plan for the meteorological stations installed under output 1.1, and the design of flood risk reduction strategies for the targeted communities (Output 3.1).
STAP also welcomes the inclusion of teaching on risks and hazards in school curricula, and looks forward to reading how that will be further developed.	Output 1.4 will support the inclusion of awareness raising in school curricula by: i) raising awareness of inspectors, educational advisors and directors of primary schools about flood risks and the need for climate change adaptation; and ii) producing educational booklets on flood risk and climate change, including modules and manuals for teachers and children. However the school curriculum will be fully developed as part of the project implementation through consultations with the DGPC, the Ministry of Education, municipal and village authorities, NGOs and CSOs.
In Component 2, training could include components not just on climate change, but also on how development choices will affect future vulnerability in ways that could increase or decrease the risks of climate change	This aspect is addressed under output 2.1 through awareness rasing campaigns on for example the improvement of solid waste removal and management systems. Awareness raising campaigns will inform local communities on the impacts of uncontrolled solid waste management on their vulnerability in terms of access to clean water and climate change. The revision on building codes under output 2.2 will also provide alternative development choices that will reduce the risks of climate change and will highlight the vulnerability and risks arising from floods with the existing building codes.
The PIF mentions the need for drainage and sanitation systems in urban areas. This is undoubtedly the case, so it would be helpful for the full proposal to discuss the extent to which the project will address this need.	The barriers, identified as part of the “Development Challenge” section, explained the challenges resulting from the unadequate consideration of the expected annual floodwaters in the drainage systems. These annual floodwaters are leading to widespread sanitation problems and damage resulting in floodwaters of up to four metres in Bamako’s urban areas. In addition, the majority of peri-urban and rural areas do not have stormwater drainage systems in place. At those locations where such systems are present, inadequate land-use planning and management has led to many areas dedicated to stormwater management becoming inhabited, resulting in stormwater drainage system being used for solid waste, industrial waste and sewage disposal. To address the need for proper drainage and sanitation systems in urban areas, the project will include such consideration during the revision of building codes as well as by incorporating measures to ensure that future drainage systems are designed to take the predicted frequency and severity of future flood risks into account (output 2.2). The design of drainage systems will be complemented by a technical assessment of the existing stormwater drainage systems in the selected

	communes (output 2.1) that will support the extension of stormwater drainage system by 5 km in each commune (communes I, IV, VI, Sébékoro and Fatoma), as well as the rehabilitation and maintainance of existing drains (output 3.2)
In Outputs 3.1 and 3.2, it would be helpful to discuss how the project will ensure the choices made are robust to additional climate change.	Both outputs are conducting comprehensive assessments during project implementation that will take into account expected changes in climate. For example, under output 3.1, the assessment will include the identification of the appropriate plant species with climate-resilient properties to be used in this initiative according to expected future climate impacts. Similarly, under output 3.2 a feasibility assessment will be undertaken to determine the appropriate location of these permeable rock dams to maximise their efficiency in the context of climate change.
STAP appreciates the efforts to include gender into the proposed project, and looks forward to further development of this aspect in the full project proposal	A section on gender considerations in the project has been included as part of the "Strategy" section. A gender-sensitive approach has been adopted and will be followed during the project implementation to address the issue of gender inequality in Mali. The project will take gender consideration into account by encouraging as much as possible women participation to and benefits from the project interventions. For example, women will be supported to participate to the monitoring and management committees to be established under Output 1.2. Also, a gender specialist will be appointed under Activity 1.2.2 to support the use of a gender-sensitive and gender-responsive approach in developing the flood risk communication strategy.
STAP encourages including an explicit activity to develop a plan for scaling-up, including the amount of human and financial resources required	An explicit activity has not been added. Instead the development of plans and trainings that will ensure the continuation and scale-up of adaptation activities have been included. In particular the outputs under outcome 2 – namely: 2.1) the development of FRRPs; 2.2) the integration of flood risks into settlement and building codes; 2.3) the development and implementation of financial strategies to respond to climate related hazards; and 2.4) the enhancement of the technical capacity of the relevant national and local authorities on climate risk management planning as well as flood prevention and reduction measures – will provide relevant decision makers – including local authorities, DGPC, DNPD, DNUH, AEDD, DGCT and DNAT – with the tools and recommendations to scale-up the activities implemented by the project.
PIF Review sheet	
By CEO Endorsement, in absence of a clear NAPA priority on flood risk management, please demonstrate that the proposed project nevertheless addresses a national adaptation priority that has been identified through inclusive, multistakeholder consultation.	As stated in Annex 8, although there are no NAPA priority developed to specifically address floods, floods have been recognized as the third most important climatic risk in the NAPA. In addition, the project is aligned with two national policies, namely: "Poverty Reduction and Growth Strategy Paper (CSCRP, 2012-2017)" and "the National Plan for Multi Risk Preparation and Emergency Disaster Response (PNMRRC)".

ANNEX C: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS[62]

A. Provide detailed funding amount of the PPG activities financing status in the table below:

PPG Grant Approved at PIF: **150,000**			
Project Preparation Activities Implemented	***GEF/LDCF/SCCF Amount ($)***		
	Budgeted Amount	***Amount Spent Todate***	***Amount Committed***
Needs assessment and technical feasibility of adaptation options and measures	55,296.61	25,296.61	30,000.00
Project document development	34,611.34	-	34,611.34
Stakeholder consultation and engagement	60,092.05	60,092.05	-
Total	150,000.00	85,388.66	64,611.34

[62] If at CEO Endorsement, the PPG activities have not been completed and there is a balance of unspent fund, Agencies can continue to undertake the activities up to one year of project start. No later than one year from start of project implementation, Agencies should report this table to the GEF Secretariat on the completion of PPG activities and the amount spent for the activities. Agencies should also report closing of PPG to Trustee in its Quarterly Report.

ANNEX D: CALENDAR OF EXPECTED REFLOWS (if non-grant instrument is used**)**

Provide a calendar of expected reflows to the GEF/LDCF/SCCF Trust Funds or to your Agency (and/or revolving fund that will be set up)

United Nations Development Programme

Project Document for nationally executed projects
Financed by the GEF LDCF

Project title: Flood hazard and climate risk management to secure lives and assets in Mali.		
Country: Republic of Mali	**Implementing Partner:** Environmental Agency for Sustainable Development (AEDD)	**Management Arrangements:** National Implementation Modality (NIM)
UNDAF/Country Programme Outcome*:* **CPD Outcome 2:** By 2019, disadvantaged groups, particularly women and young people, benefit from increased capacities and productive opportunities in a healthy and sustainable environment conducive to poverty reduction.		
UNDP Strategic Plan Output: Output 1.4: Scaled up action on climate change adaptation and mitigation cross sectors which is funded and implemented.		

UNDP Social and Environmental Screening Category: Low	**UNDP Gender Marker: 2**
Atlas Proposal/Award ID : 00095070	**Atlas output Project ID :** 00099106
UNDP-GEF PIMS ID: 5855	**GEF ID:** 5236
Planned start date: 2016	**Planned end date:** 2021
FINANCING PLAN	
GEF LDCF	USD 8,925,000
UNDP TRAC resources	USD 800,000
Cash co-financing to be administered by UNDP	USD 500,000
(1) Total Budget administered by UNDP	**USD 10,225,000**
PARALLEL CO-FINANCING	
UNDP	USD 6,000,000
Government	USD 44,446,907
(2) Total co-financing	**USD 50,446,907**
(3) Grand-Total Project Financing (1)+(2)	**USD 60,671,907**

Brief project description:

Climate change impacts on Mali have already unfolded with increasing average temperatures (~0.2 to ~0.8□C) and decreasing average rainfall (~20% less precipitations) over the last 50 years. These changes in long-term climatic conditions have been compounded by extreme weather events such as droughts, floods, strong winds, sand storms and heat waves. An increase in the intensity and frequency of these climate-related hazards – in particular floods – is expected under the future climate change scenario. Such climatic conditions and the negative effects thereof will undermine the government's efforts to achieve national socio-economic development goals.

To support the country's socio-economic development under increased intensity and severity of floods, LDCF resources will be used to strengthen the capacity of national and local government authorities to effectively manage the risks and reduce the negative impacts of floods on local communities and infrastructure in Mali. The objective of the LDCF-financed project will be achieved through the delivery of three complementary outcomes in 51 local communities in the districts of Bamako, Kayes and Mopti. The interventions under Outcome 1 focus on increasing availability of – and access to – climate information including the generation and dissemination of climate forecast information and flood early warnings as well as awareness-raising on climate-related hazards. Under Outcome 2, Disaster Risk Management will be integrated into relevant policies, development plans and budgetary processes. Under Outcome 3, flood risk reduction interventions such as revegetation of riparian areas along wetlands, diversion of surface runoff through a network of canals, construction of permeable dams and stormwater drains will be implemented to improve rainwater management in flood-prone communities.

The interventions mentioned above will be implemented by the Environmental Agency for Sustainable Development (AEDD) and executed by the United Nations Development Programme (UNDP) over a five year period. The LDCF-financed project will contribute to decreasing the vulnerability of local communities to floods through securing their lives and livelihoods as well as protecting infrastructure in Mali.

SIGNATURES

Signature:	**Agreed by Government**	**Date/Month/Year:**
Signature:	**Agreed by Implementing Partner**	**Date/Month/Year:**
Signature:	**Agreed by UNDP**	**Date/Month/Year:**

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List of Acronyms and Abbreviations *NOTE to project developer:*

ABFN	Niger River Basin Agency
AEDD	Environmental Agency for Sustainable Development
ANICT	National Investment Agency for Local Communities
APR/PIR	Annual Project Review/Project Implementation Reports
AWP	Annual Work Plan
AWS	Automatic Weather Station
CAFO	Coordination of Associations and Women's Organisations
CCAT	Common Framework in Support to the Transition
CIGQE	Institutional Framework for Environmental Management
CNCC	National Committee for Climate Change
CNE	National Environment Commission
CNSC	National Framework Climatological Services
CPAP	Country Programme Action Plan
CPD	Country Programme Document
CSCRP	Poverty Reduction and Growth Strategy Paper
CSI-GDT	Strategic Framework for Investments in Sustainable Land Management
CSO	Civil Society Organisations
DGCT	Directorate General of Territorial Collectivities
DGPC	General Directorate for Civil Protection
DNA	National Directorate of Agriculture
DNACPN	National Directorate of Sanitation, Pollution and Nuisance Control
DNAT	National Directorate of Decentralised Administration
DNEF	National Directorate of Forestry and Water
DNCT	National Directorate of Local Authorities
DNGR	National Directorate of Rural Engineering
DNH	National Water Directorate
DNPD	National Directorate of Planning and Development
DNUH	National Directorate for Urbanism and Housing
DRC	National Directorate of Commerce
DRM	Disaster Risk Management
DRPIA	Regional Directorate of Animal Production and Industries
DRR	Disaster Risk Reduction
EIA	Environmental Impact Assessment
ENI-ABT	Abderhame Baba Touré National Education Institution for Engineers
ERC	Evaluation Resource Centre
EU	European Union
EUMETSAT	European Organisation for the Exploitation of Meteorological Satellites
EWS	Early Warning System
FAO	Food and Agriculture Organisation
FICAR	Risk Identification Form/Sheet
FNC	First National Communication
FRRP	Flood Risk Reduction Plans
GDP	Gross Domestic Product
GEF	Global Environment Facility
GIS	Geographic Information System
GoM	Government of Mali
IFAD	International Fund for Agricultural Development
IP	Implementing Partner
IWRM	Integrated Water Resource Management
LDC	Least Developed Country

LDCF	Least Developed Countries Fund
M&E	Monitoring and Evaluation
MASL	Metres Above Sea Level
MEADD	Ministry of Environment, Sanitation and Sustainable Development
MEF	Ministry of Economy and Finance
MoF	Minister of Finance
MSIPC	Ministry of Internal Security and Civil Protection
MTR	Mid-Term Review
NAPA	National Adaptation Programme of Action
NBA	Niger Basin Authority
NGO	Non-Governmental Organisation
NHMS	National Hydrological and Meteorological Services
NIM	National Implementation Modality
NTFP	Non-Timber Forest Product
OCHA	Office for the Coordination of Humanitarian Affairs
ORTM	Bureau of Radio and Television of Mali
PAC	Project Appraisal Committee
PAG	Government Programme of Action
PAGEDD	Support Programme for Environmental Management and the Promotion of Sustainable Development
PANCC	National Action Pan for Climate Change
PANGIRE	National Action Plan on the Integrated Management of Water Resources
PDESC	Economic, Social and Cultural Development Programme
PDS	Social Development Policy
PCU	Project Coordinating Unit
PNCC	National Policy on Climate Change
PNMRRC	National Plan for Multi Risk Preparation and Emergency Disaster Response
PNPE	National Policy on the Protection of the Environment
PPR	Project Progress Reports
PSDDM	Strategic Plan for Development in the District of Bamako
RTA	Regional Technical Advisor
SDG	Sustainable Development Goal
SLWM	Sustainable Land and Water Resources Management
SNC	Second National Communication
SNCC	National Strategy for Climate Change
SNDD	National Strategy on Sustainable Development
STP/CIGQE	Permanent Technical Secretariat of the Institutional Framework of Environmental Management Matters
SWM	Solid Waste Management
TAT	Technical Advisory Team
TE	Terminal Evaluation
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNICEF	United Nations Children's Fund
WFP	World Food Programme
WHO	World Health Organisation

I. DEVELOPMENT CHALLENGE

1. The Republic of Mali (hereafter Mali) is a landlocked Least Developed Country (LDC) in West Africa that extends across 1,241,238 km^2 of the Sahel-Saharan region. Mali is characterised by a relatively uniform and flat topography with an average altitude of ~500 metres above sea level. Currently, the population of Mali is estimated to be 16,955,536 people[1], of which ~75% live in rural areas. Poverty is widespread, with approximately half of the population living below the international poverty line of US$ 1.25 per day[2]. In 2012, poverty was further exacerbated by political instability in the country whereby the growth of the economy declined from 6% to -1.2%. These socio-economic and political conditions have undermined the ability of the Government of Mali (GoM) to achieve national development objectives such as those defined by the National Poverty Reduction and Growth Strategy Paper (CSCRP). This strategy promotes the sustainable development of the agricultural, fisheries, mining and energy sectors. However, several underlying barriers are likely to hinder Mali's socio-economic development. These barriers include *inter alia* the current degradation of the environment and natural resources, as described below.

2. The growth of the agricultural sector over the past decade has been underpinned by the expansion of cultivated land. This expansion of cultivated land, coupled with the widespread practice of slash and burn agriculture, has led to the large-scale removal of natural vegetation[3]. In addition to this degradation, the unsustainable harvesting of woodfuel – which accounted for ~90% of household energy use in 2005 – is causing extensive deforestation. Overall, the expansion of unsustainable agricultural practices combined with the increased demand for woodfuel has led to widespread ecosystem degradation in Mali. Decreased soil fertility and increased erosion resulting from widespread ecosystem degradation mentioned above have led to a decrease in agricultural productivity and the abandonment of cultivated lands[4].

3. Since the 1970's, an increase in average temperature has been observed across Mali. This trend is expected to continue, and climate models predict that by 2080 Mali's mean annual temperature will increase by 3-4°C relative to the annual temperature in 1980[5]. This represents a predicted temperature increase that is 1.5 times the global average, which will occur throughout all seasons but will be more pronounced in the rainy season[6]. In addition to increased temperatures, an observed change in climate in Mali is a decrease in average annual rainfall. For example, during the period 1971-2000, an average 20% decrease in rainfall was observed across the country relative to 1951-1970[7]. According to future climate scenarios, Mali will experience a decrease in average rainfall ranging from 5-10% from 2050 onwards relative to the period 1960-1990[8]. An increase in the spatial and temporal variability of rainfall is also likely to be observed. The variations in temperature and rainfall over the last few decades have been further compounded by climate-related hazards such as droughts, floods, strong winds, sand storms and heat

[1] CIA World Factbook. Available at https://www.cia.gov/library/publications/the-world-factbook/geos/ml.html. [Accessed on: 04 October 2015].
[2] UNICEF. 2013. Mali Statistics. Available at http://www.unicef.org/infobycountry/mali_statistics.html. Accessed on 15 October 2015.
[3] It is estimated that natural vegetation is removed from ~400,000 hectares of land annually. Source: UNEP. 2005. Connecting ecosystems and poverty in Mali.
[4] Climate change and poor management of natural resources. 2008.
[5] Since the 1970's, temperatures in the Sahel region5 have increased by 0.2-0.8°C relative to the average and the rate of increase has been more rapid than the global trend Source: Ministry of Environment and Sanitation: Environment and Sustainable Development Agency. 2011. Mali climate audit.
[6] The rainy season extends over 3 to 6 months and occurs from May to October in the south and from July to September in the north. Source: Ministry of Environment and Sanitation: Environment and Sustainable Development Agency. 2011. Mali climate audit.
[7] Since the 1970's, a greater temperature variation has been experienced in the areas characterised by a Sahelian climate as compared to other parts of Mali. Source: Ministry of Environment and Sanitation: Environment and Sustainable Development Agency. 2011. Mali climate audit.
[8] Ministry of Environment and Sanitation: Environment and Sustainable Development Agency. 2011. Mali climate audit.

waves[9]. It is predicted that the intensity and frequency of these climate-related hazards will increase under future conditions of climate change[10]. This will include an increase in intense rainfall events, which will in turn increase the occurrence of floods. The resulting effect is an increasing threat to lives and the built infrastructure in the country[11].

4. As a result of climate change, Mali is increasingly experiencing floods. From 1980-2007, two significant floods were recorded that collectively impacted over 3,000,000 people[12]. In addition, the floods experienced in Bamako in August 2013, affected over 34,000 people out of which ~20,000 were displaced[13]. These floods resulted in the death of 37 people and the loss of 280 homes in the capital city of Bamako[14]. In 2014, 98.5% of economic losses as a result of disasters are attributed to floods amounting to US$ 45,000,000 per year[15]. The areas most affected by floods over the last 30 years are located within the Niger delta[16] and include *inter alia* Bamako, Timbuktu, Gao, Mopti, Ségou, Kayes, Koulikoro and Sikasso[17]. Some of the floods experienced in Mali have reported to damage over 12,000 hectares of crops thereby negatively affecting the livelihoods.

5. Under the predicted conditions of climate change, an increasing number of climate-related hazards such as floods and heat waves is likely to occur. These hazards are predicted to increase in severity and frequency under future climatic conditions[18]. An increase in the severity and frequency of this hazard is likely to result in a larger number of flood-induced human deaths, people displaced, damages to houses and public infrastructure, and loss of crops. The above consequences of floods will have significant socio-economic impact in the country. Economic losses exceeding US$ 45,000,000 are likely to occur thereby undermining the GoM's efforts to address poverty and socio-economic development in the country.

6. The underlying causes of vulnerability of the Malian population to floods are:

- *Poverty*. Impoverished households are vulnerable to floods because of: i) widespread reliance on natural resource-based livelihoods, which are threatened by floods[19]; ii) limited availability of alternative livelihood options; and iii) limited technical and financial capacity to develop and implement adaptation interventions.
- *Land degradation*. There is widespread degradation of natural ecosystems because of inappropriate environmental management, overgrazing by livestock, unsustainable harvesting of woody vegetation for woodfuel, and the removal of natural vegetation to support agricultural expansion. Land degradation increases the severity of the effects of floods through the reduced infiltration of rainwater by degraded soils. In addition, land degradation results in increased soil erosion.
- *Limited financial resources***.** The GoM is limited in its capacity to finance a national response to climate change, including funding of investments in adaptation measures such as prediction, protection and management of floods.
- *Settlement pattern within the delta***.** Prolonged droughts since the 1970s have been experienced in the northern parts of Mali which have increased internal migration from the north to water resources

[9] Ibid.
[10] Ministry of Environment and Sanitation: Environment and Sustainable Development Agency. 2011. Mali climate audit.
[11] Ibid.
[12] During the same period, five major droughts were experienced. Of these, the most severe droughts occurred in 1980 and 2005 impacting ~1,500,000 and 1,000,000 inhabitants respectively and leading to the loss of lives, plantations and livestock. Source: EU. 2014. Update of Mali's environmental profile.
[13] OCHA. 2013. Rainy season overview: West and Central Africa.
[14] Ibid.
[15] Prevention web. Mali: Disaster and risk profile. 2014. Source: http://www.preventionweb.net/countries/mli/data/.
[16] The delta is inhabited by ~1 million people with the main town being Mopti with ~75,000 people. It is one of Mali's most significant producing areas with the three main production systems being livestock, agriculture and fisheries. Source: World Meteorological Organisation. 2004. The associated programme on flood management: Mali flood management-Niger River Inland Delta.
[17] Ministry of Environment and Sanitation: Environment and Sustainable Development Agency. 2011. Mali climate audit.
[18] Ibid.
[19] IFAD. 2012. Evaluation of the environment and climate change in Mali.

in the south[20]. The resulting effect of the rapid influx of people to the densely populated south of Mali is that many houses and infrastructure have been established on floodplains, river beds and basins. People living in these flood-prone areas are highly exposed to floods and are therefore vulnerable. In Mali, floods have resulted in the loss of many lives, livelihoods and houses as well as severe damage to structures.

7. To improve the economy in the face of ongoing socio-political challenges, ecosystem degradation and climate change, the GoM developed several sectoral and cross-sectoral policies, plans and strategies. These include *inter alia* the CSCRP, the National Policy on the Protection of the Environment (PNPE), the National Strategy on Sustainable Development (SNDD), the National Adaptation Programme of Action (NAPA), and the National Plan for Multi Risk Preparation and Emergency Disaster Response (PNMRRC).
However, the implementation of these policies and strategies has been limited. Contributory factors include weak institutional capacity and incoherence between existing policies and strategies. The barriers hindering the GoM's capacity to address floods in the country are discussed in the next section.

Barriers to increasing Mali's capacity to reduce and manage floods

8. There are several institutional, technical and financial barriers to effectively reduce and manage the effects of floods in Mali. The Least Developed Countries Fund (LDCF)-financed project will contribute towards overcoming the barriers limiting the implementation of effective flood reduction and management interventions by local government authorities in Mali, as listed below.

- *Limited capacity of national institutions to effectively predict floods and other climate-related risks*. At present, the availability and accessibility of reliable weather data is not sufficient to enable accurate prediction of rainfall and resultant flood risks by Mali-Météo and the DNH[21]. These institutions therefore have limited capacity to generate weather-related information to disseminate timely early warnings in the event that a flood is predicted. In addition, the national system for issuing flood warnings to the public is currently ineffective, particularly in rural areas. Flood warnings are broadcasted via means and languages that are not accessible to all local communities.

- *Limited knowledge and application of adaptation measures related to flood management*. In Mali, the authorities responsible for the design and application of flood protection measures – including *inter alia* Mali-Météo, the DNH and the DGPC – do not have sufficient experience developing or implementing effective flood protection measures. This is because over the past 30 years, measures to manage the effects of droughts have been prioritised in the country over flood disaster risk preparedness and recovery.

- *Limited skills and resources of planning authorities at local level* (municipalities and villages) to efficiently carry out responsibilities pertaining to flood risk management. An integrated approach to climate change adaptation is dependent on: i) the availability of data; ii) locally-appropriate methodologies; and iii) technical expertise to assess the potential physical and economic impacts of climate change and associated flooding in the country. The quality and availability of such data and expertise within Mali's local authorities is insufficient to develop detailed and locally-appropriate climate change adaptation strategies. Furthermore, there is minimal technical and financial support to local authorities to develop and implement flood adaptation interventions. In Mali, the ongoing processes of land use planning and urban planning are generally undertaken with limited consideration of factors related to climate change, including predictions of future vulnerability to climate-related hazards such as floods[22]. For example, the design of Bamako's urban drainage

[20] This migration pattern has furthered urbanisation in Mali. It is predicted that urbanisation will increase from 36% in 2010 to 60% by 2024, largely as a result of the predicted increase in frequency and severity of droughts in the north under the conditions of climate change and political instability. Source: International Organisation for Migration. 2013. The Mali migration at a glance.
[21] McSweeny, C., New, M. & Lizcano, G. 2010. UNDP Climate Change Country Profiles: Mali. http://country-profiles.geog.ox.ac.uk.
[22] Green Climate Fund Project/Programme Concept Note. 2015.

systems did not include adequate consideration of the likely volume of annual floodwaters. Consequently, past flood events have been characterised by widespread sanitation problems and damage resulting from floodwaters of up to four metres[23].

- *Limited transmission of information and warning to the relevant local communities*. The existing EWS was developed to cater for the Niger delta in Mali[24] and warns communities by means of: i) radio; ii) internet[25]; iii) phone calls to local key stakeholderss to reach villages; and iv) weekly news bulletins. However, such warnings are provided for large seasonal flooding events but exclude flash floods[26]. Moreover, the majority of the population – particularly the rural population of Mali – are unable to access these warnings.

9. Although no single initiative can address all of the barriers mentioned above, the LDCF-financed project will deliver complementary outcomes to contribute towards overcoming these barriers. The LDCF-financed project will also support furthering the CSCRP, the National Plan for Multi Risk Preparation and Emergency Disaster Response (PNMRRC), the NAPA, and Sustainable Development Goals (SDGs) 3, 5, 6, 9, 11 and 13. Please see Appendix 8 for the alignment of the LDCF-financed project with the national and international priorities contained in these documents.

II. STRATEGY

10. An increasing number of floods has been experienced in the last 30 years in Mali, which have resulted in human deaths and loss of livelihoods. As previously stated in Section I, floods experienced from 1980-2007 have adversely affected over 3,000,000 Malians[27] and are predicted to increase in frequency and severity under conditions of climate change. The LDCF-financed project will contribute towards achieving the long-term solution which is to manage and reduce the negative impacts of floods on communities and infrastructure in Mali. The theory of change adopted for this LDCF-financed project comprises addressing the barriers discussed in Section I while contributing to the preferred solution discussed below through the delivery of Outcomes 1, 2 and 3. The theory of change diagram is at the end of this section. The Problem Tree and Solution Tree leading to the development of the theory of change are attached as Appendix 9. The preferred solution pertains to increasing the resilience of local communities to floods in Mali and comprises the following:

- *Increased knowledge of risks associated with flooding to support the development of locally-appropriate plans and approaches*. The preferred solution would include strengthening the capacity of the relevant authorities in Mali – such as Mali-Météo, the DNH and the General Directorate for Civil Protection (DGPC) – to identify which regions are the most vulnerable to flooding under the predicted conditions of climate change. Through strengthening government capacity, the capability for using Geographic Information System (GIS) to map flood risks would be enhanced. In so doing, variables such as population density, land value, asset types and land use would be taken into account. Based on the mapping, locally-appropriate plans would be developed by municipal- and village-level authorities to reduce the risks related to floods. These plans would consider and include: i) modern techniques for flood risk reduction including *inter alia* the use of geospatial analyses and modelled climate change predictions to identify flood-vulnerable sites; and ii) traditional flood management measures used by communities, such as the construction of levees. In addition, technical staff from national and local government authorities, including *inter alia* Mali-Météo, DNH, DGPC and municipalities, will receive training on a wide range of approaches to flood protection such as the establishment of dykes and vegetative buffers thereby increasing their technical capacity

[23] Ibid.
[24] Cools, J. & Innocenti, D. 2014. Input paper prepared for the 2015 global assessment report on disaster risk reduction. The United Nations Office for Disaster Risk Reduction, Geneva.
[25] http://www.opidin.org/en is an early warning system tool designed for the Inner Niger Delta to predict the level and the timing of the flood peak as well as the maximal flood extent.
[26] Cools, J. & Innocenti, D. 2014. Input paper prepared for the 2015 global assessment report on disaster risk reduction. The United Nations Office for Disaster Risk Reduction, Geneva.
[27] EU. 2014. Update of Mali's environmental profile.

to use these approaches. Furthermore, the above-mentioned increased availability of information and technical capacity of the government authorities to respond to flood risks would support the adoption of a flexible approach to the management of floods according to the best available evidence at a particular point in time. This approach would be regularly updated in accordance with emerging information.

- *Implementation of flood management measures.* The preferred solution would include the identification and establishment of locally-appropriate flood management measures at sites that are identified as being at risk of flooding, both in the short- and the long-term as a result of predicted climate change impacts. Flood management measures would be complemented by the enhanced capacity of authorities – such as the DGPC, MEADD and Environment and Sustainable Development Agency (AEDD) – to integrate considerations related to flood risks into urban planning and infrastructural development. For example, existing building and settlement codes would be updated and revised to ensure that future infrastructural development includes consideration of flood risks in a meaningful manner. The revision of building codes would also incorporate measures to ensure that future drainage systems are designed to take the predicted frequency and severity of future flood risks into account. Such designs would be based on measured historical extremes of flood water levels and projected climate-related flood risks. Furthermore, the revision of building and settlement codes would include measures to ensure that infrastructural development incorporates adequate consideration of future needs and risks related to public sanitation. In so doing, the risks of outbreak of water-borne diseases associated with flooding – in both urban and rural areas – would be reduced. The implementation of these improved codes to include flood risks in infrastructural development would enhance the effectiveness of the physical flood management measures applied.

- *Increased flood preparedness*. The preferred solution would increase capacity at both the national – DGPC, MEADD, AEDD – and municipal level to respond timely to climate-related hazards, particularly floods. National disaster preparedness would be enhanced by establishing reliable early warning and monitoring systems. For hazards such as floods, Early Warning Systems (EWSs) based on modern technologies that are cost effective to maintain would be continuously operational – staffed 24 hours a day – and would allow for the timely and reliable dissemination of warnings to both urban and rural communities using media such as mobile phone platforms. To ensure the availability of sufficient public funds for disaster response measures, actions to increase the national preparedness for climate-related hazards would include the development of financial strategies to increase the allocation of funds to local government authorities within communes and villages to develop locally-appropriate strategies to decrease their vulnerability to floods. These financial strategies will cover: i) an emergency response; ii) the reconstruction of public assets and infrastructure; and iii) targeted financial assistance to those adversely affected by floods.

- *Increased awareness of floods and associated risks*. The preferred solution would incorporate an increased level of awareness of the risks of floods within both urban and rural communities. Capacity-building activities would include the provision of training to both national and local authorities on flood risks and management, as well as potential flood reduction methods – including management and prevention. To educate the public and increase their knowledge on climate change and associated flood risks, various forms of media would be used, including posters and radio broadcasts. In addition, education programmes would be implemented for school children, which would ensure increased long-term public awareness of flood risks and the adoption of appropriate responses during times of crisis.

11. LDCF finances will therefore be used to increase the capacity of the GoM, especially local government structures, to manage the risks of climate-related hazards such as floods. The LDCF-financed project has been designed to respond to Mali's national priorities and will support the implementation of national policies, strategies and plans. The national priorities targeted by the LDCF-financed project are detailed in Appendix 8. The institutional and policy context of this LDCF-financed project is attached as Appendix 10.

National and local benefits

12. National benefits: At the national level, the adaptation benefits generated by the LDCF-financed project will include building the overall capacity of the GoM to plan for and respond to floods. This will be achieved through training and capacity-building of government officials within Mali-Météo, DNH and DGPC at the national, district and commune levels. Targeted beneficiaries of the project's capacity-building activities will, at a minimum, include: i) 50 national-level representatives; ii) 50 district-level representatives (in each of three targeted districts); and iii) 100 commune-level representatives (in each of the seven targeted communes).

13 These stakeholders will benefit directly from capacity-building activities to improve the planning, design and implementation of GoM's activities to respond to climate-related hazards, particularly floods. In addition, the benefits of the LDCF-financed project will include: i) an increase in the total geospatial coverage of the national hydrological and meteorological monitoring (hydromet) network by at least 10%; and ii) the development of an enhanced EWS for monitoring and issuing flood warnings to vulnerable communities in Bamako, Kayes and Mopti. The total size of the population to be reached by the proposed EWS – designed specifically for floods – will include at least 20% of the population.

14. Local benefits: At the local level, the LDCF-financed project activities will deliver targeted adaptation benefits to 51 vulnerable local communities in the districts of Bamako, Kayes and Mopti, resulting in direct benefits for at least 1,200,000 people which amounts to 120,000 households. Within these target intervention sites, the project will introduce multiple measures to reduce vulnerability to flood risks, including both measures to increase resilience as well as decrease exposure to floods. Vulnerable local communities will benefit directly from the establishment of physical measures for flood protection including *inter alia* permeable rock dams and stormwater drains for water evacuation at priority flood-prone areas. In addition to providing physical flood protection, the project will implement awareness-raising activities on the management of floods to at least 500,000 people within communes I, IV and VI in Bamako, as well as Tomora in Kayes. The project's awareness-raising activities will also include campaigns to increase the knowledge of municipal and village officials on the management of public risks related to floods.

15. At the local level, the vulnerability of project beneficiaries to floods will be reduced through several measures including *inter alia*: i) dissemination of early warnings; ii) long-term resilience to floods as a result of the mainstreaming of flood risks in governing document such as the PDESC; and iii) improved capacity of stormwater drainage systems, through maintenance and extension of existing drainage systems in communes I, IV and VI of Bamako (please see Section III for the list of the activities selected to be implemented per site under the LDCF-financed project).

16. Municipal and village authorities in the seven communes that have been selected for LDCF-financed interventions will benefit from capacity-building activities. As a result, the communes' institutional, technical and financial capacity to develop and implement site-specific adaptation interventions will be strengthened. This will improve the management of flood risks and hazards thereby decreasing the vulnerability of local communities to these disasters. To promote a gender-sensitive approach in the development of the LDCF-financed project, representatives of CAFO[28] – an association of women's NGO groups in Mali – participated in several of the regional and local workshops in Bamako, Kayes and Mopti. The participation of CAFO ensures that a gender-sensitive approach recognising that floods affect men and women differently has been considered in the design of the LDCF-financed project. This project will also consider the effect of floods on other vulnerable groups such as children and the elderly. In so doing, the project will increase the adaptive capacity of the most vulnerable groups of Mali's society to floods.

Gender considerations

17. In 2014, Mali was ranked as a country with a "very high level of discrimination" in the Social Institutions and Gender Index developed by the Organisation for Economic Co-operation Development

[28] CAFO stands for Coordination of Associations and Women's Organisations.

Centre[29]. Although the National Gender Policy of Mali was adopted in 2010, customary practices in the country support gender inequalities and disparities[30]. Women in Mali have different access to income-generating activities than men. Indeed, women's roles are predominantly related to childcare and domestic life including raising children, water collection and wood harvesting[31]. Furthermore, as a result of unequal access to education and the labour market, women are more vulnerable to climate-related hazards.

18. The LDCF-financed project will take gender consideration into account and encourage as much as possible women participation to and benefits from the project interventions. Therefore, particular attention will be given to addressing the vulnerability and limited adaptive capacity to floods of both men and women. For example, women will be supported to participate to the monitoring and management committees to be established under Output 1.2. As a result of women participation, decision-making processes regarding the implementation of a strategy to decrease community vulnerability to climate-related hazards will take into consideration men and women livelihoods, expectations and priorities. In addition, to support gender-sensitive interventions, the collaboration initiated with CAFO at PPG phase will continue throughout the implementation phase.

19. As women's domestic life in Mali relate largely to raising children, water collection and wood harvesting, they become relatively more burdened than men in the event of floods. During floods, potable water sources – surface- and groundwater – become susceptible to contamination by microorganisms such as bacteria, sewage, agricultural or industrial waste, chemicals and other substances that can cause serious illnesses. Consequently, women have to walk relatively longer distances to collect water from areas that are not affected by floods to access safe potable water. In addition, water- and vector-borne diseases, such as cholera and malaria[32] respectively, spread rapidly after floods which affect children more than other population groups. As it is largely women's role to raise children, they are further burdened by floods as they have to attend to sick children. In light of the above, this LDCF-financed project has adopted a gender-sensitive approach by reducing and managing the impacts of floods in the country. The LDCF-financed project is therefore intrinsically gender-sensitive and will improve the quality of life of the women in the intervention sites. The needs and priorities of women have therefore been considered and integrated in the design of this project.

20. A gender specialist will be appointed under Activity 1.2.2 to support the use of a gender-sensitive and gender-responsive approach in developing the flood risk communication strategy. The scope of the works of the gender specialist will not be limited to Activity 1.2.2 alone but will undertake an evaluation of the LDCF-financed activities and provide a roadmap for promoting a gender-responsive approach throughout the project. The project team will report to the project board on how these recommendations have been included in the subsequent implementation of the LDCF-financed interventions. The gender specialist will develop additional gender-sensitive indicators for the relevant activities which will be monitored by the appointed M&E specialist in the Project Management Unit (PMU). Based on an assessment of the gender-responsiveness of the LDCF-financed activities, gender equality in accessing project's resources and the meaningful participation of women in the implementation phase, corrective interventions will be recommended. Moreover, the gender specialist will develop detailed indicators for the activities undertaken under Outputs 1.3 and 2.1 which pertain to flood risk mapping and the development of flood risk reduction plans, respectively. The flood risk mapping exercise will determine the flood risk reduction

[29] The following parameters were measured as part of this index: i) discriminatory family code including lower age of marriage, parental authority and inheritance for women (Mali score: very high); ii) restricted physical integrity that assess the legal framework against domestic violence, rape, sexual harassment as well as genital mutilation and reproductive autonomy (Mali score: very high); iii) son bias measuring female infanticide or health conditions (Mali score: high); iv) restricted resources and assets including access to land and non-land assets, and financial services (Mali score: medium); and v) restricted civil liberties comparing access to public place and political voice (Mali score: very high). http://www.oecd.org/dev/development-gender/BrochureSIGI2015-web.pdf

[30] UNDP. 2012. Gender equality and women's empowerment in public administration. Mali: Case Study.

[31] USAID. 2015. Addendum to the 2012 Gender Assessment.

[32] Ministry of Environment and Sanitation: Environment and Sustainable Development Agency. 2011. Mali climate audit.

interventions to be prioritised and implemented by local government authorities. It is therefore crucial that the socio-economic information collected under Output 1.3 is gender-sensitive as it will enable the development of gender-sensitive and gender-responsive flood risk reduction plans to decrease the vulnerability of women to floods in the future.

21. In addition to the flood risk maps and flood risk reduction plans, gender-responsive campaigns to raise awareness on building resilience to floods and adopting adequate solid waste disposal practices under Activities 1.4.2 and 2.1.5 will be undertaken. As their role pertain largely to raising children, women in Mali are likely to instil their increased knowledge on floods – including the underlying causes of floods and adaptation options – to their children. For example, as women adopt the adequate solid waste disposal practices following awareness-raising campaigns, their children – exposed to such practices – are likely to embrace them in the future.

22. Gender-sensitive indicators and targets have been developed to monitor the progress of the LDCF-financed project and will be refined by the baseline study. Gender-disaggregated data will be collected during project implementation to inform and update the project indicators. Furthermore, up to 50% participation of women (to be determined by the baseline study) will be targeted for each training activity as a prerequisite to hold the event. Trainers appointed by this project will be required to have the required skills and experience to plan and facilitate gender-sensitive training. The set of communication tools under Output 1.4 will also be selected in order to reach men and women similarly. Lastly, awareness raising on gender equity in the context of climate change will be incorporated into the training of government officials to encourage the implementation of gender-sensitive initiatives beyond the project lifespan.

Ongoing country interventions

23. Several GEF and non-GEF projects on adapting to climate change and managing climate risks and hazards are currently being implemented in Mali. Previous projects and programmes have largely focused on droughts and food security as a result of their frequency and severity – for example, five major droughts occurred from 1980 to 2007. Despite not being primarily focused on building resilience to floods, the ongoing initiatives in the country provide opportunities for knowledge exchange and synergies with the LDCF-financed project. These ongoing initiatives are described below.

24. An LDCF-financed project entitled "**Strengthening the resilience of women's producer groups and vulnerable communities in Mali**" is currently executed by UNDP in the districts of Sikasso, Kayes and Koulikoro. The objective of the project is to build the resilience of women subsistence farmers to the negative effects of climate change by improving access to water, promoting climate-smart agriculture, and diversifying their income. The project activities include *inter alia*: i) increasing the knowledge of women's subsistence farming groups on adaptation options; ii) restoring communal forests; iii) demonstrating land and water conservation techniques; and iv) developing and increasing access to agro-meteorological information. The implementation period is 2015–2019 with a budget of US$ 5,460,000. Lessons learned on best-practice adaptation options in the Malian context will inform the awareness-raising campaigns for the public and the training to be provided to government officials on reducing and managing the impacts of floods.

25. Additionally to the aforementioned LDCF-financed project, UNDP is one of the executing partners of the project entitled "**Programme for the support of the National Adaptation Strategy to Climate Change in Mali**", financed by Government of Germany and commissioned by the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB). The project has a budget of US$ 5,500,000 for the period 2014–2019. The objective of the project is to increase the resilience of vulnerable communities to climate change using an integrated approach to adaptation including ecosystem restoration and strengthening of production chains for ecosystem-based resources. Activities financed by the project include *inter alia*: i) the mainstreaming of climate change considerations into existing policies as well as planning and monitoring instruments; and ii) the identification of best-practice interventions to effectively manage the negative effects of climate change on local communities in collaboration with municipal authorities. In addition, the project activities include the expansion of the

network of weather stations. The LDCF-financed project will build on the work undertaken by the project described above by increasing the network of weather stations to improve the quality and quantity of weather-related information in the country. The lessons learned in the mainstreaming of climate change considerations into existing policies will inform the activities under Component 2 of the LDCF-financed project.

26. The project entitled "**Programme support for climate change adaptation in the vulnerable regions of Mopti and Timbuktu**" is financed by the Adaptation Fund – to the value of ~$8,500,000 – and implemented by UNDP over the period 2016–2018. The main objective of the project is to increase the resilience of vulnerable communities in Mopti and Timbuktu, and their adaptive capacity to climate change. In particular, Component 3 seeks to strengthen the capacity of local government institutions and communities on adaptation options. The knowledge gathered on the effectiveness of adaptation options implemented in the project described above will be shared with the LDCF project team and presented to government officials to increase their knowledge on climate change and adaptation options. The lessons learned in the awareness-raising campaigns undertaken in 20 local communities in Mopti and Timbuktu will inform the campaigns to be undertaken within the LDCF-financed project.

27. The project entitled "**Enhancing adaptive capacity and resilience to climate change in Mali's agriculture sector**" is financed by LDCF and Canada UNDP Climate Change Adaptation Facility. It is implemented by the National Directorate of Agriculture (DNA) and UNDP with a budget of $ 2,340,000 over the period 2010-2014. However, the project is still under implementation. The objective of the project is to enhance the adaptive capacities of vulnerable rural populations to the additional risks posed by climate change on agricultural production and food security in the country. The project targets several municipalities in the districts of Kayes, Koulikoro, Sikasso, Ségou, Mopti and Gao to increase their technical and financial capacity to manage the impacts of climate change on agricultural production and food security. Output 1.3 of the project described above pertains to developing adaptation financing strategies which will inform those to be developed under Output 2.3 of the LDCF-financed project. This exchange of lessons learned with the LDCF-financed project will be valuable in developing effective financial strategies that allow funds to be readily available and accessible by local government authorities to reduce and manage floods impacts in the country.

28. In 2007, the GoM established a fund entitled "**National support fund to local authorities**" which is managed by the ANICT. The establishment of this fund followed the decision to undertake decentralised governance in Mali in 1992. The fund supports the transfer of technical, institutional and financial capacities from the national government to decentralised authorities such as municipalities. It is used to: i) strengthen the capacities of regional, communal and local government authorities to promote socio-economic development in their respective area of jurisdiction; and ii) promote the development of the environment, education, water and health sectors at the regional, communal, and municipal and village scales. The technical and financial capacity of local government authorities will be further strengthened by the LDCF-financed project.

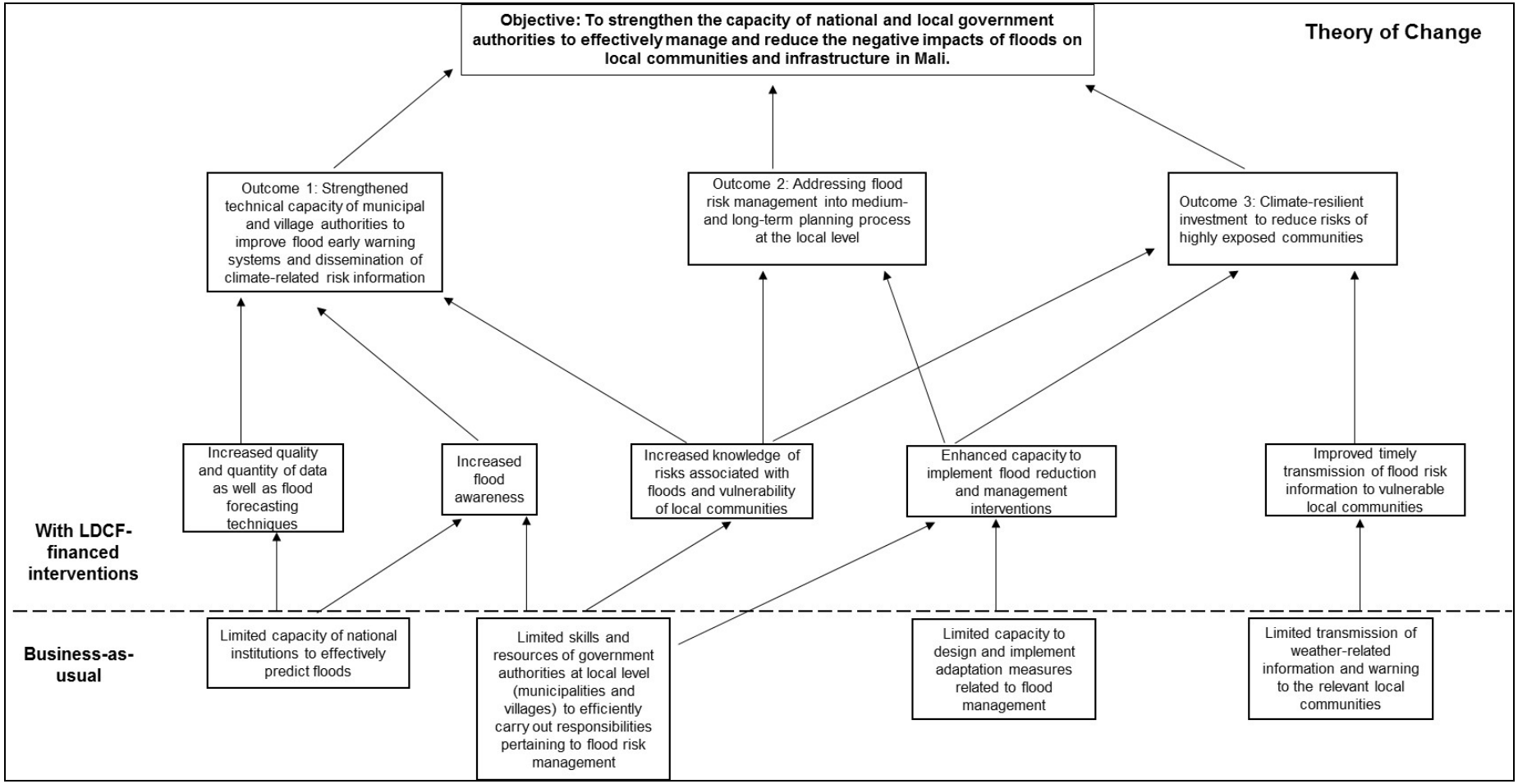

Figure 1: Theory of Change

III. RESULTS AND PARTNERSHIPS

29. The objective of the LDCF-financed project is to strengthen the capacity of national and local government authorities to effectively manage and reduce the negative impacts of floods on local communities and infrastructure in Mali. To achieve this objective, the project will support improved planning and decision-making within government authorities to respond to flood risks and hazards. This enhanced capacity of national and local government authorities to plan and implement locally-appropriate flood mitigation strategies will reduce the vulnerability of local communities to the negative effects of floods. The government authorities targeted by the project include *inter alia* the DNH, AEDD, Mali-Météo, DGPC, Directorate General of Territorial Collectivities (DGCT), National Directorate of Agriculture (DNA), National Directorate of Forestry and Water (DNEF), DNACPN, National Directorate of Planning and Development (DNPD), Bureau of Radio and Television of Mali (ORTM), National Directorate of Rural Engineering (DNGR), DRC, DNAT as well as municipal and village advisors. In total, 51 local communities spread across seven communes in the districts of Bamako, Kayes and Mopti will also benefit directly from LDCF interventions.

30. The objective of the LDCF-financed project will be achieved through the delivery of three complementary outcomes. Outcome 1 will increase the availability of data and information to guide the management of flood risks in municipalities and villages selected for LDCF interventions in the districts of Bamako, Kayes and Mopti. Outcome 2 will integrate flood risk management into relevant development planning policies and budgetary processes, thereby increasing the effectiveness of local DRM, DRR and response plans to flood hazards. Outcome 3 will invest in the demonstration of multiple flood reduction measures, including the establishment of infrastructure for flood protection and flood management, to benefit 51 local communities that are vulnerable to flood risks.

31. The LDCF-financed project will build on baseline projects to maximise benefits to the recipient local communities. Five ongoing baseline projects were identified in the country, namely: i) **annual budget of Mali-Météo to cover their operational costs** over the course of the implementation phase (co-financing of US$ 24,690,000); ii) **Project for stormwater drainage in Bamako** (co-financing of US$ 12,327,411); iii) **Project for the management of grey water and solid waste** (co-financing of US$ 4,929,496); iv) **Programme for the support of the National Adaptation Strategy to Climate Change in Mali** (co-financing of US$ 6,000,000); and v) **Support Programme for Environmental Management and the Promotion of Sustainable Development** (PAGEDD, co-financing of US$ 3,000,000). In addition, UNDP will provide a grant in-kind to the value of US$ 800,000 as co-financing for the LDCF-financed project.

32. As a national meteorological agency, Mali-Météo is responsible for the generation of weather-related information to guide decision-making to protect lives and secure assets in the country. Over the last few years, Mali-Météo has implemented several measures to provide accurate weather-related information in the context of climate change and weather forecasting. The GoM has financially supported the strengthening of the meteorological network and the development of accurate weather forecasts to prevent losses from climate-related hazards. The LDCF-financed project will build on the current initiatives undertaken by Mali-Météo and further reinforce its hydro-meteorological network through the addition of 10 hydrological and meteorological stations, and 150 pluviographs under Outcome 1. The above-mentioned equipment measures the intensity of rain and as such they are useful instruments to predict imminent floods. The pluviographs financed by the LDCF will increase the quality and quantity of data produced by Mali-Météo thereby enabling monitoring and predictions of floods. In addition, LDCF resources will be used to develop flood EWSs (a total of three) to disseminate early warnings in the intervention sites of Bamako, Kayes and Mopti. The establishment of these systems will strengthen Mali-Météo's capacity to deliver early warnings in the event of floods. The LDCF-financed project will deliver interventions to increase the technical capacity of Mali-Météo's technical staff to monitor weather-related information, analyse and interpret data from climate modelling software to generate accurate downscaled weather forecasts. The **annual budget of Mali-Météo to cover their operational costs** of the relevant activities of Mali-Météo to the LDCF-financed project amount to US$ 4,938,000 which adds up to US$ 24,690,000 considered as co-financing for the five years of project implementation.

33. The **Project for stormwater drainage in Bamako** funded by the GoM/Federal Government of Germany seeks to reduce flood risks in Bamako. This project is implemented by the MEADD from 2015 to 2020 with the objective of decreasing the vulnerability of local communities living in flood-prone areas in Bamako. To do so, the rehabilitation interventions for Tienkolé wetland in commune I and Ouéouyankou wetland in commune IV are undertaken as part of this project. The rehabilitation of these flood-prone wetlands aim to reduce flood risks thereby decreasing the vulnerability of the adjacent local communities. The LDCF-financed project will complement these flood risk reduction interventions implemented in Communes I and IV with the construction of permeable rock dams in these same communes.

34. The **project for the management of grey water and solid waste** implemented by the DNACPN/AGETIPE/CIRA and financed by the GoM is undertaking a study on the existing systems in 11 cities in Mali including Kayes and Mopti. This study is aligned with the LDCF-financed objectives because the inappropriate disposal of waste leads to blocked waterways which increases the risk of flooding following intense rainfall. The LDCF-financed project will build on the work undertaken by this project by undertaking awareness-raising campaigns with local communities on adopting appropriate waste disposal practices under Ouput 2.1.

35. The UNDP **Programme for the support of the National Adaptation Strategy to Climate Change in Mali** focuses on supporting the GoM to adopt an integrated approach to climate change and to support climate change-resilient development in the country – as stipulated in the National Adaptation Strategy to Climate Change in Mali. It is financed by the Federal Government of Germany and commissioned by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMU). With a budget of US$ 6,000,000 for the period 2014-2019, this project aims to increase the resilience of vulnerable local communities to climate change using an integrated approach to adaptation including ecosystem restoration and strengthening of production chains for ecosystem-based resources. Activities financed by the project include *inter alia*: i) the mainstreaming of climate change considerations into existing policies to inform planning; and ii) the identification of best-practice interventions to effectively manage the negative effects of climate change on local communities in collaboration with municipal authorities. In addition, this UNDP project will contribute to the expansion of the weather monitoring network through purchasing weather stations.

36. The LDCF-financed project will build on the interventions discussed above by further increasing the network of weather stations (under Outcome 1) to improve the quality and quantity of weather-related information in the country. In addition, the LDCF-financed project will further the benefits of the **Programme for the support of the National Adaptation Strategy to Climate Change in Mali** by mainstreaming the consideration of short- to medium-term flood risks into the PDESC to inform flood-resilient development planning in the intervention sites(Under Output 2.1.). The LDCF-financed project will build on the work undertaken by the project financed by the GoM/Federal Government of Germany to implement best-practice soft and hard flood risk reduction interventions. These interventions include rehabilitation of wetlands and the construction of permeable rock dams, respectively.

37. The AEDD is responsible for the coordination and the mainstreaming of environmental and climate change considerations in national – such as the PNPE – and sectoral policies. This agency currently implements the **Support Programme for Environmental Management and the Promotion of Sustainable Development** (PAGEDD) to promote sustainable development in the country and to incorporate climate change considerations in development programmes and projects. PAGEDD is implemented on a national scale. The LDCF-financed project will build on the work currently undertaken in Kayes and Mopti to increase the adaptive capacity of local communities. In addition, the work undertaken by PAGEDD in Bamako to improve the management of climate change risks will be furthered.

The three complementary outcomes of the LDCF-financed project are discussed below.

COMPONENT 1: Strengthened technical capacity of municipal and village authorities to improve flood early warning systems and dissemination of climate-related risk information.

OUTCOME 1: Strengthened technical capacity of municipal and village authorities to improve flood early warning systems and dissemination of climate-related risk information.

Co-financing amounts for Outcome 1: US$ 20,178,763
LDCF project grant requested: US$ 3,135,000

Without LDCF Intervention (baseline):

38. Currently, the majority of information and knowledge on the predicted effects of climate change in Mali is generated by regional institutions such as AGRHIMET and ACMAD[33], while several national government authorities are responsible for monitoring and forecasting Mali's climate. These government authorities are also responsible for issuing warnings on climate-related hazards and disasters, such as droughts, floods and locust plagues. The specific duties of these government authorities – including Mali-Météo – are described below.

39. The duties of Mali-Météo include *inter alia*: i) monitoring short- and long-term variables of Mali's weather and climate, such as rainfall and temperature; ii) issuing seasonal weather forecasts to assist farmers with planting preparation of crops during the wet season[34]; and iii) predicting and issuing warnings for climate-related hazards such as droughts. To fulfil its duties, weather data is collected by Mali-Météo from the national meteorological observation network, which comprises 190 synoptic stations, 54 climatological and agro-meteorological stations, as well as 214 rainfall observation systems. The observation network also consists of Meteosat receiver stations – established through the support of WHO[35], EUMETSAT[36] and AGRHIMET – two cloud-seeding airplanes and eight Automatic Weather Stations (AWS). The duties of Mali-Météo are complemented by those of the DNH, which is responsible for collecting and disseminating Mali's hydrological data. The DNH also operates and maintains a network of ~90 water-level observation stations on the Niger and Senegal Rivers. The Hydro-Niger project expanded the hydrological network by equipping 24 stations with telemetry systems, which are partially operational.

40. The meteorological and hydrological monitoring networks established by Mali-Météo and the DNH collect data around large settlements and valuable infrastructure, thereby limiting the spatial coverage of these networks. This reduces the capacity of these institutions to develop downscaled weather predictions. In addition, the delay in the transmission of data from hydro-meteorological stations to central offices also constrains the generation of accurate, timely early warnings for floods. As a result of these constraints, detailed spatial analyses of flood risks have not been undertaken, and communities in low-lying areas – including in the districts of Bamako, Kayes and Mopti – do not receive flood early warnings.

41. While Mali has implemented an early warning system for famine[37], no flood EWS has been developed at the national scale in Mali. Instead, the GoM's management approach to reduce the negative effects of floods emphasises community participation in the development and implementation of locally

[33] Ministry of Environment and Sanitation: Environment and Sustainable Development. 2011. Mali climate audit, Bamako.
[34] Ibid.
[35] WHO stands for World Health Organisation.
[36] EUMETSAT stands for European Organisation for the Exploitation of Meteorological Satellites.
[37] An EWS that issues warnings for famine and food security crises has been developed and implemented by the Ministry of Local Authorities under the authority of the Office for Food Security. The primary function of this EWS is to identify the: i) areas and segments of the population that are vulnerable to food crises; ii) timeframe and extent of the expected food crisis; and iii) estimated needs of the affected community to prevent a food crisis. The EWS issues monthly bulletin reports which are reviewed and adopted by a working group. This information is then published and distributed as a newsletter to international, national and local agencies to inform the adoption of recommended measures and prevent potential food crises.

appropriate solutions and strategies. In alignment with this emphasis on community participation, an interdisciplinary working group was developed to collate and disseminate advice and recommendations on locally appropriate flood reduction measures for farming communities. This guidance was well received by the communities and the lessons learned by the interdisciplinary group will inform the development of similar projects in the future. Since this initiative demonstrated the value of community participation in climate-risk management, in 2014 the DGPC undertook a risk identification process in all 703 communes in Mali using a Risk Identification Form/Sheet (FICAR). The purpose of this exercise was to develop a database and map climate risks to inform the development of DRM and DRR interventions. However, this information has not been integrated into development planning processes or authorities' responses to climate-related hazards. Mali's response to flood risks and hazards therefore remains uncoordinated, *ad hoc* and without consideration of the predicted effects of climate change.

With LDCF Intervention (adaptation alternative)

42. The LDCF-financed project interventions will strengthen the capacity of GoM to generate and disseminate information on floods. In particular, this Component of the project will focus on increasing the capacity of both Mali-Météo and DNH to collect, analyse and interpret climate-related data from a network of enhanced hydro-meteorological observation stations that will be established with LDCF resources. The interpretation and analysis of the data generated by these stations will supplement existing hazard mapping by providing: i) an updated analysis of the vulnerability of local communities – see Table 1 overleaf for the list of local communities receiving hydro-meteorological stations – to floods under the predicted conditions of climate change in the short- to medium-term; and ii) the location of infrastructure and public assets located within the project's intervention sites that are at risk of floods. The project will integrate data generated by past initiatives to inform the analyses of localised flood risks. For example, data generated by the DGPC in 2014 through FICAR will be included in the flood risk analyses. Increased availability of quality data and information on site-specific flood risks will inform the development of improved models for predicting vulnerability to floods and for issuing flood early warnings. An EWS for each intervention district – three in total, i.e. Bamako, Kayes and Mopti – will be implemented and will supplement and strengthen existing systems to decrease the vulnerability of local communities to climate-related hazards.

43. Under Outcome 1, the national hydro-meteorological observation network operated by Mali-Météo and the DNH will also be extended through the provision of 10 additional meteorological and hydrological stations as well as 150 pluviographs. The selection of the specific types of monitoring equipment was undertaken in consultation with the National Hydrological and Meteorological Services (NHMS) to identify the most appropriate and cost-effective options for Mali's context. These hydro-meteorological stations will be established in flood-prone areas of the intervention sites subject to an assessment by a national meteorologist. The increased geospatial coverage of Mali's hydro-meteorological observation network will support the increased accuracy and timeliness of weather forecasts and flood early warnings.

44. Flood risk mapping of the main assets at risk in each intervention district will be undertaken through the activities of the LDCF-financed project. To determine the impact of floods on built infrastructure, an inventory of flood-vulnerable assets and the likelihood of potential damage during flood events will be developed. The information generated by this flood risk analysis will inform a study of the potential socio-economic costs of damage and losses resulting from floods according to different flood risk scenarios.

Output 1.1.: A sound climate information system comprising devices operating 24 hours a day to monitor and forecast flood risks and hazards is established.

45. Under this output, the LDCF-financed project will increase the capacity of Mali-Météo, the DNH, DGPC, AEDD, as well as municipal and village authorities to monitor climate conditions and issue reliable, accurate and timely flood forecasts. The scientific community of Mali – represented by the Abderhame Baba Touré National Education Institution for Engineers (ENI-ABT) – will also increase their knowledge and expertise on climate monitoring.

46. As part of their ongoing operational practices, Mali-Météo undertakes regular assessment of the status of its existing stations and other weather-related equipment. Based on a recent evaluation, Mali-Météo has determined that 10 meteorological and hydrological stations need to extend its network to accurately forecast floods and hazards. Consequently, the strengthening of Mali's hydro-meteorological monitoring network will include the use of LDCF resources to procure and install monitoring equipment, including *inter alia* 10 meteorological and hydrological stations and 150 pluviographs. The meteorological and hydrological stations will measure the increase in water level and rainfall intensity to complement the pluviographs. The information generated by these equipment will determine imminent flood risks in the interventions sites.

47. A national meteorologist will be appointed to determine the appropriate type of meteorological and hydrological stations required to extend Mali-Météo's network. New meteorological and hydrological stations will be installed in 10 local communities in the districts of Bamako – see Table 1 below. The exact location of these stations will be determined by the appointed national meteorologist. This meteorologist will also train the relevant stakeholders on the operation and maintenance of these stations, as well as the monitoring and forecasting of climate-related risks.

Table 1: Number of meteorological and hydrological stations to be installed.

District	Circle	Commune	Number of meteorological and hydrological stations to be installed
Bamako	Bamako	Commune I	2
	Bamako	Commune IV	2
	Bamako	Commune VI	2
Kayes	Bafoulabe	Tomora	1
	Kita	Sebekoro	1
Mopti	Bandiagara	Pignari Bana	1
	Mopti	Fatoma	1

48. The suppliers of the meteorological equipment discussed above will train the relevant officials from Mali-Météo, the DNH, DGPC, AEDD, ENI-ABT as well as municipal and village authorities on the operation and daily maintenance of the equipment. In addition, the suppliers will compile simple technical guidelines on the operation and daily maintenance of the equipment to promote their sustainability. There are, however, several cultural and attitudinal barriers within Mali-Météo that restricts the use of modern technology in the weather sector. This is a result of the emphasis within Mali-Météo on conventional technologies, which are difficult to maintain by the relevant authorities. These barriers have been partially addressed through the participatory approach adopted in the design of the LDCF-financed project. The involvement of Mali-Météo in the development of the project's interventions – to ensure that LDCF finances are used to address their needs – promotes their support during implementation phase. In addition, these barriers will be overcome through the delivery of training workshops and technical guidelines to explain the benefits of using such technologies to improve the capacity of Mali-Météo's to monitor weather. The training of the technical staff from Mali-Météo will provide the necessary information on operating and maintaining the meteorological and hydrological stations, thereby enhancing their technical capacity and reducing the prevailing attitudinal barriers.

49. By installing the monitoring equipment mentioned above within the project intervention sites, the project will increase the total geospatial coverage of the national monitoring network. This equipment will also provide the necessary data to generate flood forecasts. Mali Météo and DNH will be responsible for operating and maintaining the improved hydro-meteorological network within their ongoing line responsibilities. In addition, Mali-Météo will ensure the sustainability of the long-term operation and maintenance of the procured equipment during the project's lifespan and after its closure. A long-term maintenance plan will be compiled and implemented by the appointed national meteorologist to prevent the degradation of the stations. This long-term maintenance plan will be developed in collaboration with Mali-Météo, the DNH, DGPC, AEDD, ENI-ABT as well as municipal and village authorities.

50. To improve Mali's geospatial coverage of the national monitoring network, the existing weather stations in Kita (Kayes), Sotuba (Bamako), Douentza (Mopti) and Bandiagara (Mopti) will be repaired. These stations have been identified for repair following a regular evaluation of the status of Mali-Météo's stations and equipment. The repair of these stations will improve the quality of weather-related information generated in the country and subsequently communicated to the public. The improved weather monitoring network will therefore increase Mali-Météo's weather monitoring and forecasting capacity.

51. One of the LDCF-financed project's interventions consists of the purchasing of a climate modelling software that will be used to generate accurate downscaled weather forecasting on a national scale. An assessment of the software currently used by Mali-Météo and the demands from the private and public sectors will be undertaken to determine the climate modelling software required. Officials of Mali-Meteo will be trained on the use of the software, methods for data monitoring and the interpretation of the information to generate weather forecasts for the use of the public. Journalists will also be trained to accurately convey the downscaled weather forecasts generated by Mali-Meteo to the population via the radio and TV broadcasting channels – which will require working agreements between Mali-Météo and radio and TV broadcasters. These agreements will be facilitated by a national communication specialist, who will also be responsible for establishing agreements with potential sponsors.

52. In addition to generating information for the general public, the climate modelling software will allow Mali-Météo to produce tailor-made forecasts for specific sectors as a payed service. The need for tailor-made weather forecasts will be determined by a market analyst to identify the opportunities in the private weather forecasting industry in Mali. The market analysis will determine the likely revenue that can be derived from such a service by Mali-Météo. Based on the findings of the market analysis, the appointed international meteorologists will train the relevant Mali-Météo officials on generating such information. The income stream generated by this service will contribute towards maintaining, repairing and/or purchasing new weather stations to improve the quality and quantity of weather-related information in the country.

Indicative activities under Output 1.1 include:

1.1.1. Procure and install 10 meteorological and hydrological stations in the intervention sites – i.e. two stations in communes I, IV and VI of Bamako (six in total), and one in each selected commune in the districts of Kayes and Mopti (4 in total). Training material and guidelines on the operation and maintenance of the equipment installed will be developed and disseminated to the relevant stakeholders. In addition, a long-term maintenance plan for the meteorological and hydrological stations will be developed and implemented.

1.1.2. Procure and install 150 pluviographs in the intervention sites - 50 pluviographs per district. Training material and technical guidelines on the operation as well as a long-term maintenance plan will be developed and disseminated to all the stakeholders operating the pluviographs.

1.1.3. Undertake an equipment needs assessment of the existing weather stations in Kita, Sotuba, Douentza and Bandiagara and repair equipment as required to improve data monitoring and transmission.

1.1.4. Generate accurate downscaled daily, weekly and seasonal weather forecasts for the public. Undertake a market analysis to determine the needs and opportunities in the private weather forecasting industry in the country for downscaled tailor-made weather forecasts. Train the technical staff of Mali-Météo on generating and communicating such information to the private sector.

Output 1.2.: Early warning and quick-response systems are developed to increase the resilience of vulnerable local communities in the intervention sites.

53. LDCF resources will be used to design and implement site-specific EWSs and quick-response systems at the intervention sites. A total of 32 sensors and audible warning devices will be installed as part of the site-specific flood EWSs. These systems will be carefully designed by an international flood EWS specialist to ensure maximum efficiency and coverage. This EWS specialist will also oversee the implementation of the EWSs in each intervention district. The relevant technical staff from Mali-Météo,

DNH, DGPC, DNUH, ENI-ABT, as well as municipal and village authorities, will receive training and technical guidelines on operating and maintaining the EWSs. In addition, a long-term maintenance plan will be developed and implemented by the appointed flood EWS specialist to support the sustainability of these systems beyond the project's lifespan. Mali-Météo will assume primary responsibility for the operation and maintenance of the EWSs implemented under this output during and after the project's lifespan. The relevant municipal and village authorities will enter into agreements with Mali-Météo to undertake some of the small-scale maintenance duties on the EWSs.

54. To promote the effectiveness of early warnings, a detailed flood risks and hazards communication strategy will be developed under this output. The design of this communication strategy will involve extensive consultation with local communities to ensure that the early warnings that are generated are in local communities' preferred language and are standardised across all communication platforms. In addition, to increase the capacity of communities to understand and respond to flood warnings, the LDCF-financed project will undertake awareness-raising activities on the interpretation and response to early warning messages.

55. The design of this project's interventions will benefit from the experiences of multiple past and ongoing initiatives – particularly the UNDP Africa Climate Information and Early Warning Project. Although the project mentioned above did not address early warning in Mali, it generated climate information and will provide useful experience-based knowledge and lessons learned on the analysis and dissemination of these information. The LDCF-financed project will also build on the approaches used by existing EWSs in the country – such as the seasonal rainfall forecasts issued by the Mali-Météo – while promoting the use of new and innovative methods for communicating early warnings, such as *inter alia* sirens, SMS, and rural radio broadcasts. To use these channels of communication, MoUs will be developed with radio broadcasters and telecommunication companies. In addition to these communication channels, early warnings will reach rural communities through the monitoring and management committees established under this output – which will target the members of their respective local communities who are outside of reach of the coverage area. Consequently, the use of multiple communication media will support the delivery of warnings to a diverse audience – including local communities located in remote rural areas who might otherwise not receive warnings via conventional media (e.g. newspapers or television broadcasts). Warnings will be adapted based on the level of literacy, education of the target audience, and other variants such as access to technology.

56. The monitoring and management committees established under this output – comprising of representatives of local communities – will work in collaboration with Mali-Météo. These committees will be developed with the appropriate structures and will enter MoUs with Mali-Météo. The primary functions of the monitoring and management committees includes: i) holding regular training workshops with the local communities to increase their understanding of flood risks, their severity and the corresponding response to be adopted, as well as the different categories of warnings according to the flood risks and hazards communication strategy; and ii) disseminating early warnings to members of their respective local communities that are outside of the coverage zone of early warnings. A national communication specialist will be appointed to facilitate the establishment and functioning of the monitoring and management committees and will identify and implement measures – where possible – to make them operational beyond the project's lifespan.

57. Multiple awareness-raising activities and training workshops with representatives of local communities and the media, as well as NGOs and local government authorities will be undertaken. The awareness-raising activities will emphasise the role of the media as an important tool for public education and for disseminating accurate information on the effects of climate change, with a particular emphasis on floods. Training workshops will enhance the capacity of journalists to convey early warnings and other climate-related information in a coherent and accessible approach to the general public.

58. Under this output, a gender specialist will be appointed to support the development of a gender-responsive flood risks and hazards communication strategy. This strategy will be developed in consultation with women from the selected local communities to support: i) the dissemination of early warnings which are readily accessible to women; and ii) the formulation of responses to the different

warning categories which are determined by the needs of women. The role of the gender specialist will not be limited to this output alone, but will develop a roadmap for mainstreaming gender considerations into the LDCF-financed activities. This will subsequently support gender equality in the implementation of the project and to promote the participation of women in a meaningful and equitable manner to the project resources. Please refer to Section II for more information.

Indicative activities under Output 1.2 include:

1.2.1. Implement flood early warning audio alert systems comprising 32 sensors and audible warning devices – a total of seven in Bamako, 11 in Kayes and 14 in Mopti – to generate early warnings.

1.2.2. Develop a detailed flood risks and hazards communication strategy based on the input of a gender specialist and in collaboration with the local communities. This strategy will comprise: i) preferred methods of communication of potential flood risks and hazards per commune; ii) the preferred language of warnings; iii) the description of a standardised category of warnings to be used across all means of communication; and iv) commune-specific responses to be implemented by the local authorities and communities for each warning category such as evacuation plans.

1.2.3. Establish monitoring and management committees between the selected communes and Mali Météo to effectively disseminate flood warnings. These committees will also periodically provide training to local communities on the different warning categories and the appropriate responses to be adopted.

Output 1.3.: Risk mapping combining flood risks with socio-economic indicators – including inter alia population-related indices, land value, land uses, assets – is undertaken.

59. A flood risk analysis will be undertaken for each intervention site in Bamako, Kayes and Mopti based on flood risks and exposure – determined under this output. This risk analysis will comprise three datasets, namely: i) flood risks and exposure of local communities within the intervention sites in the short- to medium-term; ii) socio-economic information including *inter alia* population-related indices and sources of livelihoods; and iii) land use information including *inter alia* the location of assets such as public infrastructure – e.g. buildings, roads and bridges – and human settlements. By combining the three datasets mentioned above in GIS, maps showing the location of the vulnerable communities in the short- to medium-term will be produced. In addition to these maps, the contributing factors to the vulnerability of local communities will be determined from the GIS datasets created. Furthermore, a flood risk index will be developed to facilitate the identification and prioritisation of the local communities requiring DRM interventions to reduce the impacts of floods in the short to medium term. The flood risk maps in conjunction with the index developed under this output will increase the technical capacity of the local government authorities to plan and implement DRM interventions in the intervention sites and to guide development planning. The technical staff from the DGPC, DNPD, AEDD, Mali-Météo, DNH, ENI-ABT, other line ministries as well as municipal and village authorities will receive training on the: i) collection and analysis of the relevant data; ii) development of the datasets; iii) generation of the flood risk maps; and iv) the use of the flood risk maps as planning tools for DRM interventions and development planning.

60. The detailed geospatial datasets developed through the flood risks and exposure analyses undertaken in the intervention sites will be integrated into the AEDD Information System during the project's lifespan. This system was established by the SLWM program, which manages online environmental information. By integrating information – such as the predicted short- to medium-term vulnerability of local communities to floods – into the AEDD Information System, this output will support the consideration of climate change adaptation into the ongoing activities of the AEDD Information System, particularly related to management of land and water resources. The information generated under this output and provided to the AEDD will be made available and accessible to the public. Flood risk maps will be displayed in schools, display boards and municipal and village authorities' offices as part of the awareness-raising campaigns under Activity 1.4.2. These maps will allow members of local communities to enhance their understanding of their vulnerabilities to floods.

61. Under this output, the socio-economic costs of floods will be quantified in the short- to medium-term. Quantifying these costs will inform an assessment of the financial vulnerabilities[38] of the local economy to effectively implement DRM interventions within the interventions sites. In addition, by providing a clear understanding of the costs associated with floods – to both local communities and relevant government authorities – the project's activities will incentivise DRM-related government structures to reduce the risks, and improve the management, of floods. Alternative adaptation options for flood management within the Malian context will also be developed and assessed in collaboration with academic partners such as local universities or research centres. The results of such an assessment will be communicated to the relevant national and local partners at communication events to be included in future NAP-related activities.

Indicative activities under Output 1.3 include:

1.3.1. Determine short- and medium-term flood risks and exposure based on updated and downscaled climate models. Map the areas that are exposed to floods are at risk in the short to medium term.

1.3.2. Collect and analyse socio-economic data based on indicators – including *inter alia* population-related indices, settlement patterns, land uses and value, sources of livelihoods and infrastructure – and determine any projected change scenarios in these variables in the short and medium term.

1.3.3. Develop an inventory of flood-vulnerable assets in the communes selected for LDCF interventions to prioritise DRM interventions.

1.3.4. Undertake short- to medium-term risk mapping using GIS to overlay flood risks and exposure data (as determined in Activity 1.3.1), socio-economic information (Activity 1.3.2) and flood-vulnerable assets (Activity 1.3.3.). Develop a flood risk index to facilitate planning of DRM interventions. The flood risk maps will be made accessible to the public.

1.3.5. Quantify the socio-economic costs of floods in the short to medium term based on risks, vulnerability of local communities and potential loss or damage to assets located in flood-prone areas, taking into account possible future development plans. The costs and benefits of alternative adaptation options for flood management will be analysed with the engagement of local universities/research centres. The results of this work will be integrated into the ongoing NAP-related activities.

Output 1.4: An education programme and awareness-raising campaign is undertaken within schools and local communities to build a culture of safety and resilience to floods.

62. The interventions of this output will entail the integration of an education programme on local climate-related hazards, particularly floods, into the curriculum of schools. This integration will be accomplished through i) raising awareness of inspectors, educational advisors and directors of primary schools about flood risks and the need for climate change adaptation; and ii) producing educational booklets on flood risk and climate change, including modules and manuals for teachers and children. In addition, training workshops will be conducted with the public on designing and implementing locally-appropriate interventions to build resilience to floods. The school curriculum and training workshops discussed above will be developed in collaboration with the DGPC, Ministry of Education, municipal and village authorities, NGOs and CSOs.

Indicative activities under Output 1.4 include:

1.4.1. Develop and integrate an education programme in the school curriculum and raise awareness on the prevention of climate risks, in particular floods, to decrease the vulnerability of school children.

1.4.2. Conduct awareness-raising campaigns through training workshops, radio and TV broadcasts, display boards, skits and SMS on building resilience of local communities to floods.

COMPONENT 2: ADDRESSING FLOOD RISK MANAGEMENT INTO MEDIUM AND LONG TERM PLANNING PROCESS AT THE LOCAL LEVEL

OUTCOME 2: Effective flood risk management mainstreamed into the relevant development planning policies and budgetary processes to increase the resilience of local communities.

[38] Financial vulnerability is a function of the distribution of risks and financial capacities to absorb the costs to be incurred as a result of climate-related hazards and natural disasters.

Co-financing amounts for Outcome 2: US$ 12,611,727
LDCF project grant requested: US$ 1,514,000

Without LDCF interventions (baseline):

Institutional and technical capacity to address disaster risk management

63. Existing legislation, such as the Local Governance Regulations of 2012, was drafted to promote a decentralised approach to governance in Mali. Under these regulations, local government authorities are empowered to provide public services and infrastructure and participate in activities such as disaster management, as well as to maintain and improve livelihoods under conditions of climate change[39]. In addition, these regulations highlight the potential role that can be played by local government authorities within Mali's 703 communes as part of the national response to climate change[40]. However, the potential contribution of local authorities to decentralised governance is undermined by the limited influence of these stakeholders on high-level decision-making, which is traditionally undertaken by national authorities. For example, the national climate planning process in Mali and the associated funds are managed by national authorities. Local authorities therefore have limited input into the planning process and the allocation of funds for climate change adaptation and mitigation within their respective communes. In addition, although the management of natural resources has been entrusted to local government authorities, they are generally managed by national agencies within the MEA[41]. This has resulted in a limited transfer of skills from national to local government authorities[42], thereby hindering effective DRM planning and implementation at the local level.

64. In Mali, several government institutions are responsible for developing and implementing DRM activities. These institutions include *inter alia* DGPC, DNH, ABFN, DNACPN, AEDD and DNGR. The DGPC also facilitates the participation of regional and local authorities – such as governors of circles, municipal staff and village advisors – in decentralised DRM activities. However, many of these local authorities have limited capacity to implement DRM interventions. To address this, both the national government and UNDP have delivered training to selected local government authorities to increase their capacity to develop and implement measures to improve local governance and the safety of communities. The training activities are largely related to: i) improving the core competencies of local government authorities and officials to consolidate local development; ii) strengthening social cohesion; and iii) implementing the necessary measures to enhance community safety.

65. Despite ongoing efforts by the GoM and UNDP to increase the institutional and technical capacity of local government structures such as municipalities and village authorities, these institutions have insufficient institutional resources and technical skills to effectively address the adverse effects of climate change in the country. The limited knowledge on topics such as climate change and climate-related hazards within government authorities has led to the inconsistent and *ad hoc* planning of DRM. As a result, climate change and climate-related hazards are not meaningfully considered in development planning. Measures to avoid or manage climate-related risks – particularly floods – have also not been integrated into existing building codes in Mali. The resulting effect is the increased vulnerability of communities in Bamako, Kayes and Mopti – particularly in those areas within these districts where rapid urbanisation has resulted in the expansion of settlements into unsuitable low-lying or flood-prone areas. Under the predicted conditions of climate change, an increase in human deaths, the loss of livelihoods and livestock as well as damage to structures and public infrastructure will occur as the frequency and severity of floods increases in Mali[43].

[39] See National Consultant's Report attached as Appendix 12.
[40] Ibid.
[41] Ibid.
[42] EU. 2014. Update of Mali's environmental profile.
[43] Pan African Climate Justice Alliance. 2009. The economic cost of climate change in Africa.

66. Mali has limited access to software and tools to support decision-making related to the forecasting of floods. The limited availability of skilled human resources, modern equipment and the up-to-date transfer of data from the observation network has undermined the capacity of the country's public authorities to accurately forecast climate-related hazards, such as floods at a local scale. This limited capacity to forecast floods reduces the effectiveness of the DRM interventions. Furthermore, restricted availability of downscaled maps detailing site-specific vulnerabilities to hazards such as floods hinders the development of locally-appropriate flood risk reduction interventions, thereby undermining the effectiveness of Mali's current approach to DRM and climate change adaptation.

Disaster risk management financing mechanism

67. The National Investment Agency for Local Communities (ANICT) was created in 2000 and has invested in a total of 11,792 projects in Mali. Funding from ANICT is used by local government authorities to undertake a suite of interventions to increase access to service delivery in local communities. These interventions, implemented by local government authorities, include improving access to drinking water by constructing wells and boreholes. However, the resources available from ANICT that are prioritised for disaster risk management and emergency relief are limited. In addition, there is currently limited information on the costs associated with the losses and damage caused by floods in the country. As a result, the financial vulnerabilities of the affected communities are not well understood, particularly their: i) exposure to risk; and ii) financial capacity to absorb risks. As a consequence of the knowledge gap on flood-related loss and damage costs in Mali, the Ministry of Finance (MoF) and local financing institutions are insufficiently equipped to use risk financing[44] and risk transfer tools[45] to decrease the financial vulnerabilities of government authorities, businesses and households. Furthermore, the existing DRM financing mechanism comprises state budget allocations, relief funds from municipalities and reallocations from other state departments following disasters. This financing mechanism is not sufficiently developed to address the current and future needs for the implementation of DRM interventions such as flood protection measures in Bamako, Kayes and Mopti. The existing mechanism is also not flexible enough to mobilise the necessary funds for effective disaster management. The establishment of site-specific financial strategies is therefore required to increase the resilience of the local communities to rapid onset hazards such as floods.

With LDCF interventions (adaptation alternative)

68. Under the predicted conditions of climate change in Mali, there will be an increase in the severity and frequency of climate-related hazards. The LDCF-financed project's interventions under Outcome 2 are therefore designed to promote effective DRM planning and implementation in Mali. Activities under this Outcome include reforms to existing policies to increase the effectiveness of flood risk management in the country. This policy reform will include the development and implementation of Flood Risk Reduction Plans (FRRPs) in the project's intervention sites in Bamako, Kayes and Mopti. These plans are fine-scale decision support tools, particular in the context of the municipalities and villages in Bamako, Kayes and Mopti. The FRRPs will include site-specific measures developed in collaboration with local communities to reduce their vulnerability and exposure to floods. This policy reform will support the integration of the FRRPs into local development planning in the districts Bamako, Kayes and Mopti to increase the resilience of the local communities to floods in the short and medium term.

69. Funds from the LDCF will be used to develop financial strategies to facilitate timely access to economic resources by local government authorities to address climate hazards. This increased financial capacity will empower the MoF and local financing institutions to: i) establish a financial mechanism in the

[44] Risk financing is defined as "strategies and instruments used to manage the financial impact of disasters, ensuring adequate capacity to manage and mitigate the costs of disaster risk, thereby reducing the financial burden and economic costs of disasters and enabling rapid recovery in economic activity." Source: G20/OECD. 2012. Disaster Risk Assessment and Risk Financing: A G20/OECD methodological framework.

[45] Risk transfer tools are a means to reduce the potentially crippling financial consequences of disasters and to ensure rapid recovery. Source: G20/OECD. 2012. Disaster Risk Assessment and Risk Financing: A G20/OECD methodological framework.

country to fund climate-induced DRM interventions including flood protection, response to disasters and reconstruction following climate-related hazards such as floods; and ii) increase the financial resources allocated to climate-induced DRM-related activities in Mali. This will be supported by developing and implementing a suite of complementary interventions as described below.

70. The LDCF-financed project will strengthen the technical capacity of national, regional and local government authorities to develop and implement climate-induced DRM strategies and interventions in response to the current and predicted effects of climate change, particularly floods. Capacity-building will be undertaken within the DGPC and decentralised government authorities in circles and communes. The project's capacity-building activities targeted at the aforementioned authorities will include increasing the technical understanding of climate change, climate variability and climate-related hazards among staff. Through the enhanced technical capacity supported by the project, decision-making processes relating to DRM will be informed by climate-related risks, the vulnerabilities of communities and their adaptive capacities. The technical capacity of government authorities will improve the planning and implementation of DRM-related activities throughout the country. Consequently, the vulnerability of Malians to floods will decrease.

Output 2.1: Commune-specific Flood Risk Reduction Plans (FRRPs) with locally-appropriate strategies and interventions to decrease the vulnerability of local communities to floods are developed.

71. Under this output, FRRPs will be developed for the LDCF intervention sites in Bamako, Kayes and Mopti, in consultation with local communities. In particular, flood risk reduction strategies that are cost-effective and suitable to the Malian context will be developed. The FRRPs will therefore include a suite of cost-effective soft and hard interventions to decrease the vulnerability of the local communities. These plans will also provide the associated indicative costs of the flood risk reduction interventions. To effectively implement these plans, municipal and village authorities, the DGPC, AEDD, DNPD and the ENI-ABT will be trained. Under this output, simple technical guidelines will also be compiled and disseminated to the municipal and village authorities beyond the interventions sites so that these interventions can be replicated.

72. These plans will provide a framework to coordinate activities related to flood risk reduction and will include detailed descriptions of locally-appropriate interventions to effectively reduce the vulnerability of communities in the interventions sites to floods. These interventions will be based on the underlying causes of the vulnerability of local communities as determined under Activity 1.3.4. The FRRPs will provide detailed strategies to respond to floods – including *inter alia* the establishment of flood reduction measures such as protective barriers – based on the flood risk maps and index. However no resettlement of vulnerable communities will be supported by this LDCF-financed project. Based on the flood risk maps and index produced, national or local authorities may select to resettle vulnerable communities, however, no LDCF resources will be allocated for such activities.

73. To support the increased effectiveness of DRM planning, the plans under this output will be developed in collaboration with a diverse range of participating stakeholders including: i) local communities at Bamako, Kayes and Mopti; ii) regional and local government authorities; and iii) technical government departments related to hydrology, meteorology, rural development, forestry and civil protection. The participation of local communities will promote the adoption of locally-appropriate measures, including traditional methods for flood protection and flood management, and will facilitate a long-term sense of ownership of the project's activities by participating communities. Through the process of engaging local communities in the project's activities, the participation of women will be prioritised wherever possible. This will promote the consideration of gender equality in the design of the FRRPs.

74. The overarching objective of the FRRPs is to promote effective DRM before, during and after floods. To support effective DRM in Bamako, Kayes and Mopti, a clear organisational structure will be established, including the allocation of responsibilities between national, regional and local authorities. The development of the FRRPs will include the consideration of updated weather-related data generated by the hydro-meteorological network, to be strengthened under Component 1 of the LDCF-financed

project. Furthermore, the FRRPs will be periodically reviewed and updated – if necessary – to include newly updated information.

75. In addition to the development of FRRPs under this output, LDCF resources will be used to improve the solid waste removal practices in Bamako. Firstly, the existing waste transit depots in Bamako will be reinforced through fencing to prevent the establishment of settlements and the over-spilling of solid waste onto surrounding areas. Secondly, an assessment of the solid waste management and removal practices – including the current operation mode of waste transit depots in Bamako – will be undertaken. The assessment will focus on the practices implemented by local government authorities and by local communities. The findings of this assessment will facilitate the identification of gaps and opportunities in the system. Consequently, a long-term solid waste management plan for the effective removal and processing of solid waste will be developed in collaboration with local government authorities in Bamako. In addition to the local government authorities, the DGPC, AEDD, DNPD and ENI-ABT will be consulted in the development of the long-term solid waste management plan for Bamako. The government authorities mentioned above and the DGCT will be consulted to develop a long-term financing strategy to support the implementation of the solid waste management plan.

Indicative activities under Output 2.1 include:

2.1.1. Conduct a technical assessment of the existing stormwater drainage systems in the selected communes.

2.1.2. Develop commune-specific FRRPs in a participatory manner with local communities. These plans will provide a roadmap to local authorities for the development of best-practice soft and hard adaptation interventions to reduce flood risks.

2.1.3. Improve solid waste management in Bamako by: i) undertaking an assessment of the current waste removal and management systems to identify gaps; ii) reinforcing the fencing around existing waste transit depots; and iii) undertaking awareness-raising campaigns with local communities on adopting appropriate waste disposal practices to reduce flood risks.

2.1.4. Integrate short- to medium-term flood risks into the existing Economic, Social and Cultural Development Programme (PDESC) for the selected communes.

Output 2.2: Design, harmonise and enhance existing building and settlement codes to decrease vulnerability of local communities to floods.

76. The LDCF-financed project will revise and strengthen existing building and settlement codes by including considerations related to the management and avoidance of short- to medium-term flood risks. Building codes provide the regulations for the construction of buildings and other infrastructure, and settlement codes specify the location of human settlements. In Mali, settlement codes determine land-use plans, which act as development planning tools by the DNPD, DNUH as well as municipal and village authorities. The revised settlement code will restrict development in flood-prone areas in the intervention sites.

77. To revise the existing building and settlement codes in Mali, an assessment of these documents will be undertaken to determine entry points for flood considerations. As a result of this assessment, the necessary revisions will be proposed to the existing building and settlement codes and submitted for approval during the project's lifespan. The land-use plans associated with settlement codes will also be amended and integrated into the PDESC of Bamako, Kayes and Mopti. If deemed necessary by means of the assessment mentioned above, new building and settlement codes will be proposed for the intervention sites. Policy briefs detailing the proposed revisions to the existing building and settlement codes will be compiled and disseminated to the relevant national and local authorities. The DGPC, DNPD, DNUH, AEDD, DGCT, DNAT, as well as municipal and village authorities, will be trained on the proposed revisions made to the codes mentioned above and on their implementation on the ground.

78. The adoption of improved building and settlement codes will support flood-resilient development and reduce the flood-related risk of future loss of lives and damage to infrastructure. The integration of the revised land-use plans into the PDESC will strengthen them as development planning tools. The revisions to building codes – combined with the development of FRRPs under Output 2.1 – will

significantly decrease the vulnerability of local communities in Bamako, Kayes and Mopti to current and predicted flood risks.

Indicative activities under Output 2.2 include:

2.2.1. Assess and propose revisions to strengthen existing building, and settlement codes and the associated land-use plans by integrating considerations relating to flood risks into them.

2.2.2. Develop policy briefs to detail the proposed revisions and submit the revised documents for approval. If necessary, develop new building and settlement codes for the intervention sites. Integrate the revised land-use plans into the existing PDESC.

Output 2.3: Financial strategies are developed and implemented to improve the financial capacity of local authorities to respond timely to climate-related hazards, in particular floods.

79. Under this output, an economic impact analysis will be undertaken to assess the financial capacity of local government authorities engaging in risk financing, which will improve their financial resilience to disasters. The analysis will also identify opportunities for comprehensive financial protection strategies for local government authorities and public-private partnerships to undertake risk financing in the Malian context. The results of this analysis will inform improved decision-making in the management of financial resources targeted to addressing climate-related hazards.

80. This output of the LDCF-financed project will also promote the development and implementation of sustainable financial strategies to improve the management of risks related to climate-related hazards, such as floods. These strategies will be developed based on assessment of the current financing mechanism used by local government authorities to fund disaster relief in Mali. The development and implementation of these strategies will increase the capacity of the MoF and other local financing institutions to effectively contribute to DRM planning and implementation, primarily by increasing the availability of funds for emergency relief efforts in the event of disasters. Through the development of these financial strategies – in collaboration with the MoF, DGCP and DGCT – national and local authorities will have increased availability of funds to support immediate responses to climate-related hazards and natural disasters, such as floods. Funds will also be made available for activities such as emergency response, targeted financial assistance for vulnerable communities, as well as the reconstruction of public assets and infrastructure.

81. Local government authorities – including the MoF, DGPC and the DGCT – will be trained on the financial strategies developed and implemented through the LDCF-financed project. In particular, they will be trained on accessing funds in the event of climate-related hazards and natural disasters. In addition, training workshops will be held with the government authorities mentioned above on the effective management of these funds for disaster relief and to support the prioritisation of finances to those affected by climate-related hazards and natural disasters.

Indicative activities under Output 2.3 include:

2.3.1. Undertake an economic impact analysis to assess risk financing in the Malian context and the financial capacity of the local government authorities within the intervention sites.

2.3.2. Develop and implement rapid commune-specific financial strategies to facilitate assistance to local communities affected by climate-related hazards, in particular floods, and for the reconstruction of public infrastructure.

Output 2.4: The technical capacity of the relevant national and local authorities on climate risk management planning as well as flood prevention and reduction measures is enhanced.

82. Under this output, the technical staff of relevant national government authorities – including i*nter alia* the DGPC, Mali-Météo, DNH, and the AEDD – and decentralised government authorities in circles and communes as well as the ENI-ABT will be provided with training on forecasting and predicting climate-related hazards. The training held under this output of the LDCF-financed project will promote increased accuracy and effectiveness of forecasting climate-related hazards, such as floods, in other outputs of the project. These training activities will be guided by: i) the application of updated climate and weather data

information generated by the national hydro-meteorological network, enhanced under Component 1; and ii) information generated by the flood risk mapping under Output 1.3. The training will also focus on increasing the effectiveness of DRM interventions currently implemented by GoM, with a particular focus on flood protection and flood management. Training will include methods to develop and implement effective flood prevention interventions in consideration of the predicted increased frequency and severity of climate--related hazards such as floods.

Indicative activity under Output 2.4 include:

2.4.1. Provide training to the relevant national and local government officials within the targeted communes on climate risk management, preventing and minimising the negative effects of climate-related hazards, in particular floods, on vulnerable local communities.

COMPONENT 3: CLIMATE-RESILIENT INVESTMENT TO REDUCE RISKS OF HIGHLY EXPOSED COMMUNITIES.

OUTCOME 3: Climate-resilient flood risk management and reduction techniques transferred to local communities within the targeted communes to decrease their vulnerability.

Co-financing amounts for Outcome 3: US$ 17,656,417
LDCF project grant requested: US$ 3,851,000

Without LDCF Intervention (baseline):

Limited technical capacity and tools to manage floods

83. Historically, Mali has been affected by droughts and locust invasion hazards, and these events have largely been the focus of DRM interventions in the country. These interventions include *inter alia* the generation of climate information and EWSs to detect, predict, monitor and assess droughts and locust invasions. To strengthen the capacity of the GoM to develop and implement DRM interventions in the country, several initiatives have been established. For example, PRECARIA – a partnership between the GoM, UNDP and the Danish Cooperation – was initiated in 2009 to enhance the capacity of the government to assess natural disaster risk at the community level. In addition to PRECARIA, a UNDP/GEF project entitled “Enhancing national disaster and emergency preparedness, response, and recovery capacity in Mali through a disaster reduction advisor” was implemented to strengthen the capacity of the government to mainstream climate risks in local development plans targeting rural communities.

84. In 2012, a cross-sectoral capacity assessment of existing systems, policies and programs relating to DRR was undertaken under by UNDP, UN Office for the Coordination of Humanitarian Affairs (UN-OCHA), United Nations Children’s Fund (UNICEF), World Food Programme (WFP) and Food and Agriculture Organisation (FAO). This assessment resulted in the formulation of a plan to address challenges faced by Mali, including *inter alia* flood risk, food insecurity and locust infestation. Despite the aforementioned initiatives, the DGPC, DNH, and the AEDD have limited technical capacity to manage flood risks and hazards. This is a result of the considerable gaps in flood risk assessment, monitoring and mapping in the country. For example, there is limited understanding of the vulnerability and the level of exposure of local communities and infrastructure to floods, as well as the potential socio-economic damage and losses, in Mali. Consequently, these gaps hamper the capacity of the GoM to effectively plan and implement DRM interventions.

85. The GoM developed a disaster response tool, namely ORSEC, which is a relief plan to be implemented at the national, district, circle and community levels. However, ORSEC primarily addresses drought risks, with limited information provided on long-term flood risk reduction. Consequently, decision-makers within the relevant government institutions, especially at the district, circle and commune levels, have limited information available to effectively plan and implement interventions to reduce flood risks.

86. The traditional flood management measures used in the country include *inter alia* dykes. There are predominantly three types of dykes used, namely: i) traditional dykes without intake or outtake structure; ii) traditional dykes with intake or outtake structure; and iii) large dykes. Traditional dykes without intake or outtake structure are used to protect low-lying areas and are generally destroyed to evacuate water following recession of flood waters. Dykes with intake and outtake structures are generally used to protect flood plains. Large dykes differ from the other two types as they are used to protect large areas, such as agricultural lands and urban areas[46]. Beyond these traditional measures, there is no other flood management infrastructure in the country.

Poor stormwater drainage systems in place

87. In Mali, the majority of peri-urban and rural areas do not have stormwater drainage systems in place[47]. Where there are present, stormwater is managed through a drainage system consisting of canals, open drains and retention ponds. However, inadequate land-use planning and management has led to many areas dedicated to stormwater management becoming inhabited, resulting in stormwater drainage system being used for solid waste, industrial waste and sewage disposal[48]. These ongoing practices block waterways causing: i) water stagnation, which promotes the breeding of disease vectors such as mosquitoes; ii) degradation of the stormwater drainage system; and iii) floods[49]. As a result of poor maintenance systems, stormwater drains are usually only maintained just before the beginning of the rainy season, which leads to the degradation of the components of the stormwater drainage system.

With LDCF Intervention (adaptation alternative)

88. LDCF finances will be used to transfer flood-resilient practices to national, sub-national and local communities within the intervention sites. To manage flood risks, these practices will comprise both soft and hard interventions to decrease the exposure of local communities to floods. This will provide the DGPC, DNM, and sub-national authorities with enhanced technical capacity to develop and implement flood risk reduction measures to decrease the vulnerability of local communities to floods. Local communities will also be trained on flood risks, as well as the operation and maintenance of the interventions implemented under this Outcome.

89. Increased migration of Mali's population from the north to the south of the country has resulted in many people settling in flood plains formed by river beds and basins, especially in Bamako. It is therefore important to strengthen the resilience of the local communities within flood-prone areas to floods. As vulnerability is a factor of exposure to hazards, LDCF interventions will be implemented to reduce flood risks through interventions that aim to increase water infiltration and decrease soil erosion. To reduce flood risks in the interventions sites in the districts of Bamako, Kayes and Mopti, LDCF finances will be used for revegetation of riparian areas using climate-resilient indigenous species to buffer wetland ecosystems against the negative effects of climate change. The interventions of the project will result in the revegetation of at least 10 km of riparian areas in each of the following communes: I, IV, VI, Tomora, Sébékoro, Pignari Bana and Fatoma. In addition, to prevent floods resulting from the overflowing of waterways after intense rainfalls, a wetland in Pignari Bana – located in the district of Mopti – will be rehabilitated to increase its water holding capacity.

[46] Diarra, S., Kuper, M. & Mahé, G. 2004. Integrated flood management case study – Mali: Flood management – Niger River inland delta. Associated Programme on Flood Management, World Meteorological Organisation, Global Water Partnership, Geneva.
[47] Diarra, S., Kuper, M. & Mahé, G. 2004. Integrated flood management case study – Mali: Flood management – Niger River inland delta. Associated Programme on Flood Management, World Meteorological Organisation, Global Water Partnership, Geneva.
[48] pS-Eau. 2013. Stormwater management in the context of urban areas on developing countries.
[49] Ibid.

90. The interventions mentioned above will be complemented by hard interventions such as the construction of permeable rock dams, as well as extended and rehabilitated stormwater drainage systems. LDCF financed will be used to extend the stormwater drainage system by 5 km in each commune, as well as rehabilitate and maintain existing drains. This improvement of stormwater drains is required particularly in Bamako where intense rainfalls often result in the flooding of low-lying areas. To optimise the stormwater drainage system, a long-term management plan will be developed and implemented within the intervention sites.

Output 3.1: Flood risk reduction interventions are implemented to increase water infiltration and reduce soil erosion.

91. LDCF finances will be used to decrease flood risks by promoting water infiltration and reducing soil erosion in the intervention sites. To do so, the management of riparian areas of wetlands will be undertaken within the intervention sites. This will largely consist of revegetation of riparian areas, and an assessment will be undertaken to: i) determine the status of vegetation in the riparian areas of wetlands in the intervention sites; ii) determine the extent of revegetation required to effectively reduce flood risks in each intervention site; and iii) identify the appropriate plant species with climate-resilient properties to be used in this initiative. This activity will require the establishment of three plant nurseries – one per intervention district – and will involve the training of members of the local communities to undertake revegetation in the riparian areas of wetlands in their respective communities. Approximately 70 km (at least 10 km per commune) of riparian areas of wetlands in the intervention sites will be managed with LDCF resources. Climate-resilient indigenous plant species will be selected based on their soil binding properties and community-based planting will be undertaken.

92. In addition to the management of riparian areas, the wetland in Pignari Bana (Mopti) will be rehabilitated. Based on consultation with local communities, this wetland was identified as requiring expansion to increase its water holding capacity, thereby reducing flood risks. As a response to the needs of the local community in Pignari Bana (Mopti), LDCF resources will be used to double the water holding capacity of the wetland from ~1,000 m^3 to ~2,000 m^3 by increasing its depth by one metre. To determine the viability of increasing the capacity of this wetland, a feasibility assessment will be undertaken. Moreover, an Environmental Impact Assessment (EIA) will be undertaken to determine the impact of deepening of the wetland on water quality and aquatic life. The rehabilitation of the wetland will be managed in line with the recommendations of the EIA and corrective actions where required.

93. Commune IV in Bamako is surrounded on its western border by Mount Madingues. Local communities located at the bottom of the Mount are flooded regularly as a result of surface runoff following intense rains. To protect these local communities located in flood-prone areas, a network of canals will be created to divert surface runoff into wetlands in Wowowowanko, Farako and Diafaranako, thereby preventing water runoff from reaching local communities situated at the bottom of the slopes of Mount Madingues in commune IV in Bamako. The network of canals will be designed in collaboration with municipal and village authorities, as well as the DNH, the DGPC and ENI-ABT. A feasibility assessment will be undertaken in collaboration with ENI-ABT to determine the viability of the design of the network of canals and the capacity of the wetlands in Wowowowanko, Farako and Diafaranako to hold additional water runoff. The feasibility assessment will also ensure that the network of canals will be designed to reduce current and future flood risks under the predicted conditions of climate change as determined by the downscaled information generated in Output 1.3. An EIA will also be undertaken to determine; i) any potential impacts of the construction and operation of the network of canals on the environment; and ii) the impact on aquatic life as a result of increased runoff in the wetlands in Wowowowanko, Farako and Diafaranako. If required, the design of the network of canals will be amended to conform to the recommendation of the EIA.

94. A long-term maintenance plan will be developed and implemented to ensure the sustainability of the network beyond the project's lifespan. Training on the long-term maintenance plan will be provided to: i) government authorities including the DNH, DGPC, and municipal and village authorities; ii) representatives from ENI-ABT; iii) NGOs; and iv) CSOs. This plan will be detail the role of each

stakeholder involved in maintaining the network of canals, their respective responsibilities and allocated timeframes to undertake their tasks.

Indicative activities under Output 3.1 include:

3.1.1. Rehabilitate the wetland in Pignari Bana to increase its water holding capacity.

3.1.2. Rehabilitate at least 10 km of riparian areas of wetlands with climate-resilient indigenous plant species in each of the seven communes selected for LDCF intervention (70 km in total).

3.1.3. Develop a network of canals to channel water runoff from Mount Madingues in commune IV in Bamako into wetlands located in Wowowowanko, Farako and Diafaranako.

Output 3.2: Flood risk reduction interventions are implemented to reduce the vulnerability of human lives and infrastructure.

95. Hard interventions such as permeable rock dams and stormwater drains will be constructed to decrease the vulnerability of local communities to floods, thereby securing their lives, livelihoods and protecting current and future infrastructure. Permeable rock dams are low rock walls spread over a long distance that cause runoff to spread from a waterway. This technique reduces the velocity and the erosive potential of floodwaters while enhancing groundwater recharge within the enclosed area. The spreading of floodwaters causes siltation of fertile deposits which promotes increased crop production after the water has receded. This intervention will require a feasibility assessment to determine the appropriate location of these permeable rock dams to maximise their efficiency in the long-term, thereby decreasing the vulnerability of local communities to floods, in the context of the expected climate change.

96. Technical guidelines will be produced on the purpose of these rock dams and disseminated to other municipal and village authorities. In addition, training of the technical staff of the DNH, DGPC, and municipal and village authorities, as well as members of local communities, will be held on maintaining the network of canals to ensure their effectiveness as per the long-term maintenance plan developed and implemented for the permeable rock dams, financed by the LDCF. This plan will detail the role of each stakeholder involved in maintaining the permeable rock dam, their respective responsibilities and allocated timeframes to undertake their tasks. The development and implementation of this plan will occur during the project's lifespan.

97. As functioning stormwater systems reduce flood risks, LDCF finances will be used to extend, rehabilitate and maintain the existing systems in the communes I, IV, VI, Sébékoro and Fatoma. The system in each of the above mentioned communes will be extended by 5 km to improve stormwater reticulation, thereby reducing flood risks. A feasibility assessment will be undertaken to determine the best location for the construction of the drains based on the maps generated under Activity 2.1.2. These maps will also be used to determine the priority areas in which drains need to be rehabilitated and maintained for optimum operation. Following the identification of the priority areas, rehabilitation and maintenance of the existing stormwater drainage systems will be undertaken. To ensure the long-term viability of the systems, commune-specific long-term maintenance plans will be developed and implemented. These plans will be developed in collaboration with local communities and sub-national government authorities and will formalise partnerships between the relevant stakeholders. These partnerships will promote the ongoing maintenance of stormwater drainage systems. Similarly to the long-term maintenance plan for the permeable rock dams discussed in this output, this plan will detail the role of each stakeholder involved in maintaining the canals, their respective responsibilities and allocated timeframes to undertake their tasks.

Indicative activities under Output 3.2 include:

3.2.1. Undertake a feasibility assessment for the construction of permeable rock dams in the intervention sites.

3.2.2. Undertake a feasibility assessment for the construction of 25 kilometres of stormwater drains. This activity will be based on Output 2.1. and will include the construction of five kilometres of stormwater drains in communes I, IV, VI, Sébékoro and Fatoma.

3.2.3. Clean and maintain existing stormwater drains in the targeted communes.

Stakeholder involvement plan

98. The implementation strategy for the LDCF-financed project includes extensive stakeholder participation. Details of the stakeholder participation during the PPG phase are provided in Section II. Table 2 below proposes a stakeholder involvement plan for the implementation phase. This will be further developed and validated during the project inception workshop.

Table 2: Relevant stakeholders identified for engagement by project output.

Outcome	Output	Stakeholder	Key responsibilities
Outcome 1: Strengthened technical capacity of municipal and village authorities to improve flood early warning systems and dissemination of climate-related risk information.	**Output 1.1.** A sound climate information system comprising devices operating 24 hours a day to monitor and forecast flood risks and hazards is established.	Mali-Météo; DNH; DGPC; AEDD; Municipal and village authorities; and ENI-ABT.	Install new and rehabilitate existing meteorological and hydrological stations. Monitor climate-related information. Develop meteorological services.
	Output 1.2. Early warning and quick-response systems are developed to increase the resilience of vulnerable local communities in the intervention sites.	DGPC; Mali-Météo; DNH; Municipal and village authorities; DNUH; and ENI-ABT.	Implement a flood EWS in the intervention sites. Develop and disseminate a plan for the communication of flood risks and hazards. Develop commune-specific responses such as evacuation plans.
	Output 1.3. Flood risk mapping combining risks with socio-economic indicators – including inter alia population size, land value, land uses, assets – is undertaken.	DGPC; DNPD; DNH; AEDD; Mali-Météo; ENI-ABT; DGCT; Other line ministries; and Municipal and village authorities.	Use climate models to determine short- to medium-term climate risks, particularly for floods. Collect and analyse socio-economic data in the communities selected for LDCF interventions. Undertake flood risk mapping by combining flood risks and socio-economic data in the intervention sites.
	Output 1.4. An awareness-raising campaign is undertaken within local communities and schools to build a culture of safety and resilience to floods.	DGPC; Ministry of Education; and Municipal and village authorities.	Conduct awareness-raising campaigns in schools on the impact of floods and decreasing climate risks. Provide training workshops to members of local communities on decreasing their vulnerability to floods. Use other means of communication and platforms to raise awareness of local communities to floods.

Outcome 2: Effective flood risk management mainstreamed into the relevant development planning policies and budgetary processes to increase the resilience of local communities.	**Output 2.1.** Commune-specific Flood Risk Reduction Plans (FRRP) with locally-appropriate strategies and interventions to decrease the vulnerability of local communities to floods are developed.	Municipal and village authorities; DGPC; AEDD; DNPD; ENI-ABT; and DGCT.	Propose the necessary revisions to the Economic, Social and Cultural Development Programme (PDESC) to incorporate short- to medium-term flood risks. Undertake a technical assessment of the existing stormwater drainage system. Conduct awareness-raising campaigns on appropriate waste disposal and sanitation methods. Secure and manage waste transit depots to improve solid waste management in Bamako.
	Output 2.2. Design, harmonize and enhance existing building and settlement codes to decrease vulnerability of local communities to floods.	DGPC; DNPD; AEDD; DNUH; Mali-Météo; DGCT; DNAT; and Municipal and village authorities.	Evaluate the existing building codes in the selected communes. Determine entry points to strengthen the building codes by mainstreaming climate considerations into them. Propose revisions to existing building codes to prevent flood-related damages.
	Output 2.3. Financial strategies are developed and implemented to improve the financial capacity of local authorities to respond timely to climate-related hazards, in particular floods.	MoF; DGPC; DGCT; ENI-ABT; DGCT; and Municipal and village authorities.	Assess the current financing mechanism used for disaster relief. Develop and implement financing strategies.
	Output 2.4. The technical capacity of the relevant national and local authorities on climate risk management planning as well as flood prevention and reduction measures is enhanced.	AEDD; DGPC; ENI-ABT; DGCT; Mali-Météo; DNH; and Municipal and village authorities.	Targeted training on planning, developing and implementing risk reduction measures.
Outcome 3: Climate-resilient	**Output 3.1.** Flood risk reduction	DGPC;	Rehabilitate and increase the

flood risk management and reduction techniques transferred to local communities within the targeted communes to decrease their vulnerability.	interventions are implemented to increase water infiltration and reduce soil erosion.	DNH; DNACPN; NGOs; ENI-ABT; CSOs; and Municipal and village authorities.	water holding capacity of an existing wetland in Pignari Bana. Revegetation of riparian areas with climate-resilient indigenous species.
	Output 3.2. Flood risk reduction interventions are implemented to reduce the vulnerability of human lives and infrastructure.	DGPC; DNH; ENI-ABT; NGOs; CSOs; and Municipal and village authorities.	Extend the existing stormwater drainage system. Improve the existing stormwater drainage system by cleaning and maintaining the drains.

IV. FEASIBILITY

Cost-effectiveness

99. The activities of LDCF-financed project have been designed to balance considerations of cost-effectiveness and efficient use of LDCF resources against the urgent objectives related to minimising the impacts of floods. Such activities include *inter alia*: i) the development of an EWS to disseminate early warnings to vulnerable communities; ii) an analysis of flood risks to determine the vulnerability of a particular site based on socio-economic factors, risk of exposure and capacities of local communities; iii) the development of site-specific plans containing locally-appropriate flood reduction interventions to protect communities; and iv) the implementation of flood reduction interventions in pilot sites in Bamako, Kayes and Mopti such as permeable rock dams. In line with LDCF principles of additionality, the project will pursue partnerships with ongoing initiatives in the country, to reduce operational costs and minimise the risk of duplication of activities. The project will prioritise these partnerships and collaborative relationships as opportunities to build on lessons learned and best practices established by past projects.

100. LDCF investments in enhanced preparedness and protection against floods are likely to be inherently cost-effective compared to the costs of flood-induced damage. In particular, floods are responsible for 98.3% of disaster-induced mortality and 98.5% of disaster-induced economic losses in the country[50]. These hazards cause an Average Annual Loss of ~US$ 45,000,000[51]. In addition, each flood event in the last 30 years has affected between 10,000 and 45,000 people in Mali. For example, the flood events in 2010 resulted in 111 deaths, 6,052 houses destroyed, 12,000 hectares of agricultural land flooded, and the widespread destruction of infrastructure such as bridges and roads[52]. Measures can be taken to avoid this extensive damage. For example, investing a total of US$ 8,950,000 in climate information, an EWS and flood protection will significantly reduce the vulnerability to floods of infrastructure, assets and livelihoods of 120,000 households.

Cost-effectiveness of flood risk reduction

101. LDCF-financed alternative: The LDCF-financed project will deliver training and capacity-building activities, which are largely focused on disaster preparedness and prevention, rather than disaster response and recovery. This approach will entail the implementation of flood protection interventions in

[50] Prevention web. Mali: Disaster and risk profile. 2014. Source: http://www.preventionweb.net/countries/mli/data/.
[51] Ibid.
[52] Government of Mali. 2012. Plan National Multi Risques de Préparation et de Réponse aux Catastrophes.

pilot sites in Bamako, Kayes and Mopti. Flood risk management is a widely used approach to minimise damage caused by flood waters that is supported by a well-established evidence base detailing its cost-effectiveness and benefits. For example, a cost-benefit analysis of protection against floods in Europe was conducted in 2013 and suggested that in the absence of additional investments in flood protection, annual damages resulting from floods would increase from ~US$ 6.2 billion per year – present costs – to ~US$ 110 billion per year by 2080[53]. In comparison, an 'intermediate' investment scenario found that moderate investments in disaster risk reduction would result in a total saving – including damage prevented as well as benefits generated – of up to ~US$ 60 billion per year by 2080[54].

102. Other alternative: Resettlement. An effective way of reducing flood risks would be to resettle vulnerable local communities – as identified in the flood risk analysis under Output 1.3. The resettlement of these communities to flood-protected areas would inevitably decrease their vulnerability to this particular climate-related hazard. However, resettlement is a capital-intensive and complicated process with major socio-economic consequences – requiring lengthy GoM's procedures and relocation sites' selection processes. In the interim, the vulnerable local communities in the intervention districts of Bamako, Kayes and Mopti would remain exposed to floods.

103. To enable resettlement, the GoM in collaboration with the DGPC, DNUH and DNPD would have to provide houses to the local communities currently located in flood-prone areas. This is a capital-intensive[55] process as every single household identified for resettlement would have to be provided with a house of commensurate value in a location that is not prone to floods. Additionally, local communities would be removed from their sources of livelihoods which may lead to immediate impoverishment until alternative livelihoods can be adopted. Increased poverty would raise several risks – including poor health – for the relocated communities. In addition, resettlement is a disruptive practice as it can *inter alia* break social networks and lead to decreased access to basic services[56].

104. The costs of resettlement exceed those associated with implementing flood management and protection interventions. In addition, this disruptive practice could lead to socio-political conflicts. Therefore, resettlement should only be considered after all other prevention and adaptation options have been exhausted.

Cost-effectiveness of climate information and EWS

105. LDCF-financed alternative: The LDCF-financed project will design and implement three EWSs – one in each intervention district – covering ~120,000 households. The guiding principles in the development of the EWSs include: i) affordability; ii) simplicity of technology to reduce maintenance requirements; and iii) sustainability, which relates to the ability of the relevant government authorities to cover the long-term running costs without requiring external support. The cost-effectiveness of investments to improve the effectiveness of an EWS can be challenging to quantify and as result there are relatively few cost-benefit analyses of such investments[57]. However, a growing body of literature indicates that investments in EWS for disaster prevention are more cost-effective than disaster response[58]. For example, it is estimated that if the climate information and EWS in developing countries were upgraded to the level equivalent to that of developed countries, the total saving – in avoided loss of assets – would amount to between ~US$ 300 million and US$ 2 billion per year. Furthermore, the total potential global benefits to be realised through investments in improvement of climate information and EWS are estimated at US$ 4 billion to US$ 36

[53] Rojas, R. et al. 2013. Climate change and river floods in the European Union: Socio-economic consequences and the costs and benefits of adaptation. Global Environmental Change.
[54] Rojas, R. et al. 2013. Climate change and river floods in the European Union: Socio-economic consequences and the costs and benefits of adaptation. Global Environmental Change.
[55] Ibrahim, I. et al. 2015. Suitability Analysis of Resettlement Sites for Flood Disaster Victims in Lokoja and Environs. World Environment. 5(3): 101-111.
[56] Ibid.
[57] Tsirkunov, V. and Rogers, D. 2010. Costs and benefits of early warning systems. Global Assessment report on Disaster Risk Reduction. The World Bank.
[58] Healy, A. and Malhotra, N. 2009. Myopic Voters and Natural Disaster Policy. *The American Political Science Review* 103(3): 387-406.

billion per year, which significantly outweighs the cost of investments of US$ 1 billion per year. The benefit-cost ratio for developing countries to invest in climate services and EWS is therefore between 4 and 36[59]. In addition, there are indirect economic benefits[60] from an improved EWS, estimated at between US$ 3 billion and US$ 30 billion per year[61]. In West Africa, a quantitative comparison between the costs of flood response alone (for 2006 and 2007) and the cost of flood response with Early Warning-Early Action (2008) showed that effective communication of early warnings resulted in ~30% lower cost per beneficiary[62].

106.Resettlement alternative: With this alternative, the quality and quantity of weather-related data generated by Mali-Météo and their expertise to interpret these data would not be enhanced. Consequently, the forecast of imminent floods or other climate-related hazards by Mali-Météo would be *ad hoc* and unreliable. The GoM would therefore have the capacity to implement disaster response over disaster prevention with resettlement – which is a capital-intensive process – remaining as the only option for disaster prevention in Bamako, Kayes and Mopti.

Risk management

Table 3: Risk management table.

Project risks					
Description	**Type**	**Impact & Probability**	**Mitigation measures**	**Owner**	**Status**
Unclear distribution of the roles for the maintenance of meteorological and hydrological stations, pluviographs, network of canals to divert water, permeable rock dams, and stormwater drains.	Operational	P= 3 I= 3	- Simple technical guidelines on operation and maintenance will be compiled by the relevant specialist and/or supplier. - Training workshops on the operation and maintenance of equipment, stations and systems implemented under the LDCF-financed project. - Long-term maintenance plans including identification of stakeholder roles and funding sources will be developed for meteorological and hydrological stations, pluviographs, network of canals to divert water, permeable rock dams, and stormwater drains implemented under this project to promote their maintenance and/or management by the relevant authorities beyond the project lifespan.	AEDD	no change
Insufficient support from the	Organisational	P= 2	- The LDCF-financed interventions were developed through multiple stakeholder	AEDD DGPC	increasing

[59] Hallegatte, S. 2012. A cost effective solution to reduce disaster losses in developing countries. Policy Research Working Paper 6058. The World Bank.
[60] The indirect economic costs referred to are long-lasting trauma and post-disaster evacuation costs. Source: Balbi, S. et al. 2014. Estimating the Benefits of Early Warning Systems in Reducing Urban Flood Risk to People: A Spatially Explicit Bayesian Model (May 26, 2014). 2014 Proceedings of the 7th International Congress on Environmental Modelling and Software, San Diego, USA.
[61] Hallegatte, S. 2012. A cost effective solution to reduce disaster losses in developing countries. Policy Research Working Paper 6058. The World Bank.
[62] L. Braman. 2009. Early warning, early action: an evaluation of IFRC West and Central Africa zone flood preparedness and response. International Federation of the Red Cross and Red Crescent Societies (IFRC) Report 56.

beneficiary communities to implement the project successfully as benefits are not apparent immediately and only become evident in the event of floods.		I= 4	consultations with local communities in November 2015. - Extensive engagement of local communities in decision making will be pursued throughout the implementation phase. - Where possible, local labour will be sourced to increase their support. - Tangible and visible activities that addressed community priorities will be implemented early during the project implementation phase. - The Technical Assistants appointed as part of the Project Management Unit in each site will maintain strong communication link with the project beneficiaries, manage expectations of local communities, and ensure alignment of project results, targets and benefits with communities' needs.		
Limited coordination among government authorities.	Operational & Strategic	P= 2 I= 4	- The project will be implemented according to management arrangements as described in Section VII of this Project Document. The project management arrangement as currently established promote coordination of government authorities – including *inter alia* the DGPC, Mali-Météo, DNH, DGCT, and municipal and village authorities – on the Project Board. The chair of the Project Board, the CNCC, will intervene and implement the remedial actions if limited coordination among government authorities hinder the progress of the LDCF-financed project.	AEDD	Decreasing
Inadequate coordination between national and local (communal, municipal and village) authorities.	Operational & Strategic	P= 2 I= 3	- Among the roles of the Project Coordinating Unit (see Section VII of this Project Document), it is clearly stated that it is responsible for the coordination between national government departments and decentralised institutions such as communal, municipal and village authorities. - Representatives of national and local authorities will participate in the Project Management Unit meetings which will be used as a platform to ensure sufficient communication between and within institutions.	AEDD	Decreasing
Project interventions are not gender-sensitive and gender-	Strategic	P= 1 I= 3	- Ensure that the project team is familiar with the gender mainstreaming manual developed by UNDP. - Promote the inclusion of women groups in the Project Board to support	AEDD	Decreasing

responsive.			the implementation of the project activities in a gender-sensitive manner. - The inclusion of gender-sensitive indicators in the results framework promotes gender considerations in the development and implementation of LDFC-financed interventions (see Section II of this Project Document).		
Insufficient political and financial support from the GoM.	Political	P= 1 I= 3	- The LDCF-financed project is country-driven and was developed based on the consultations of government departments. - Reducing vulnerability to floods to secure lives and assets in Mali is a priority of the GoM.	AEDD MoF DGCT	No change
Interventions in the district of Mopti are delayed by ongoing conflicts.	Political	P= 1 I= 3	- Although there have been a few incidents with insurgent groups in Mopti over the last year, the majority of conflicts occur in the northern parts of the country. The Technical Assistant based in Mopti will monitor the local situation and report to the Project Coordinator and the Project Board to determine if LDCF-financed interventions needs to be amended for security reasons.	AEDD DGPC	Increasing
Climate hazards delay the implementation of project interventions.	Environm ental	P= 2 I= 4	- Project activities that are particularly sensitive to climate conditions such as the construction of hard infrastructure will be carefully scheduled taking into account rainfall partners and forecast. This will include collaboration with Mali-Météo.	Mali-Météo DNH AEDD DGPC	Increasing

Environmental and social safeguards

107. The UNDP environmental and social safeguards requirements have been followed in the development of this LDCF-financed project. As outlined below, the project is not expected to have any negative environment or social impacts.

108. The project will decrease the vulnerability of the communities to floods through improved management of rainwater. The most vulnerable sites will be selected for the construction of hard interventions and implementation of revegetation interventions through a participatory process. The members of targeted vulnerable communities will therefore benefit equally from these interventions. As a result, no conflicts within the communities are expected as a result of the project interventions. Furthermore, the hard infrastructures built by the project will be design specifically to protect community lives and assets. Last, improved water management will contribute positively to people's health.

109. The revegetation of wetlands will protect natural resources and livelihoods from the effects of climate change. Solely positive effects on habitat and biodiversity are expected from the revegetation activities. Ecosystem functioning for example will be promoted by the activities as they will focus on soil stabilisation, improve water infiltration and restore natural vegetation. Revegetated land will be less vulnerable to degradation by intense rains. Indigenous species will also be preferred to maximise the positive effects on the environment. Lastly, the increase in biomass resulting from revegetation will contribute to carbon sequestration.

110. Although the project will benefit local communities, it is not expected that this will lead to localised population increases. Rather, it is expected that the interventions such as increased access to climate information will benefit local communities beyond the LDCF intervention sites. Consequently, no population displacement are expected as a direct or indirect result of the project.

111. Gender equality is a focus area of the LDCF-financed project. The project interventions will promote social equity and equality. All social consequences of the project are expected to be positive. Local communities' approval and support of the interventions will be sought prior to implementation. As the LDCF-financed project is expected to have either no effects or positive effects on the environment and community, it is not necessary to undertake a full environmental and social review. However, Environmental Impact Assessment will be conducted prior to the construction of hard infrastructure according to the national EIA legislation or if any potential social or environment risk is identified based on the feasibility assessment study.

V. PROJECT RESULTS FRAMEWORK

Table 4: Results framework.

Intended Outcome as stated in the UNDAF/Country Programme Results and Resources Framework: ***Outcome 2****: Disadvantaged groups, particularly women and young people, benefit from increased capacities and productive opportunities in a healthy and sustainable environment conducive to poverty reduction.*						
Outcome indicators as stated in the Country Programme Results and Resources Framework, including baseline and targets: ***Output 2, Indicator 2:*** *Percentage of vulnerable people pursuing disaster risk and climate-resilient economic activities.* ***Output 3, Indicator 2:*** *Number of disaster risk reduction and sanitation action plans developed at national, regional and local level.*						
Applicable Outputs from the 2014 – 2017 UNDP Strategic Plan: *choose one!* Output 1.4: Scaled up action on climate change adaptation and mitigation cross sectors which is funded and implemented.						
Applicable Output Indicators from the UNDP Strategic Plan Integrated Results and Resources Framework: Output 1.4 indicator 1.4.1: a) Extent to which climate finance is being accessed b) Extent to which there is a system in place to access, deliver, monitor, report on and verify climate finance. Output 1.4 indicator 1.4.2: Extent to which implementation of comprehensive measures – plans, strategies, policies, programmes and budgets – to achieve low-emission and climate-resilient development objectives has improved.						
	Objective and Outcome Indicators	**Baseline**[63]	**Mid-term Target**63	**End of Project Target**63	**Source of verification**	**Assumptions**[64]
Project Objective: **To strengthen the capacity of national and local government authorities to effectively manage the negative effects of floods on local communities and infrastructure in Mali.**	Technical and institutional capacity of municipal and village authorities, Mali-Météo, DNH and DGPC to effectively manage flood risks [adapted from AMAT Indicator 10].	Currently, there is low capacity within national and local government authorities to assess flood risks as well as develop and implement flood risk reduction interventions. Scorecard rating at baseline is estimated at 2.	LDCF-financed interventions are implemented to increase the technical and institutional capacity of municipal and village authorities, Mali-Météo, DNH and DGPC to plan and manage flood risks is increased. Scorecard rating of at least 3.	By the end of the project, municipal and village authorities, Mali-Météo, DNH and DGPC have the technical and institutional capacity to assess flood risks as well as implement risk management and reduction interventions to decrease the vulnerability of local communities at the intervention sites. Scorecard rating of at least 4.	Capacity scorecard assessment of the technical officials within municipal and village authorities, Mali-Météo, DNH and DGPC. The following criteria will be used: 1. Ability to analyse data from weather stations and disseminate flood early warnings to vulnerable communities timely. 2. Capacity to assess flood risks under the predicted conditions of climate change (given the necessary tools such as the flood risk maps). 3. Capacity to develop and effectively implement flood risk management and reduction interventions to decrease the vulnerability of local communities in the intervention sites.	Risk: Insufficient political and financial support from the GoM. Assumption: The GoM has the financial capacity to support the maintenance of the project interventions. Risk: Limited coordination among government authorities. Assumption: Adequate involvement of and coordination between government authorities will enable the maintenance of a good progress rate for the project implementation and promote sustainability.

[63] Baseline, mid-term and end of project levels must be expressed in the same neutral unit of analysis as the corresponding indicator.

[64] Risks must be outlined in the Feasibility section of this project document.

					The scorecard rating is as follows: 1 = No capacity or very limited capacity at the individual level and within the respective government institution. 2 = Partially developed capacity at the individual level. 3 = Partially developed capacity at the individual level and within the respective government institution. 4 = Fully developed and demonstrated capacity at the individual level. 5 = Fully developed and demonstrated capacity at the individual level and within the respective government institution.	
Component 1/ Outcome 1: Strengthened technical capacity of municipal and village authorities to improve flood early warning systems and dissemination of climate-related risk information.	Number of people (% of whom are women) with access to improved flood EWS [adapted from AMAT 8].	Currently, 0 people are covered by the existing EWS system. However, the system is not well developed for rapid-onset events such as floods.	By Mid-Term, at least 600,000 people have access to improved flood EWS in the intervention sites (50% of whom are women).	By the end of the project, 1,200,000 people have access to improved flood EWS (50% of whom are women).	Analysis of maps (at least one per commune) delineating the extent of the flood EWS and the population size covered.	Risk: Inadequate coordination between national and local (communal, municipal and village) authorities. Assumption: Coordination between national and local government will enable successful implementation of the project. Risk: Insufficient political and financial support from the GoM. Assumption: The GoM has the financial capacity to support the maintenance of the project interventions. Risk: Unclear distribution of the roles for the maintenance of meteorological and hydrological stations, pluviographs, network of canals to divert water, permeable rock dams, and stormwater drains. Assumption: The development and implementation of long-term maintenance plans will

						strengthen the technical and financial capacity of the relevant stakeholders to maintain the new equipment.
	Number of monitoring and management committees established (composed of at least 50% women).	There is currently no monitoring and management committee in place to act as an intermediary link between local communities and Mali-Météo for the effective dissemination of climate risk and hazard information.	At least five of the monitoring and management committees established and composed of 50% women.	At least seven monitoring and management committees established (1 per commune), composed of at least 50% women, for the effective dissemination of information on climate risk and hazard between Mali-Météo and the relevant communities.	Review of the official list of committee members which is to be included in the MoU with Mali-Météo.	Risk: Project interventions are not gender-sensitive. Assumption: The participation of women's groups in the design and implementation of the project promotes the distribution of benefits in a gender-sensitive manner.
Component 2/ Outcome 2: Effective flood risk management mainstreamed into the relevant development planning policies and budgetary processes to increase the resilience of local communities.	Number of Economic, Social and Cultural Development Programme (PDESC) revised to include short- to medium-term flood risks [adapted from AMAT 13].	There is currently one PDESC per district and they make little to no mention of flood risks and locally-appropriate reduction measures. At present, there are several incoherent building codes that prescribe different minimum standards for flood-resilient infrastructure.	At least one PDESC revised.	Three PDESC revised (one for each targeted district) to include short- to medium-term flood risks.	Review of the revised PDESC.	Risk: Limited coordination among government authorities. Assumption: Adequate involvement of and coordination between government authorities will enable the maintenance of a good progress rate for the project implementation and promote sustainability Risk: Inadequate coordination between national and local (communal, municipal and village) authorities. Assumption: Coordination between national and local government will enable successful implementation of the project.
	Number of commune-specific Flood Risk Reduction Plans (FRRPs) developed in a participatory	There are currently no commune-specific FRRPs to provide a roadmap to decrease the vulnerability of	At least two FRRPs developed.	At least seven FRRPs (one per selected commune) is developed in a participatory manner. The FRRPs will detail locally-	Review of the FRRPs produced.	*Risk:* Project interventions are not gender-sensitive. *Assumption:* The participation of women's groups in the design and implementation of the project promotes the

	manner with local communities [adapted from AMAT 13].	local communities in the selected communes to floods.		appropriate and cost-effective flood risk reduction interventions to be implemented.		distribution of benefits in a gender-sensitive manner.
Component 3/ Outcome 3: Climate-resilient flood risk management and reduction techniques transferred to local communities within the targeted communes to decrease their vulnerability.	Number of km of stormwater drains constructed and rehabilitated to decreased flood risks [adapted from AMAT 2].	Drains in communes I, IV, VI, Sébékoro and Fatoma and/or the inadequate maintenance of existing ones.	By Mid-Term, at least 10 km of stormwater drain is constructed.	Drains constructed in five of the selected communes and at least 20 km of existing stormwater drains within the selected communes cleaned and rehabilitated to improve water drainage.	Interviews with local communities. Measurement of the length of stormwater drains constructed and rehabilitated. Review of the maintenance systems in place. Review of construction and maintenance progress reports to be provided by the contracted company to the Project Management Unit.	Risk: Unclear distribution of the roles for the maintenance of meteorological and hydrological stations, pluviographs, network of canals to divert water, permeable rock dams, and stormwater drains. Assumption: The development and implementation of long-term maintenance plans will strengthen the technical and financial capacity of the relevant stakeholders to maintain the new equipment. Risk: Insufficient support from the beneficiary communities to implement the project successfully as benefits are not apparent immediately and only become evident in the event of floods. Assumption: Involvement in the design of project interventions and ongoing communication on the expected benefits of the activities for local communities will result in the support of the project by these communities. Risk: Project interventions are not gender-sensitive. Assumption: The participation of women's groups in the design and implementation of the project promotes the distribution of benefits in a gender-sensitive manner.

						Risk: Interventions in the district of Mopti are delayed by ongoing conflicts Assumption: There is no civil unrest in the intervention sites during the implementation of the project. Risk: Climate hazards delay the implementation of project interventions. Assumption: Scheduling of activities based on potential climate risks enables climate-induced delays in the implementation of project interventions to be prevented.
	Number of km of riparian areas revegetated with climate-resilient species.	Approximately 25 km of riparian areas are revegetated.	By Mid-Term, at least 20 additional km of riparian areas are revegetated with climate-resilient species.	At least 35 additional km of riparian areas revegetated with climate-resilient species to increase water infiltration and reduce soil erosion.	Site visits to verify the extent of riparian area revegetated. Review of progress reports on revegetation interventions. Interviews with the relevant implementing organisations.	Risk: Insufficient support from the beneficiary communities to implement the project successfully as benefits are not apparent immediately and only become evident in the event of floods. Assumption: Involvement in the design of project interventions and ongoing communication on the expected benefits of the activities for local communities will result in the support of the project by these communities.

VI. MONITORING AND EVALUATION (M&E) PLAN

111.The project results as outlined in the project results framework will be monitored annually and evaluated periodically during project implementation to ensure the project effectively achieves these results.

112.Project-level monitoring and evaluation will be undertaken in compliance with standard UNDP requirements as outlined in the UNDP POPP and UNDP Evaluation Policy. Though these UNDP requirements are not detailed in this section of the project document, the UNDP Country Office will ensure UNDP M&E requirements are met in a timely fashion and to high quality standards. The additional and mandatory GEF-specific M&E requirements as outlined in this section will be undertaken in accordance with the GEF M&E policy and GEF guidance materials. In addition to these mandatory UNDP and GEF M&E requirements, other M&E activities deemed necessary to support project-level adaptive management, and the exact role of project target groups and other stakeholders in project M&E activities, will be finalised during the Inception Workshop and will be detailed in the Inception Report.

Oversight and monitoring responsibilities:
113.The primary responsibility for daily project implementation and regular monitoring rests with the Project Coordinator. The Project Coordinator will develop annual work plans based on the multi-year work plan included in Appendix 1, including annual targets at the output level to ensure the efficient implementation of the project. The Project Coordinator will ensure that the standard UNDP and GEF M&E requirements are fulfilled to the highest quality. This includes, but is not limited to, ensuring the results framework indicators are monitored annually in time for reporting (i.e. GEF PIR), and reporting to the NSC at least twice a year on project progress. The Project Coordinator will inform the NSC and the UNDP Country Office of any delays or difficulties as they arise during implementation, including the implementation of the M&E plan, so that the appropriate support and corrective measures can be adopted. The Project Coordinator will also ensure that all project staff maintain a high level of transparency, responsibility and accountability in monitoring and reporting project results.

114.The UNDP Country Office will support the Project Coordinator as needed, including through annual supervision missions. The UNDP Country Office is responsible for complying with all UNDP project-level M&E requirements as outlined in the UNDP POPP. This includes ensuring the UNDP Quality Assurance Assessment during implementation is undertaken annually; that annual targets at the output level are developed, and monitored and reported using UNDP corporate systems; and, updating the UNDP gender marker on an annual basis based on progress reported in the GEF PIR and UNDP ROAR reporting. Any quality concerns flagged by the process must be addressed by project management. Additional M&E and implementation quality assurance and troubleshooting support will be provided by the UNDP-GEF Regional Technical Advisor and the UNDP-GEF Unit as needed. The project target groups and stakeholders including the GEF Operational Focal Point will be involved as much as possible in project-level M&E.

115.**Audit Clause**: The project will be audited according to UNDP Financial Regulations and Rules and applicable audit policies.

116.**Additional GEF monitoring and reporting requirements:**
Inception Workshop and Report: A project inception workshop will be held after the project document has been signed by all relevant parties to: i) re-orient project stakeholders to the project strategy and discuss any changes in the overall context that influence project implementation; ii) discuss the roles and responsibilities of the project team, including reporting and communication lines and conflict resolution mechanisms; iii) review the results framework and discuss reporting, monitoring and evaluation roles and responsibilities and finalise the M&E plan; iv) review financial reporting procedures and mandatory requirements, and agree on the arrangements for the annual audit; v) plan and schedule NSC meetings and finalise the first year annual work plan. The Project Coordinator will prepare the inception report no later than two weeks after the inception workshop. The final inception report will be cleared by the UNDP Country Office and the UNDP-GEF Regional Technical Adviser, and will be approved by the NSC.

117.GEF Project Implementation Report (PIR): The Project Coordinator, the UNDP Country Office, and the UNDP-GEF Regional Technical Advisor will provide objective input to the annual GEF PIR covering the reporting period July (previous year) to June (current year) for each year of project implementation. The Project Coordinator will ensure that the indicators included in the project results framework are monitored annually well in advance of the PIR submission deadline and are reported on accordingly in the PIR. The PIR that is submitted to the GEF each year must also be submitted in English and shared with the NSC. The UNDP Country Office will coordinate the input of the GEF Operational Focal Point and other stakeholders to the PIR. The quality rating of the previous year's PIR will be used to inform the preparation of the subsequent PIR. The project's terminal PIR along with the terminal evaluation (TE) report and corresponding management response will serve as the final project report package. The final project report package shall be discussed with the NSC during an end-of-project review meeting to discuss lesson learned and opportunities for scaling up.

118.GEF Focal Area Tracking Tools: In line with its objective and the corresponding GEF Focal Areas/ Programs, this project will prepare the following GEF Tracking Tool(s): 2,6,8,10,13*, as agreed with the UNDP-GEF RTA.* The baseline/CEO Endorsement GEF Focal Area Tracking Tool(s) – submitted in Appendix 4 – will be updated by the Project Coordinator /Team and shared with *the mid-term review consultants* and terminal evaluation consultants before the required *review/*evaluation missions take place. The updated GEF Tracking Tool(s) will be submitted to the GEF along with the completed *Mid-term Review report* and Terminal Evaluation report.

119.Mid-term Review (MTR): An independent mid-term review process will begin after the second PIR has been submitted to the GEF, and the final MTR report will be submitted to the GEF in the same year as the 3rd PIR. The MTR findings and responses outlined in the management response will be incorporated as recommendations for enhanced implementation during the final half of the project's duration. The terms of reference, the review process and the final MTR report will follow the standard templates and guidance available on the UNDP Evaluation Resource Center (ERC). Additional quality assurance support is available from the UNDP-GEF Directorate. The final MTR report will be available in English and will be cleared by the UNDP Country Office and the UNDP-GEF Regional Technical Adviser, and approved by the NSC.

120.Terminal Evaluation (TE): An independent TE will take place before operational closure of the project. The Project Coordinator will remain on contract until the TE report and management response have been finalised. The terms of reference, the evaluation process and the final TE report will follow the standard templates and guidance available on the UNDP Evaluation Resource Center. Additional quality assurance support is available from the UNDP-GEF Directorate. The final TE report will be cleared by the UNDP Country Office and the UNDP-GEF Regional Technical Adviser, and will be approved by the NSC. The TE report will be publically available in English on the UNDP ERC.

121.The UNDP Country Office will include the planned project TE in the UNDP Country Office evaluation plan, and will upload the final TE report in English and the corresponding management response to the UNDP ERC. Once uploaded to the ERC, the UNDP Independent Evaluation Office will undertake a quality assessment and validate the findings and ratings in the TE report, and rate the quality of the TE report. The UNDP IEO assessment report will be sent to the GEF Independent Evaluation Office along with the project TE report.

122. The UNDP Country Office will retain all M&E records for this project for up to seven years after project financial closure in order to support ex-post evaluations undertaken by the UNDP Independent Evaluation Office and/or the GEF Independent Evaluation Office.

Mandatory GEF M&E Requirements and M&E Budget:

Table 5: GEF M&E budget.

GEF M&E requirements	Primary responsibility	Indicative costs to be charged to the Project Budget[65] (US$)		Time frame
		GEF grant	Co-financing	
Inception Workshop	UNDP Country Office	USD 3,000	*UNDP*	Within two months of project document signature
Inception Report	Project Manager	None	None	Within two weeks of inception workshop
Standard UNDP monitoring and reporting requirements as outlined in the UNDP POPP	UNDP Country Office	None	None	Quarterly, annually
Monitoring of indicators in project results framework	Project Manager	Per year: USD 4,000	*UNDP*	Annually
GEF Project Implementation Report (PIR)	Project Manager and UNDP Country Office and UNDP-GEF team	None	None	Annually
NEX Audit as per UNDP audit policies	UNDP Country Office	Per year: USD 3,000	*UNDP*	Annually or other frequency as per UNDP Audit policies
Supervision missions	UNDP Country Office	None[66]	*UNDP*	Annually
Oversight missions	UNDP-GEF team	None[66]	*UNDP*	Troubleshooting as needed
GEF Secretariat learning missions/site visits	Project Manager and UNDP-GEF team	None	*UNDP*	To be determined.
Mid-term GEF Tracking Tool to be updated by project M&E specialist	*Project Manager*	*USD 10,000*	*UNDP*	*Before mid-term review mission takes place.*
Independent Mid-term Review (MTR)	*UNDP Country Office and Project team and UNDP-GEF team*	*USD 35,000*	*UNDP*	*Between 2nd and 3rd PIR.*
Final GEF Tracking Tool to be updated by project M&E specialist	Project Manager	USD 10,000	*UNDP*	Before terminal evaluation mission takes place

[65] Excluding project team staff time and UNDP staff time and travel expenses.
[66] The costs of UNDP Country Office and UNDP-GEF's participation and time are charged to the GEF Agency Fee.

GEF M&E requirements	Primary responsibility	Indicative costs to be charged to the Project Budget[65] (US$)		Time frame
		GEF grant	Co-financing	
Independent Terminal Evaluation (TE) included in UNDP evaluation plan	UNDP Country Office and Project team and UNDP-GEF team	USD 35,000	*UNDP*	At least three months before operational closure
Translation of MTR and TE reports into English	*UNDP Country Office*	*USD 10,000*	*UNDP*	*As required. GEF will only accept reports in English.*
TOTAL indicative COST Excluding project team staff time, and UNDP staff and travel expenses		*USD 138,000*		

VII. GOVERNANCE AND MANAGEMENT ARRANGEMENTS

123. Roles and responsibilities of the project's governance mechanism: The project will be implemented following UNDP's National Implementation Modality, according to the Standard Basic Assistance Agreement between UNDP and the GoM, and the Country Program Action Plan (CPAP). The project will be implemented over a period of five years (60 months) by the AEDD which is the **Implementing Partner (**also known as the Project Executive). The AEDD will be responsible for the planning, coordination and implementation of the LDCF-financed project. As the Implementing Partner, it will also be responsible for reporting to the UNDP Country Office in Mali. The Implementing Partner is responsible and accountable for managing this project, including the monitoring and evaluation of project interventions, achieving project outcomes, and for the effective use of UNDP resources. The AEDD will establish a Project Management Unit in Bamako which will comprise a Project Coordinator, Project Finance and Administration Officer, Monitoring and Evaluation Officer as well as three Technical Assistants (also known as focal points).

124. The Implementing Partner will take overall responsibility for the project implementation, and the timely and verifiable attainment of project objectives and outcomes. It will provide support to, and inputs for, the implementation of all project activities. The highest authority of the Implementing Partner will serve as the National Project Director (NPD) for the project implementation. The NPD will chair the Project Steering Committee (PSC), and be responsible for providing government oversight and guidance to the project implementation The NPD will not be paid from the project funds, but will represent a government in kind contribution to the Project. The NPD will be technically supported by an international Chief Technical Adviser (CTA). The CTA will support the provision of the required technical inputs, reviewing and preparing Terms of Reference and reviewing the outputs of consultants and other sub-contractors. The CTA will be recruited using standard UNDP-CO recruitment procedures and will report directly to the NPD.

125. The **National Steering Committee** is the group responsible for making by consensus management decisions for a project when guidance is required by the Project Coordinator, including recommendation for UNDP/AEDD approval of project plans and revisions. In order to ensure UNDP's ultimate accountability, NSC decisions should be made in accordance to standards[67] that shall ensure best value

[67] UNDP Financial Rules and Regulations: Chapter E, Regulation 16.05: a) The administration by executing entities or, under the harmonized operational modalities, implementing partners, of resources obtained from or through UNDP shall be carried out under their respective financial regulations, rules, practices and procedures only to the extent that they do not contravene the principles of the Financial Regulations and Rules of UNDP. b) Where the financial governance of an executing entity or, under the harmonized operational modalities, implementing partner,

to money, fairness, integrity transparency and effective international competition. In case a consensus cannot be reached, final decision shall rest with the UNDP Programme Manager. Project reviews by this group are made at designated decision points during the running of a project, or as necessary when raised by the Project Coordinator. This group is consulted by the Project Coordinator for decisions when Project Coordinator's tolerances (normally in terms of time and budget) have been exceeded. The terms of reference for the NSC are contained in Appendix 5. The NSC is comprised of the following individuals:

Composition and organisation: The NSC contains three roles, including:

i. An **Executive**: individual representing the project ownership to chair the group. The Executive is the AEDD who will report to the NSC twice a year on the progress of the project and the emerging results.
ii. **Senior Supplier**: individual or group representing the interests of the parties concerned which provide funding and/or technical expertise to the project. The Senior Supplier's primary function within the NSC is to provide guidance regarding the technical feasibility of the project. The Senior Suppliers include representatives from Mali-Météo, DNH, and DGPC, NGOs, CSOs, municipal and village authorities, and local communities.
iii. **Senior Beneficiary**: individual or group of individuals representing the interests of those who will ultimately benefit from the project. The Senior Beneficiary's primary function within the NSC is to ensure the realization of project results from the perspective of project beneficiaries. The Senior Beneficiary group includes representatives of AEDD, Mali-Météo, municipal and village authorities, local communities, NGOs, and CSOs.

126. Based on the approved Annual Work Plan (AWP), the NSC may review and approve project quarterly plans when required and authorises any major deviation from these agreed quarterly plans. It is the authority that signs off the completion of each quarterly plan as well as authorizes the start of the next quarterly plan. It ensures that required resources are committed and arbitrates on any conflicts within the project or negotiates a solution to any problems between the project and external bodies. In addition, it approves the appointment and responsibilities of the Project Coordinator and any delegation of its Project Assurance responsibilities.

127. Potential members of the NSC are reviewed and recommended for approval during the PAC meeting. For example, the Executive role can be held by a representative from the Government Cooperating Agency or UNDP, the Senior Supplier role is held by a representative of the AEDD and/or UNDP, and the Senior Beneficiary role is held by a representative of the government or civil society. Representative of other stakeholders can be included in the NSC as appropriate.

128. The project organisation structure is as follows:

does not provide the required guidance to ensure best value for money, fairness, integrity, transparency, and effective international competition that of UNDP shall apply.

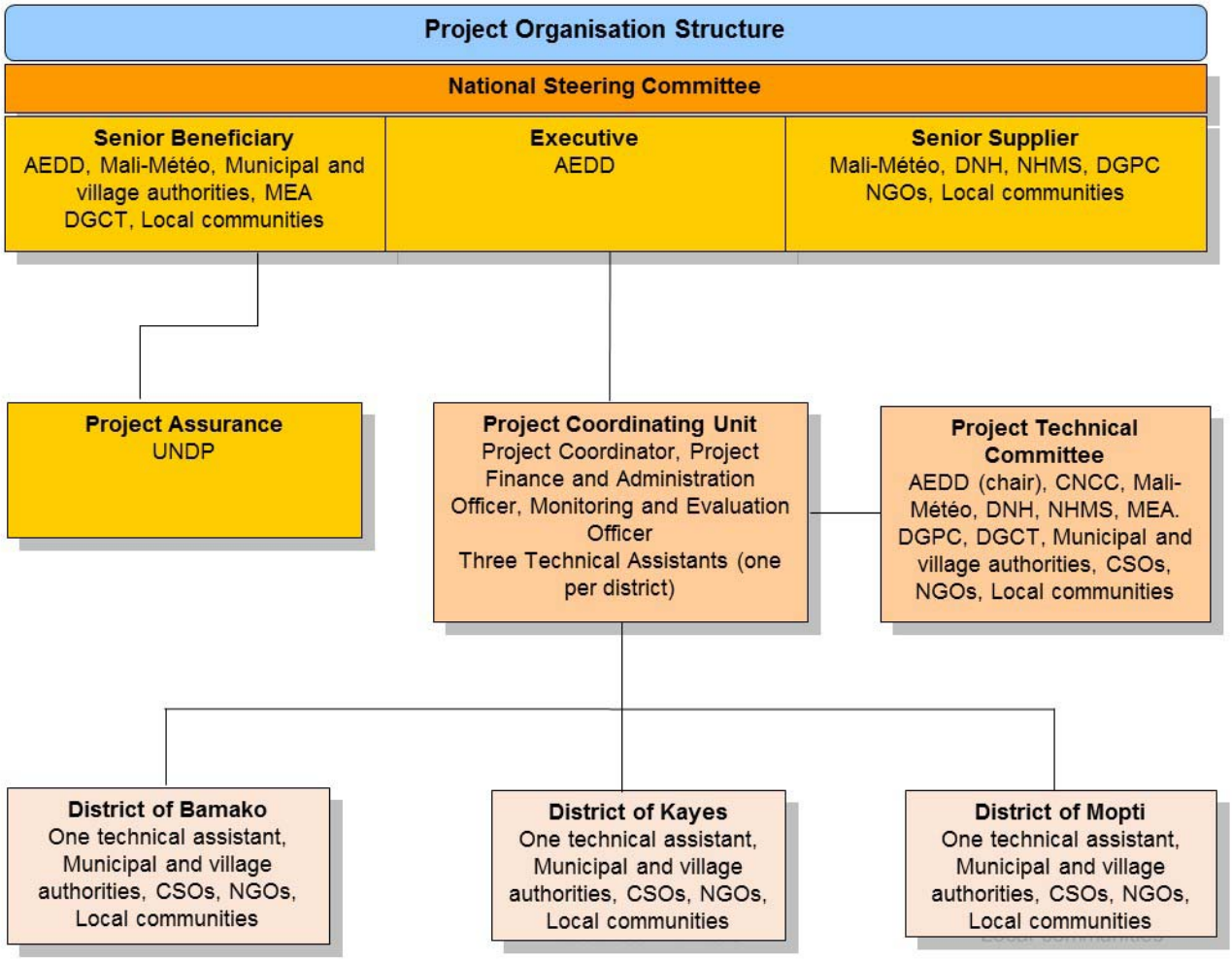

Figure 2: Organogram of management arrangements for the LDCF-financed project.

129. The specific responsibilities of the NSC are as follows:

Defining a project

- Review and approve the Initiation Plan (if such plan was required and submitted to the PAC).

Initiating a project

- Agree on Project Coordinator's responsibilities, as well as the responsibilities of the other members of the Project Coordinating Unit (PCU).
- Delegate any Project Assurance function as appropriate.
- Review the Progress Report for the Initiation Stage (if an Initiation Plan was required).
- Review and appraise detailed Project Plan and AWP, including Atlas reports covering activity definition, quality criteria, issue log, updated risk log and the monitoring and communication plan.

Running a project

- Provide overall guidance and direction to the project, ensuring it remains within any specified constraints.
- Address project issues as raised by the Project Coordinator.

- Provide guidance and agree on possible countermeasures/management actions to address specific risks.
- Agree on Project Coordinator's tolerances in the AWP and quarterly plans when required.
- Conduct regular meetings to review the Project Quarterly Progress Report and provide direction and recommendations to ensure that the agreed deliverables are produced satisfactorily according to plans.
- Review Combined Delivery Reports prior to certification by the Implementing Partner.
- Appraise the Project Annual Review Report, make recommendations for the next AWP, and inform the Outcome Board about the results of the review.
- Review and approve end project report, make recommendations for follow-on actions.
- Provide *ad-hoc* direction and advice for exception situations when project Coordinator's tolerances are exceeded.
- Assess and decide on project changes through revisions.

Closing a project

- Assure that all Project deliverables have been produced satisfactorily.
- Review and approve the Final Project Review Report, including lessons-learned.
- Make recommendations for follow-on actions to be submitted to the Outcome Board.
- Commission project evaluation (only when required by partnership agreement)
- Notify operational completion of the project to the Outcome Board.

130.*Executive*

The **Executive** – AEDD – is ultimately responsible for the project, supported by the Senior Beneficiary and Senior Supplier. The Executive's role is to ensure that the project is focused throughout its life cycle on achieving its objectives and delivering outputs that will contribute to higher level outcomes. The Executive has to ensure that the project gives value for money, ensuring a cost-conscious approach to the project, balancing the demands of beneficiary and supplier. The specific responsibilities (as part of the above responsibilities for the NSC) are:

- Ensure that there is a coherent project organisation structure and logical set of plans
- Set tolerances in the AWP and other plans as required for the Project Coordinator.
- Monitor and control the progress of the project at a strategic level.
- Ensure that risks are being tracked and mitigated as effectively as possible.
- Brief Outcome Board and relevant stakeholders about project progress.
- Organise and chair NSC meetings.

131.The Executive is responsible for overall assurance of the project as described under the section entitled "Project assurance". If the project warrants it, the Executive may delegate some responsibility for the project assurance functions.

132.*Senior Beneficiary*

The **Senior Beneficiary** is responsible for validating the needs and for monitoring that the solution will meet those needs within the constraints of the project. The role represents the interests of all those who will benefit from the project, or those for whom the deliverables resulting from activities will achieve specific output targets. The Senior Beneficiary role monitors progress against targets and quality criteria. This role may require more than one person to cover all the beneficiary interests. For the sake of effectiveness the role should not be split between too many people. The specific responsibilities of the Senior Beneficiary are (as part of the above responsibilities for the NSC):

- Ensure the expected output(s) and related activities of the project are well defined.
- Make sure that progress towards the outputs required by the beneficiaries remains consistent from the beneficiary perspective.
- Promote and maintain focus on the expected project output(s).
- Prioritise and contribute beneficiaries' opinions on NSC decisions on whether to implement recommendations on proposed changes.
- Resolve priority conflicts.

133. The assurance responsibilities of the Senior Beneficiary are to check that:

- Specification of the Beneficiary's needs is accurate, complete and unambiguous.
- Implementation of activities at all stages is monitored to ensure that they will meet the beneficiary's needs and are progressing towards that target.
- Impact of potential changes is evaluated from the beneficiary point of view.
- Risks to the beneficiaries are frequently monitored.

134. Where the project's size, complexity or importance warrants it, the Senior Beneficiary may delegate the responsibility and authority for some of the assurance responsibilities (see the section entitled "Project assurance")

135. *Senior Supplier*

The **Senior Supplier** represents the interests of the parties which provide funding and/or technical expertise to the project (designing, developing, facilitating, procuring, implementing). The Senior Supplier's primary function within the NSC is to provide guidance regarding the technical feasibility of the project. The Senior Supplier role must have the authority to commit or acquire supplier resources required. If necessary, more than one person may be required for this role. Typically, the implementing partner, UNDP and/or donor(s) would be represented under this role. The specific responsibilities of the Senior Supplier are (as part of the above responsibilities for the NSC):

- Make sure that progress towards the outputs remains consistent from the supplier perspective.
- Promote and maintain focus on the expected project output(s) from the point of view of supplier management.
- Ensure that the supplier resources required for the project are made available.
- Contribute supplier opinions on NSC decisions on whether to implement recommendations on proposed changes.
- Arbitrate on, and ensure resolution of, any supplier priority or resource conflicts.

136. The Senior Supplier assurance role responsibilities are to:

- Advise on the selection of strategy, design and methods to carry out project activities.
- Ensure that any standards defined for the project are met and used to good effect.
- Monitor potential changes and their impact on the quality of deliverables from a supplier perspective.
- Monitor any risks in the implementation aspects of the project.

137. If warranted, some of this assurance responsibility may be delegated (see the section entitled "Project assurance").

Project Coordinator

138. **Overall responsibilities:** The Project Coordinator has the authority to run the project on a daily basis on behalf of the NSC within the constraints laid down by the committee. The Project Coordinator is responsible for daily management and decision-making for the project. The Project Coordinator's prime responsibility is to ensure that the project produces the results specified in the project document, to the required standard of quality and within the specified constraints of time and cost.

139. The Implementing Partner, the AEDD, appoints the Project Manager, who should be different from the Implementing Partner's representative in the Outcome Board. Prior to the approval of the project, the Project Developer role is the UNDP staff member responsible for project management functions during formulation until the Project Coordinator from the Implementing Partner is in place. The s**pecific responsibilities** would include:

Overall project management:

- Manage the realization of project outputs through activities.
- Provide direction and guidance to project team(s)/ responsible party/ies.

- Liaise with the NSC or its appointed Project Assurance roles to assure the overall direction and integrity of the project.
- Identify and obtain any support and advice required for the management, planning and control of the project.
- Responsible for project administration.
- Liaise with any suppliers.
- May also perform Team Manager and Project Support roles.

Running a project

- Plan the activities of the project and monitor progress against the initial quality criteria.
- Mobilize goods and services to initiative activities, including drafting TORs and work specifications.
- Monitor events as determined in the Monitoring & Communication Plan, and update the plan as required.
- Manage requests for the provision of financial resources by UNDP, using advance of funds, direct payments, or reimbursement using the FACE (Fund Authorization and Certificate of Expenditures).
- Monitor financial resources and accounting to ensure accuracy and reliability of financial reports.
- Manage and monitor the project risks as initially identified in the Project Brief appraised by the PAC, submit new risks to the NSC for consideration and decision on possible actions if required; update the status of these risks by maintaining the Project Risks Log.
- Be responsible for managing issues and requests for change by maintaining an Issues Log.
- Prepare the Project Quarterly Progress Report (progress against planned activities, update on Risks and Issues, expenditures) and submit the report to the NSC and Project Assurance.
- Prepare the Annual review Report, and submit the report to the NSC and the Outcome Board.
- Based on the review, prepare the AWP for the following year, as well as Quarterly Plans if required.

Closing a Project

- Prepare Final Project Review Reports to be submitted to the NSC and the Outcome Board.
- Identify follow-on actions and submit them for consideration to the NSC.
- Manage the transfer of project deliverables, documents, files, equipment and materials to national beneficiaries.
- Prepare final CDR/FACE for signature by UNDP and the Implementing Partner.

140. The Project Coordinator's function will end when the final project TE report, and other documentation required by the GEF and UNDP, have been completed and submitted to UNDP (including operational closure of the project).

Project Assurance

141. **Overall responsibility**: Project Assurance is the responsibility of each NSC member, however the role can be delegated. The Project Assurance role supports the NSC by carrying out objective and independent project oversight and monitoring functions. This role ensures appropriate project management milestones are managed and completed.

142. Project Assurance has to be independent of the Project Coordinator; therefore the NSC cannot delegate any of its assurance responsibilities to the Project Coordinator. A UNDP Programme Officer typically holds the Project Assurance role.

143. The implementation of the assurance responsibilities needs to answer the question "What is to be assured?". The following list includes the key suggested aspects that need to be checked by the Project Assurance throughout the project as part of ensuring that it remains relevant, follows the approved plans and continues to meet the planned targets with quality.

- Maintenance of thorough liaison throughout the project between the members of the NSC.

- Beneficiary needs and expectations are being met or managed.
- Risks are being controlled.
- Adherence to the Project Justification (Business Case).
- Projects fit with the overall Country Programme.
- The right people are being involved.
- An acceptable solution is being developed.
- The project remains viable.
- The scope of the project is not "creeping upwards" unnoticed.
- Internal and external communications are working.
- Applicable UNDP rules and regulations are being observed.
- Any legislative constraints are being observed.
- Adherence to RMG monitoring and reporting requirements and standards.
- Quality management procedures are properly followed.
- NSC's decisions are followed and revisions are managed in line with the required procedures.

144. Specific responsibilities would include:
    - Initiating a project.
    - Ensure that project outputs definitions and activity definition including description and quality criteria have been properly recorded in the Atlas Project Management module to facilitate monitoring and reporting.
    - Ensure that people concerned are fully informed about the project.
    - Ensure that all preparatory activities, including training for project staff, logistic supports are timely carried out.

Running a project
- Ensure that funds are made available to the project.
- Ensure that risks and issues are properly managed, and that the logs in Atlas are regularly updated.
- Ensure that critical project information is monitored and updated in Atlas, using the Activity Quality log in particular.
- Ensure that Project Quarterly Progress Reports are prepared and submitted on time, and according to standards in terms of format and content quality.
- Ensure that CDRs and FACE are prepared and submitted to the NSC and Outcome Board.
- Perform oversight activities, such as periodic monitoring visits and "spot checks".
- Ensure that the Project Data Quality Dashboard remains "green".

Closing a project
- Ensure that the project is operationally closed in Atlas.
- Ensure that all financial transactions are in Atlas based on final accounting of expenditures.
- Ensure that project accounts are closed and status set in Atlas accordingly.

Project Support

145. **Overall responsibilities:** The **Project Support** role provides project administration, management and technical support to the Project Coordinator as required by the needs of the individual project or Project Coordinator. The provision of any Project Support on a formal basis is optional. It is necessary to keep Project Support and Project Assurance roles separate in order to maintain the independence of Project Assurance.

Specific responsibilities: Some specific tasks of the Project Support would include:

Provision of administrative services:
- Set up and maintain project files.
- Collect project related information data.
- Update plans.

- Administer the quality review process.
- Administer NSC meetings.

Project documentation management:

- Administer project revision control.
- Establish document control procedures.
- Compile, copy and distribute all project reports.

Financial Management, Monitoring and reporting

- Assist in the financial management tasks under the responsibility of the Project Manager.
- Provide support in the use of Atlas for monitoring and reporting.

Provision of technical support services

- Provide technical advices.
- Review technical reports.
- Monitor technical activities carried out by responsible parties.

146. Agreement on intellectual property rights and use of logo on the project's deliverables**:** In order to accord proper acknowledgement to the GEF for providing funding, the GEF logo will appear together with the UNDP logo on all promotional materials, other written materials like publications developed by the project, and project hardware. Any citation on publications regarding projects funded by the GEF will also accord proper acknowledgement to the GEF.

VIII. FINANCIAL PLANNING AND MANAGEMENT

147. The total cost of the project is US$ 8,925,000. This is financed through a GEF/ LDCF grant of US$ 8,925,000, USD 800,000 in cash co-financing to be administered by UNDP and US$ 50,946,907 in parallel co-financing. UNDP, as the GEF Implementing Agency, is responsible for the execution of the GEF resources and the cash co-financing transferred to UNDP bank account only.

Parallel co-financing:

Table 6: Planned LDCF activities/outputs with co-financing.

Co-financing source	Co-financing type	Co-financing amount	Planned Activities/Outputs
Government	Grant,	44,446,907	Expansion of Mali-Météo's hydro-meteorological network; Infrastructure development; and Capacity-building.
UNDP	Grant	6,000,000	Expansion of Mali-Météo's hydro-meteorological network; Infrastructure development; and Building institutional capacity.
UNDP	Cash	800,000	Offices; Equipment; Stationery; and Travel costs.
Government	Cash	500,000	Offices; Equipment; Stationery; and Travel costs.

148. The actual realization of project co-financing will be monitored during the mid-term review and terminal evaluation process and will be reported to the GEF.

149. Budget Revision and Tolerance: As per the UNDP requirements outlined in the UNDP POPP, the NSC can agree on a budget tolerance level for each plan under the overall annual work plan allowing the project manager to expend up to the tolerance level beyond the approved project budget amount for the year without requiring a revision from the NSC. Should the following deviations occur, the Project Manager and UNDP Country Office will seek the approval of the UNDP-GEF team as these are considered major amendments by the GEF: a) budget re-allocations among components in the project with amounts involving 10% of the total project grant or more; b) introduction of new budget items/or components that exceed 5% of original GEF allocation.

150. Project Closure: Project closure will be conducted as per the UNDP requirements outlined in the UNDP POPP (see (https://info.undp.org/global/popp/ppm/Pages/Closing-a-Project.aspx). On an exception basis only, a no-cost extension beyond the initial duration of the project will be sought from in-country UNDP colleagues and then the UNDP-GEF Executive Coordinator.

151. Operational completion: The project will be operationally completed when the last UNDP-financed inputs have been provided and the related activities have been completed including the final clearance of the Terminal Evaluation Report that must be available in English, and after the final NSC meeting. The Implementing Partner through a NSC decision, will notify the UNDP Country Office when the operational closure has been completed. The relevant parties will then agree on the disposal of any equipment that is still the property of UNDP.

152. Financial completion: The project will be financially closed when the following conditions have been met: a) the project is operationally completed or has been cancelled; b) the implementing partner has reported all financial transactions to UNDP; c) UNDP has closed the accounts for the project; d) UNDP and the implementing partner have certified a final Combined Delivery Report (which serves as final budget revision).

153. The project will be financially completed within 12 months of operational closure or after the date of cancellation. Between operational and financial closure, the implementing partner will identify and settle all financial obligations and prepare a final expenditure report. The UNDP Country Office will send the final signed closure documents including confirmation of final cumulative expenditure and unspent balance to the UNDP-GEF Unit for confirmation before the project will be financially closed in Atlas by the Country Office.

154. Refund to Donor: should a refund of unspent funds to the GEF be necessary, this will be managed directly by the UNDP-GEF Unit in New York.

IX. SUSTAINABILITY OF RESULTS

155. The concept of sustainability has been a central tenet in the design and development of this LDCF-financed project. The following paragraphs describe how the sustainability of the project interventions has been promoted during their design:

156. The project interventions were developed through extensive consultation with various government stakeholders at the national level including the DGPC, DNH, Mali-Météo, DGCT, DNPD and the AEDD. As a result, development priorities of the relevant sectors have been considered in the design of the project. In addition to the consultation of central government stakeholders, the following groups were involved in the development of this project including: i) sub-national institutions such as communal, municipal and village authorities; ii) members of the local communities from each intervention site; iii) NGOs, in particular women's groups; iv) CSOs; and v) tertiary education institutions (see Appendix 12 for mission reports). Stakeholder consultations that were undertaken during the PPG phase and will continue during project implementation support country ownership of the project thereby promoting the maintenance of the project outputs beyond the duration of the project.

157. The focus on improved DRM planning and implementation in this LDCF-financed project will strengthen the capacity of national and local government authorities to plan and implement climate-risk reduction measures in the short, medium and long term. Planning tools such as flood risk maps and FRRPs developed in this LDCF-financed project will improve decision-making capacity of government authorities by enabling them to prioritise DRM interventions in the most vulnerable communities.

158. As there is limited technical capacity to address flood risks within national and local government authorities, this LDCF-financed project emphasises training of government officials in several activities. Under Component 1, the technical staff from Mali-Météo, DNM, DGPC, AEDD, DNPD as well as communal, municipal and village authorities will receive training on monitoring and forecasting climate-related risks. Similarly, under Component 2, the relevant government officials will receive training on developing and interpreting flood risk maps as a flood risk planning tool to secure lives and livelihoods as well as protect existing infrastructure. Component 3 will deliver several training activities to government officials on developing and implementing on-the-ground flood risk reduction interventions to increase the resilience of local communities. The three components of the LDCF-financed project will collectively increase the technical capacity of national and local government authorities to address flood risks effectively.

159. The sustainability of LDCF-financed interventions pertaining to new equipment – for example the meteorological and hydrological stations under Component 1, and hard infrastructures built under Components 2 and 3 – is promoted through delivering training activities, the dissemination of simple technical guidelines as well as long-term maintenance plans. To promote sustainability of the interventions implemented, these plans will be developed in a participatory manner with the relevant stakeholders to increase their support for the long-term maintenance of the equipment installed. The long-term maintenance plans will detail the Terms of Reference (ToRs) along with the relevant timelines for each stakeholder involved in maintaining the equipment – both at the technical and the financial levels – financed by the LDCF. These plans will be implemented during the project's lifespan. Moreover, support will be provided to the stakeholders involved in maintaining the equipment through the implementation of training activities. The training activities, technical guidelines and participatory development of the long-term maintenance plans will be targeted at the government or non-government stakeholders.

160. Ownership of the project by the beneficiaries will be promoted by embedding local communities into decision-making throughout the project implementation phase. This intense participation process will ensure that on-the-ground project interventions directly address community needs. Additionally, an education programme and an awareness-raising campaign will be implemented under the project. The education programme will target 1 to 2 schools in each commune where multiple and varied activities will be implemented. The awareness-raising campaign will use several communication tools and streams such as pamphlets, advertising sign, creative workshops, radio and TV. These interventions will raise the support of local communities within and outside of the intervention sites thereby promoting the sustainability of – and supporting the upscaling of – the LDCF-financed project interventions.

161. This country-driven LDCF-financed project addresses major national priorities. It is therefore assumed that national and local government authorities will be willing to replicate best DRM practices in other vulnerable sites. To enable and facilitate the replication of the relevant project interventions, government officials from several ministries – including *inter alia* the environment, civil protection, forestry, water, decentralisation and planning – will receive extensive training (~US$ 400,000 of LDCF funds allocated to training and capacity-building) on the approach in the project to reduce vulnerability of local communities to floods in the intervention sites. For example, training workshops will be complemented by the dissemination of informative material such as technical guidelines on the construction and maintenance of permeable rock dams to widen stakeholders' coverage of such information and extend the benefits of training activities. Along the same line, training activities on monitoring and forecasting of climate-related hazards, flood risk mapping as well as the development and implementation of flood risk reduction interventions will support the implementation of flood-resilient development planning in other vulnerable sites in Mali. Additionally, it is expected that the strengthening of institutional and financial capacity among main government stakeholders will promote the mainstreaming of flood risks into cross-

sectoral and sectoral policies, and into sectoral planning and decision-making in the long term. This increased capacity is likely to promote the implementation of flood risk reduction interventions on the ground.

162. Under Component 2 of the LDCF-financed project, commune-specific financial strategies will be developed to expedite disaster relief and for the reconstruction of public infrastructure. The increased financial capacity of the local government authorities within the intervention sites will increase their access to funds to effectively manage the effects of climate-related hazards and natural disasters. This will support the timely response to climate-related hazards and natural disasters. The replication of such financial strategies to other local government authorities in the country will significantly strengthen Mali's response to climate-related hazards and natural disasters. Timely disaster relief has several benefits including the prevention of the spreading of diseases and the rapid reconstruction of public infrastructure to enable the undertaking of economic activities.

X. LEGAL CONTEXT

163. This document together with the CPAP signed by the Government and UNDP which is incorporated by reference constitute together a Project Document as referred to in the SBAA [or other appropriate governing agreement] and all CPAP provisions apply to this document.

164. Consistent with the Article III of the Standard Basic Assistance Agreement, the responsibility for the safety and security of the implementing partner and its personnel and property, and of UNDP's property in the implementing partner's custody, rests with the implementing partner.

165. The implementing partner shall:

- Put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried; and
- Assume all risks and liabilities related to the implementing partner's security, and the full implementation of the security plan.

166. UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.

167. The implementing partner agrees to undertake all reasonable efforts to ensure that none of the UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via http://www.un.org/Docs/sc/committees/1267/1267ListEng.htm. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.

168. Any designations on maps or other references employed in this project document do not imply the expression of any opinion whatsoever on the part of UNDP concerning the legal status of any country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries.

XI. TOTAL BUDGET AND WORK PLAN

Table 7: Total budget and work plan.

Atlas[68] Proposal or Award ID:	00095070	Atlas output Project ID : 00099106	
Atlas Proposal or Award Title:	Flood hazard and climate risk management to secure lives and assets in Mali.		
Atlas Business Unit	MLI10		
Atlas Primary Output Project Title	Gestion des risques climatiques et d'inondations au Mali en vue de préserver des vies et des biens		
UNDP-GEF PIMS No.	5236		
Implementing Partner	AEDD		

GEF Component/ Atlas Activity	Responsible Party/ (Atlas Implementing Agent)	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Total (USD)	See Budget Note
Component 1 **Outcome 1: Strengthened technical capacity of municipal and village authorities to improve flood early warning systems and dissemination of climate-related risk information.**	**AEDD**	**62160**	**LDCF**	71200	International Consultants	44,000	129,000	81,000	36,000	23,000	313,000	1.1.4.a 1.2.1.a 1.3.4.a 1.3.4.e 1.3.5.a 1.4.1.a 1.4.2.a
				71300	Local Consultants	46,000	99,000	99,000	-	-	244,000	1.1.1.a 1.1.2.a 1.1.3.a 1.1.4.c 1.2.2.a 1.2.2.e 1.2.3.a 1.3.2.a 1.3.2.b

[68] See separate guidance on how to enter the TBWP into Atlas

												1.3.3.a 1.3.3.b 1.3.4.b 1.4.1.b 1.4.2.b
				72100	Contractual Services - Companies	-	96,000	87,000	-	-	183,000	1.1.1.c 1.1.2.b 1.1.3.c 1.2.1.c 1.3.1.a
				75700	Training workshop and conferences	-	150,200	130,000	9,000	5,000	294,200	1.1.1.d 1.1.2.e 1.1.3.d 1.1.4.d 1.2.1.d 1.2.2.b 1.2.3.b 1.3.4.d 1.3.5.b 1.4.1.d 1.4.2.d
				72800	Information technology equipment	-	70,000	-	-	-	70,000	1.1.4.b
				74200	Audio Visual & Print production costs	-	94,800	82,000	37,000	-	213,800	1.1.1.e 1.1.2.d 1.1.4.e 1.2.1.e 1.2.2.c 1.2.2.d 1.3.4.c 1.4.1.c

												1.4.2.c
				72300	Materials and Goods	-	931,000	886,000	-	-	1,817,000	1.1.1.b 1.1.2.c 1.1.3.b 1.2.1.b
					Total Outcome 1	**90,000**	**1,570,000**	**1,365,000**	**82,000**	**28,000**	**3,135,000**	
Component 2 **Outcome 2. Effective flood risk management mainstreamed into the relevant development planning policies and budgetary processes to increase the resilience of local communities**	**AEDD**	**62160**	**LDCF**	71200	International Consultants	50,000	64,000	70,960	50,000	21,000	255,960	2.1.1.d 2.1.2.a 2.2.1.a 2.3.2.a 2.4.1.a
				71300	Local Consultants	70,000	58,000	24,000	30,000	-	182,000	2.1.1.a 2.1.1.b 2.1.3.a 2.1.3.e 2.1.3.f 2.1.4.a 2.2.2.a 2.3.1.a 2.3.2.b 2.4.1.b
				72100	Contractual Services - Companies	-	-	348,000	400,000	188,000	936,000	2.1.3.d
				75700	Training workshop and conferences	2,000	3,000	17,040	47,000	25,000	94,040	2.1.2.c 2.1.3.c 2.1.3.g 2.1.4.c 2.2.2.c 2.3.1.b 2.3.2.d

												2.4.1.d
				74200	Audio Visual & Print production costs	-	2,000	17,000	9,000	18,000	46,000	2.1.1.c 2.1.2.b 2.1.3.b 2.1.3.h 2.1.4.b 2.2.2.b 2.3.1.c 2.3.2.c 2.4.1.c
					Total Outcome 2	**122,000**	**127,000**	**477,000**	**536,000**	**252,000**	**1,514,000**	
Component 3 **Outcome 3. Climate-resilient flood risk management and reduction techniques transferred to local communities within the targeted communes to decrease their vulnerability.**	**AEDD**	**62160**	**LDCF**	71200	International Consultants	22,000	9,000	20,000	8,000	18,000	77,000	3.2.3.c 3.2.3.d
				74100	Professional Services	3,000	3,000	3,000	3,000	3,000	15,000	3.2.3.e
				71300	Local Consultants	45,000	98,000	92,000	47,500	30,500	313,000	3.1.1.a 3.1.1.b 3.1.2.a 3.1.3.a 3.1.3.b 3.2.1.a 3.2.2.a 3.2.2.b 3.2.3.a
				72100	Contractual Services - Companies	-	400,000	947,500	1,351,000	480,000	3,178,500	3.1.1.c 3.1.3.c 3.2.1.b 3.2.2.c 3.2.3.b

				75700	Training workshop and conferences	-	7,000	1,000	-	2,500	10,500	3.1.2.d 3.1.3.d 3.2.1.d 3.2.2.d
				74200	Audio Visual & Print production costs	-	3,000	4,000	-	-	7,000	3.1.2.c 3.2.1.c
				72300	Materials and Goods	-	120,000	80,000	30,000	20,000	250,000	3.1.2.b
					Total Outcome 3	**70,000**	**640,000**	**1,147,500**	**1,439,500**	**554,000**	**3,851,000**	
Project Management Unit	**AEDD**	**62160**	**LDCF**	72300	Materials and Goods	44,800	4,600	4,600	4,600	5,400	64,000	4.1.3.a
				72500	Supplies	8,500	1,500	1,000	1,000	1,000	13,000	4.1.2.a
				71300	Local Consultants	69,600	69,600	69,600	69,600	69,600	348,000	4.1.1.a
					Total PCU	**122,900**	**75,700**	**75,200**	**75,200**	**76,000**	**425,000**	
					Total LDCF	**404,900**	**2,412,700**	**3,064,700**	**2,132,700**	**910,000**	**8,925,000**	

Summary of Funds: [69]

Source of Fund	**Total**
GEF	$8,925,000
UNDP	$6,800,000
AEDD	$3,000,000
Mali Météo	$24,690,000

[69] Summary table should include all financing of all kinds: GEF financing, co-financing, cash, in-kind, etc...

DNACPN	$17,256,907
TOTAL	$60,671,907

Table 8: Budget notes.

Budget note	Description of cost item
1.1.1.a	National meteorologist to: i) determine which type of meteorological and hydrological stations are required and where to install them; ii) train the relevant stakeholders operating the stations on the operation and maintenance of these stations as well as the monitoring and forecasting of climate-related risks; and iii) develop and implement a long-term maintenance plan for the equipment in a participatory manner with relevant national and local institutions. (50 days @ $200/day)
1.1.1.b	Procure the meteorological and hydrological stations. 10 AWS stations @ $77,500 each and import duties.
1.1.1.c	Contractual services for the supplier of the weather stations to: i) install them; ii) compile simple technical guidelines on their operation; and iii) provide training to the relevant stakeholders on the operation of the equipment.
1.1.1.d	Training workshops for the relevant stakeholders by the national meteorologist and supplier. (50 people over the course of 5 days) Printing of training material
1.1.1.e	Dissemination of simple technical guidelines on the operation of the stations and the maintenance of the equipment to the relevant stakeholders.
1.1.2.a	National meteorologist to: i) determine the type of pluviographs required and where to install them; ii) identify potential suppliers; iii) develop a long-term maintenance plan for the equipment in a participatory manner with relevant local and national institutions; and iv) train the relevant stakeholders on the long-term maintenance of the pluviogpraphs as per the plan developed. (40 days @ $200/day)
1.1.2.b	Contractual services for the supplier of the pluviographs to: i) install them; ii) compile simple technical guidelines on their operation; and iii) provide training to the relevant stakeholders on the operation of the equipment.
1.1.2.c	Procurement of 150 pluviographs @ $800 each.
1.1.2.d	Dissemination of; i) simple technical guidelines on the operation; and ii) long-term maintenance plans.
1.1.2.e.	Training of the relevant stakeholders by the national meteorologist and supplier of the pluviographs. (1 day training workshop with 50 people). Printing of training material

1.1.3.a	National meteorologist to undertake an equipment needs assessment of the existing stations; ii) propose the list of equipment to be purchased; iii) identify potential suppliers; and iv) develop a long-term maintenance plan for the existing and new equipment. (40 days @ $200/day)
1.1.3.b	Procurement of the equipment required for the rehabilitation of the existing weather stations.
1.1.3.c	Contractual services for the supplier to: i) install the new equipment; ii) compile technical guidelines on the operation of the equipment; and iii) train the relevant people on the operation of the rehabilitated weather stations.
1.1.3.d	Training of the officials who currently operate the weather stations. (1 training workshop with 15 people over the course of two days). Approximately 3-4 people per weather station will be invited to attend the training workshop. Printing of training material
1.1.4.a	International meteorologist to: i) determine the climate modelling software to be purchased based on demands from several economic sectors and the public sector as well as an assessment of the software currently used; ii) compile training material and technical guidelines on monitoring, interpreting data and generating accurate and downscaled weather forecasts; and iii) train officials of Mali-Meteo on the use of the software, data monitoring and the interpretation of the information to generate weather forecasts for the general public as well to produce tailor-made information for specific sectors (paying service). (40 days @ $500/day with 15 days in-country; 1 flight @ $2000/flight)
1.1.4.b	Purchase the necessary climate modelling software and any equipment (if required) for accurate downscaled weather forecasting.
1.1.4.c	National communication specialist to: i) train journalists to accurately convey the downscaled weather forecasts generated by Mali-Meteo to the general public; ii) develop working agreements with radio and TV broadcasting channels for the dissemination of weather forecasts; and iii) establish agreements with potential sponsors. (50 days @ $200/day).
1.1.4.d	Training of the technical staff of Mali-Meteo by the appointed international meteorologist on monitoring, interpreting the data generated by the climate modelling software as well as the forecasts for the private sector (paying service). Training of journalists by the appointed national communication specialist to accurately convey weather-related information to the general public. (Two day training workshop with 60 journalists).
1.1.4.e	Dissemination of the technical guidelines compiled by the appointed international meteorologist on monitoring, interpreting data and generating accurate and downscaled weather forecasts to the relevant stakeholders within Mali-Meteo.
1.2.1.a	International Flood EWS Specialist to: i) design the system to be implemented; ii) identify potential suppliers; iii) oversee the implementation of the system; iv) compile simple technical guidelines on the maintenance and operation of the system; v) compile and implement a long-term maintenance plan to ensure the sustainability of the system beyond the project's lifespan; and vi) train the relevant local stakeholders on operating and maintaining the system. (50 days @ $500/day with 30 days in-country and 1 flight at $2000/flight).
1.2.1.b	Procurement of the equipment for the flood EWS.
1.2.1.c	Contractual services for the installation of the systems in the intervention sites.
1.2.1.d	Training of the technical staff from Mali-Météo, DNH, DGPC, DNUH as well as municipal and village authorities by the international flood EWS specialist on the operation and maintenance of the system. Printing of training material
1.2.1.e	Dissemination of the technical guidelines to all municipal and village authorities covered by the flood EWS.

1.2.2.a	National communication specialist to: i) hold focus groups in the interventions sites to determine their preferred means of communication and language for early warnings; ii) consider traditional practices for predicting floods and issuing warnings; iii) devise a standardised category of warnings to be endorsed by local communities; iv) elaborate on commune-specific responses to be implemented by the local authorities and local communities for each warning category such as evacuation plans; v) engage with national and local authorities to determine the responses to be put in place for each warning category; vi) train local authorities on efficiently communicating early warnings to specific local communities; vii) train the relevant members of local communities on the meaning of these warning categories and how to respond to them; viii) develop MoUs with rural radio companies, TV broadcasting channels and telecommunication companies (for dissemination of early warnings via SMS); and ix) engage with potential sponsors and develop working agreements with them. (125 days @ $200/day).
1.2.2.b	1. Focus groups (one in each commune) to be held by the appointed national communication specialist in the selected communes (with representatives including NGOs, CSOs, members of local communities from each of the 51 selected village/town, and officials from municipal/village authorities) to determine their preferred means of communication and language for early warnings and to devise a standardised category of warnings to be endorsed by local communities. Through these focus groups, commune-specific responses for each warning category will be developed. 2. Training workshops held by the appointed national communication specialist with municipal and village authorities from each commune as well as the relevant staff members from the AEDD and DGPC on efficiently communicating early warnings to local communities according to the communication strategy developed. These workshops will also be used to develop the measures that need to be implemented for each commune for each warning category. 3. Training of members of the local communities in each selected commune (with representative from each 51 villages/towns) by the appointed national communication specialist on the significance of each warning category and how to respond to them.
1.2.2.c	Dissemination of the communication strategic plan to the municipal and village authorities in each intervention site.
1.2.2.d	Awareness-raising of local communities through the distribution of pamphlets and the erection of sign boards detailing the EWS put in place as well as the categories of the early warnings, their significance, and how to respond to each warning.
1.2.2.e	National gender specialist to mainstream gender considerations in the flood risks and hazards communication strategy. The appointed specialist will assess the other interventions financed by the LDCF to adopt a gender-responsive approach in the implementation of the project. (45 days @ $200/day)
1.2.3.a	National communication specialist (appointed under Activity 1.2.2.) to: i) undertake selection workshops in each commune to ensure a fair representation of each community within the commune, vulnerable groups, women, youth ; ii) establish monitoring and management communities by appointing members for specific roles for which ToRs will be developed, and developing the structure of the committees (in collaboration with the appointed members); iii) develop MoUs between the monitoring and management committees and Mali-Météo; iv) undertake training workshop with the members of the committees on their role and responsibility collectively as a group and to increase their knowledge of the EWS, flood risks and hazards communication strategy and also on how to reach people efficiently; v) assist the monitoring and management committees in holding one training workshops (per commune) with the local communities to update their knowledge on the EWS and the flood risks and hazards communication strategy; and vi) identify and implement measures to make the monitoring and management committees operational beyond the project's lifespan. (125 days @ $200/day).

1.2.3.b	1. Selection workshops to select the representatives of the monitoring and management committees and establish a structure for the committee. A total of 100 people will be invited to attend the selection workshops. 7 training workshops (1 in each commune) in each of the seven communes selected to assist every monitoring and management committees in their first workshop/event to train local communities on the EWS and the flood risks and hazards communication strategy developed under Activity 1.2.2. (1 day training workshop with 10 people from each monitoring and management committee). 3. Operational budget to warn local communities against imminent climate-related hazards and subsequent training workshop/event (refresher course, skits, video screenings or community activities) to be held by the monitoring and management committees twice a year (within the last 2 years of the project lifespan) with members of their respective communities. Total operational budget is $35,000.
1.3.1.a	Sub-contract climate modelling study to: i) update existing climate models; ii) determine the predicted short- to medium-term change in climatic conditions and associated flood risks for the intervention sites; iii) determine which areas are at risk of climate-related hazards in the short to medium term.
1.3.2.a	National socio-economic specialist to: i) determine the indicators to be used in collecting data for vulnerability mapping in the intervention sites; ii) validate the indicators with the Project Board; iii) undertake the survey to collect the relevant data from the selected communes; iv) analyse the data collected; v) determine the projected changes in the indicators in the short and medium term; and vi) produce GIS layers of the information collected. (125 days @ $200/day)
1.3.2.b	National GIS specialist to produce GIS layers of the data collected by the appointed national socio-economic specialist. These GIS layers will be used in the vulnerability mapping in Activity 1.3.4. (40 days @ $200/day)
1.3.3.a	National consultant to map the infrastructure located within the flood-prone areas as identified under Activity 1.3.1. The mapping exercise can be based on land use maps and ground truthed by site visits. (100 days @ $200/day)
1.3.3.b	National GIS specialist (same as the one appointed under Activity 1.3.1.) to produce GIS layers showing the assets located within flood-prone areas. These GIS layers will inform the vulnerability mapping to be undertaken in Activity 1.3.4. (40 days @ $200/day)
1.3.4.a	International GIS specialist to: i) incorporate the information developed in Activities 1.3.1, 1.3.2 and 1.3.3 and compile short- to medium-term vulnerability maps for the selected communes; ii) train the relevant municipal, village and national authorities to interpret the vulnerability maps, use them as a planning tool to prioritise their interventions and increase resilience to floods. (60 days @ $500/day with 10 days in-country; flight @ $2000/flight).
1.3.4.b	National consultant to collect the existing relevant flood-related information (to be determined in collaboration with the appointed international GIS specialist) from Mali-Météo and the DNH. The national consultant will also be responsible for providing the full geospatial datasets to be included in the AEDD information system (during the project's lifespan) which is available to the public. (40 days@ $200/day)
1.3.4.c	Dissemination of maps and GIS layers to the relevant national, regional, communal and local authorities and to the public.

1.3.4.d	Training of the technical staff from the relevant national, regional, communal and local authorities on the: i) generation of these maps; ii) interpretation of the maps generated; and iii) efficient use of the maps as planning tools for future development and to prioritise DRM interventions. (3 day training workshop with 50 people). Printing of training material. The training costs total $4,000. Additional funds have been allocated for venue hire and miscellaneous costs.
1.3.4.e	International Chief Technical Advisor (212 days @ $500/day; 8 flights @ $2500/flight; 80 days in-country @ $166/day) (costs split between the three components).
1.3.5.a	International socio-economic expert to: i) quantify the predicted costs of floods in the short to medium term; ii) hold communication events to present the findings of the socio-economic study on the predicted costs of floods. (80 days @ $500/day with 10 days in-country; 1 flight @ $2000/flight)
1.3.5.b	Communication events to present the predicted cost of floods and how these were determined. 1 day event in each intervention district (3 in total and they will be held by the appointed international socio-economic expert). (50 people per communication event). Printing of training material.
1.4.1.a	International flood specialist to : i) design (in collaboration with the appointed national education specialist) an education programme for schools on local climate-related hazards, in particular floods; ii) oversee its integration in the school curriculum; and iii) develop an awareness-raising campaign targeted at children to increase their knowledge of flood risks and hazards. (50 days @ $500/day with 25 days in-country; and 2 flights @ $2,000/flight).
1.4.1.b	National education specialist to: i) undertake a transparent selection process to choose the schools that will benefit from the education programme designed in collaboration with the international flood specialist (1-2 schools per commune); ii) liaise with schools for permission to undertake activities/events related to the education programme; iii) develop the necessary material for the education programme; iv) oversee the implementation of the programme in the selected schools in the intervention sites. (200 days @ $200/day).
	National education specialist to: i) undertake a transparent selection process to choose the schools that will benefit from the awareness-raising campaign designed in collaboration with the international flood specialist (1-2 schools per commune); ii) liaise with schools for permission to undertake awareness-raising activities/events; iii) develop the necessary material for the education programme; iv) oversee the implementation of the education programme and the awareness-raising campaigns in the selected schools in the intervention sites. (200 days @ $200/day).
1.4.1.c	Development and dissemination of education and awareness-raising material for the relevant schools.
1.4.1.d	1. Training of educators by the national education specialist on the education programme developed. (at least 2 educators from each school selected). 2. Training workshops (using creative and innovative approaches) undertaken in the schools selected raise awareness through activities/events on climate change, climate risks, in particular floods, and the DRR interventions to be implemented to strengthen their resilience.
1.4.2.a	International flood specialist to; i) design training workshops on implementing locally-appropriate interventions to build resilience to floods; and ii) oversee the implementation of the awareness-raising campaigns in local communities. 50 days @ $500/day with 25 days in-country; and 2 flights @ $2,000/flight.

1.4.2.b	National communication specialist to: i) contribute to the design of the awareness-campaigns based on local knowledge; ii) determine the appropriate means of communication to reach the largest share of the population in the selected communes; iii) develop the training material; iv) liaise with radio and TV broadcasts; and v) ensure that the undertaking of the awareness-raising campaigns are undertaken in the language that is appropriate to particular areas. (200 days @ $200/day)
1.4.2.c	Compilation and dissemination of awareness-raising material within the local communities in the selected communes.
1.4.2.d	Training activities/events (using creative and innovative approaches) with local communities on climate change, climate risks, in particular floods, and the DRR interventions to be implemented to strengthen their resilience.
2.1.1.a	National GIS expert to map the extent of the existing stormwater drainage system in all seven communes. (75 days @ $200/day).
2.1.1.b	National stormwater specialist to assess the current drainage system (based on the mapping of the extent of the system, existing documentation, site visits). The assessment will point out which portions of the system need rehabilitation, maintenance or extension and the degree to which these works are required. (80 days @ $200/day)
2.1.1.c	Dissemination of the technical assessment of the stormwater drainage system to local government authorities within the selected communes to consider in their respective budget for infrastructure planning.
2.1.1.d	International Chief Technical Advisor (212 days @ $500/day; 8 flights @ $2500/flight; 80 days in-country @ $166/day) (costs split between the three components).
2.1.2.a	International flood DRM specialist to: i) assess flood risks on local communities; ii) engage with local communities to determine locally-appropriate flood risk reduction strategies that are cost-effective; iii) develop a suite of cost-effective soft and hard infrastructure to decrease the vulnerability of local communities; iv) prioritise the interventions developed (per commune) in terms of the needs of the local communities; v) provide a breakdown of the costs of realising these interventions; vi) compile the required training material and simple technical guidelines on the effectiveness of the soft and hard interventions proposed; and vii) training of the relevant technical staff from national, regional, communal and local government authorities on these cost-effective soft and hard interventions to reduce the vulnerability of local communities in interventions sites to floods. (60 days @ $500/day with 15 days in-country and 2 flights @ $2,000/flight).
2.1.2.b	Dissemination of FRRPs and the associated simple technical guidelines to the local government authorities in the selected communes.
2.1.2.c	Training of local government officials in the selected communes by the appointed international flood DRM specialist on the development, implementation and effectiveness of the soft and hard interventions. (2 day training workshop with 50 people)
2.1.3.a	National solid waste management specialist to assess: i) waste removal practices implemented by local government authorities; ii) management of solid waste before and after removal; iii) waste disposal practices adopted by local communities; and iv) current operation mode of waste transit depots. Based on the assessment described above, a long-term solid waste management plan for the effective removal and processing of solid waste will be developed in collaboration with local government authorities in Bamako. In addition, the specialist will work in close collaboration with local authorities to develop a long-term financing strategy to support the implementation of the solid waste management plan. The appointed specialist will also train the relevant technical staff from the communal and municipal authorities in Bamako on the implementation of the solid waste management plan. (250 days @ $200/day).
2.1.3.b	Dissemination of the solid waste management plan for Bamako to the relevant technical staff within the communal and municipal authorities.

2.1.3.c	1. Training of the relevant technical staff within the communal and municipal authorities by the appointed national solid waste management specialist on the implementation of the solid waste management plan. 2. Hold a communication event to present the solid waste management plan to a wide range of stakeholders and describe the benefits in terms of reduced flood risks.
2.1.3.d	Contractual services for securing existing waste transit depots and reinforcing the fencing around these structures in Bamako to prevent the establishment of settlements as a result of rapid urbanisation and the over spilling of solid waste onto surrounding areas.
2.1.3.e	National solid waste management specialist to provide input to an awareness-raising campaign on appropriate waste disposal and sanitation measures to reduce flood risks in Bamako. This will be partly based on the assessment undertaken in Activity 2.1.4. (40 days @ $200/day)
2.1.3.f	National awareness-raising specialist to; i) design a campaign based on the input of the appointed national solid waste management; ii) undertake a campaign to raise awareness of local communities in Bamako on the importance of appropriate solid waste disposal to prevent blocked waterways which lead to the increased likelihood of floods; iii) conduct community activities to clean up blocked waterways. (120 days @ $200/day).
2.1.3.g	Train local community members through awareness-raising activities to; i) demonstrate appropriate solid waste disposal methods; ii) conduct community activities to clean up blocked waterways; iii) describe the consequences of a poorly maintained solid waste management system through skits, media broadcasts, screenings.
2.1.3.h	Dissemination of pamphlets explaining the importance of adopting appropriate waste disposal practices to prevent flood risks.
2.1.4.a	National policy expert to; i) assess the Economic, Social and Cultural Development Programme (PDESC); ii) determine entry points of flood risks (developed under Activity 1.3.1.) into existing PDESC; ii) propose revisions to the existing PDESCs to incorporate short- and medium-term flood risks (determined under Activity 1.3.1) into these documents; iii) submit for validation during the project's lifespan; iv) develop a brief detailing the revisions made to the PDESC and the implications thereof; v) train the relevant officials involved on flood risk planning and the mainstreaming into long-term development plans to ensure the sustainability of investments in infrastructure. (100 days @ $200/day)
2.1.4.b	Dissemination of: i) policy brief detailing the proposed changes to the existing PDESC to local government authorities in the selected communes, DGPC, DGCT, DNPD.
2.1.4.c	Training of local government authorities, DGPC, DGCT, DNPD on flood risk planning and the integration of flood risks in governing documents such as PDESC to support the sustainability of investments in the long term.
2.2.1.a	International DRM policy expert to: i) assess the existing building and settlement codes in terms of flood risks and hazards; ii) identify entry points to increase flood risks in these codes; iii) propose revisions to the building codes to support flood resilient development and coherence among codes and other relevant governing documents; and iv) determine the need for new building codes and if deemed necessary develop accordingly. (100 days @ $500/day with 30 days in-country; 2 flights @ $2,000/flight).
2.2.2.a	National consultant to: i) liaise with the international DRM policy expert to coordinate the policy assessment; ii) submit the proposed revisions to the building codes for validation; iii) compile policy brief on the proposed revisions and if applicable develop simple technical guidelines on the new codes; and iv) train the relevant authorities on implementing the revised and new codes on the ground (50 days @ $200/day}.
2.2.2.b	Dissemination of the policy brief and if applicable technical guidelines on the new building codes to the relevant stakeholders including *inter alia* DGCT, DNPD, DGPC, municipal and village authorities.

2.2.2.c	Training of the relevant authorities including *inter alia* DGCT, DNPD, DGPC, municipal and village authorities on the: i) proposed revisions to the building codes and if applicable, new ones: ii) the anticipated benefits of the proposed revisions or if applicable, new building codes in terms of reducing food risks and decreasing the vulnerability of local communities; and iii) the implications of the proposed revisions to the existing building codes or the development of new ones on future development planning. Printing of training material. The training costs total $3,000. Additional funds have been allocated for venue hire etc
2.3.1.a	A national finance specialist to undertake an economic impact analysis will be undertaken to assess the financial capacity of local government authorities engaging in risk financing, which will improve their financial resilience to disasters.
2.3.1.b	National finance specialist to hold a communication events to present the findings of the assessment to the relevant stakeholders.
2.3.1.c	Dissemination of findings of the assessment to national and local government authorities.
2.3.2.a	International finance specialist to: i) assess the current financing mechanism used for disaster relief in Mali; ii) develop flexible and rapid financial strategies (in a participatory manner with the MoF, DGCT, DGPC as well as municipal and village authorities) per commune selected for LDCF interventions by establishing different financing strategies for climate-related hazards and natural disasters; iii) implementation of the rapid financing strategies; and iv) provide input to the training material compiled. (60 days @ $500/day with 20 days in-country and 2 flights @ $2,000/flight).
2.3.2.b	National finance expert to: i) facilitate in-country negotiations with MoF and line ministries, and local government authorities; ii) submit the financial strategies for validation by the MoF, DGCT, DGPC as well as municipal and village authorities; iii) hold communication event to present the financial strategy in each commune; iv) compile training material and guidelines on the raid financial strategies; and v) train the relevant government officials on the sources of the funds, how to access funds and how to use funds effectively once granted. (80 days @ $200/day)
2.3.2.c	Dissemination of guidelines on the rapid financial strategies to all relevant national, regional and local government authorities.
2.3.2.d	1. Communication events to present the rapid financial strategies in each commune to the relevant local (communal, municipal and village) authorities. 2. Training workshops held by the national finance specialist with the relevant government officials on how the rapid financing strategy functions and access to emergency relief funds.
2.4.1.a	International DRM flood specialist to: i) identify the climate risks faced by Mali in the short, medium and long term; ii) identify context-specific interventions that can be developed and implemented by the GoM to effectively prevent or reduce the climate risks, particularly floods, identified; iii) provide input to the training material to be developed. (40 days @ $500/day with 12 days in-country and 1 flight @ $2,000).
2.4.1.b	National DRM specialist to develop the training material and simple guidelines in collaboration with the appointed International DRM flood specialist. The specialist will hold training workshops to train the relevant national and local government officials on the : i) forecast of the likelihood and potential impact of climate-related hazards; ii) planning, development and implementation of DRM and risk reduction measures, in particular floods, in the Malian context; iii) associated costs; iv) long-term monitoring of the effectiveness of the interventions implemented. (80 days @ $200/day).
2.4.1.c	Dissemination of simple guidelines on the planning, development and implementation of DRM and risk reduction measures, in particular floods, associated costs, and the monitoring of the effectiveness of the interventions implemented.

2.4.1.d	Training workshops held by the appointed national DRM specialist to increase the technical capacity of national and local government authorities on climate risk management planning. 1. A 2 day kick-off training workshop event with national and local government authorities. (150 people over the course of 2 days). 2. 2 day training workshop with the relevant technical staff in each commune selected for LDCF interventions. (30 people over the course of 2 days for each commune). Grand total of $20,000 but additional funds have been allocated for miscellaneous costs.
3.1.1.a	National consultant to undertake an Environmental Impact Assessment with to determine the impact of the deepening of the pond. (200 days @ $200/day).
3.1.1.b	National civil engineer to undertake a feasibility assessment to: i) determine the viability and technicalities of increasing the capacity of the pond in Pignari Bana; and ii) oversee the rehabilitation. (150 days @ $200/day).
3.1.1.c	Contractual services to rehabilitate the pond which will consist of: i) excavating and deepening the pond; transport and disposal of the material excavated; undertaking any other rehabilitation works specified in the EIA such as revegetating the river banks or reshaping the river banks.
3.1.2.a	National botanist to: i) determine the appropriate plant species with climate-resilient properties to be used; ii) determine the status of the vegetation in riparian areas along the wetlands in the communes selected for LDCF intervention and prioritise them; iii) determine the location of the nurseries based on access to water, quality of soil, proximity to transport routes and availability of labour; iv) compile planting protocols; v) train members of the local communities on establishing a nursery to produce seedlings and planting; and vi) supervise the establishment of 3 nurseries (one per district) and planting exercises on the ground. (80 days @ $200/day).
3.1.2.b	Material, equipment and labour for the establishment of 3 nurseries and planting of climate-resilient indigenous species. For example, bush or grass knives, wheelbarrows, spades, shovels, polybags, tape measure, alignment wire, marker pegs, hose, watering cans are required for the establishment of plant nurseries.
3.1.2.c	Dissemination of planting protocols to the relevant local municipal and village authorities and the DNH.
3.1.2.d	Training of members of the local communities by the appointed national botanist on the: i) establishment and operation of the nurseries; ii) planting protocols. The appointed national botanist will demonstrate how planting should be undertaken as per the protocols.
3.1.3.a	National engineer to undertake a feasibility study to: i) design a network of canals (in collaboration with communal, municipal and village authorities as well as the DNH and DGPC) so as to minimise water runoff from reaching local communities situated at the bottom of the slopes of Mount Madingues in commune IV in Bamako; ii) determine whether the wetlands located in Wowowowanko, Farako and Diafaranako have the capacity to hold additional water runoff; iii) amend the design of the network of canals based on the outcome of the EIA undertaken; iv) oversee the construction works; v) develop a long-term maintenance plan to be implemented by local government authorities and the local communities located in commune IV; and vi) train local government authorities and communities on the maintenance of the canals. (300 days @ $200/day)
3.1.3.b	National consultant to undertake an EIA to determine the potential environmental impacts of diverting water runoff into the ponds in Wowowowanko, Farako and Diafaranako. (150 days @ $200/day)
3.1.3.c	Contractual services for the construction of the network of canals.

3.1.3.d	Training of communal, municipal and village authorities, DNH and DGPC as well as members of local communities on maintaining the network of canals to ensure its effectiveness in the long term. (2 day training workshop with 45 people)
3.2.1.a	National DRM specialist to undertake a feasibility assessment to determine: i) the location of the permeable rock dams; ii) the material to be used; iii) compile technical guidelines on the purpose of these rock dams; iv) develop a long-term maintenance plan describing the roles and responsibilities of local government authorities and local communities selected for LDCF interventions; v) develop MoUs between the local communities and government authorities for the maintenance of the permeable rock dams constructed; vi) oversee construction activities. (75 days @ $200/day).
3.2.1.b	Contractual services to: i) source and purchase the material for the permeable rock dams; ii) load and offload the construction material; iii) acquire the required machinery; iv) rent trucks for the transport of construction material; and v) construction of the permeable rock dams (largely using locally sourced labour). 1. Purchase of the construction material. 2. Transport of material (truck rental). 3. Labour to load and offload construction material. 4. Construction of rock dams.
3.2.1.c	Dissemination of technical guidelines to all other communal, municipal and village authorities in flood-prone areas to replicate and/or upscale the use of permeable rock dams to prevent or reduce floods risks.
3.2.1.d	Training of the relevant municipal and village authorities as well as local authorities by the appointed DRM specialist on the: i) maintenance plan for the permeable rock dams; and ii) the different roles and responsibilities of the government authorities and local communities in maintaining these structures to ensure their long-term sustainability.
3.2.2.a	National stormwater specialist to: i) undertake a feasibility assessment for the construction of drains: ii) determine where drains would be best located; iii) oversee the construction of drains; iv) develop commune-specific long-term management plan through extensive consultation with communal, municipal and village authorities to ensure that the stormwater drains are maintained on a regular basis for optimum operation; and v) provide training to the technical staff from municipal and village authorities on the implementation of the commune-specific long-term maintenance plan. (120 days @ $200/day).
3.2.2.b	National civil engineer to: i) collaborate with the appointed national stormwater specialist to design the stormwater drains; ii) oversee the construction of the drains; and iii) provide input to the development of a long-term maintenance management plan. (240 days @ $200/day).
3.2.2.c	Contractual services for the purchase of the material required and the construction of 25 km of stormwater drains.
3.2.2.d	Training workshop by the appointed national stormwater specialist with technical staff from communal, municipal and village authorities, DNH, and the DGPC on the maintenance of stormwater drains. (2 day training workshop with 45 people)
3.2.3.a	National stormwater specialist (appointed under Activity 3.2.2.) to: i) determine the sections of the existing stormwater drainage system that require strengthening, maintenance or clean-up (based on assessment undertaken in Activity 2.1.2 and consultation with the relevant stakeholders); ii) ensure that the maintenance works are in alignment with the long-term maintenance plan developed under Activity 3.2.2.; iii) supervise the maintenance works. (250 days @ $200/day).
3.2.3.b	Contractual services for the maintenance works (wherever possible, local labour should be sourced).

3.2.3.c	International Chief Technical Advisor (212 days @ $500/day; 8 flights @ $2500/flight; 80 days in-country @ $166/day) (costs split between the three components).
3.2.3.d	International consultants for Initiation workshop ($3,000), Baseline Assessment ($25,000), Mid-term evaluation ($35,000) and Terminal Evaluation ($35,000) (costs split between the three components)
3.2.3.e	Service contracts for annual project audits as per UNDP financial rules and regulations
4.1.1.a	Project coordinator's salary ($1,800/month)
4.1.1.b	3 Technical Assistants salary ($700/month each)
4.1.1.c	Admin and Finance officer salary ($1,000/month)
4.1.1.d	M&E Consultant ($900/month)
4.1.2.a	Office rental; Office supplies; 4 laptops ($1,500 each)
4.1.3.a	1 car (@$35,000), 2 motorbikes (@ $3,000 each), Gasoline, 4 cell phones (@ $50 each), Airtime

XII. MANDATORY ANNEXES

Appendix 1	Multi-year workplan
Appendix 2	Monitoring plan
Appendix 3	Evaluation plan
Appendix 4	GEF tracking tools at baseline
Appendix 5	Terms of Reference for Project Board, Project Manager, Chief Technical Advisor and other relevant positions
Appendix 6	UNDP Social and Environmental and Social Screening Template
Appendix 7	Co-financing letters
Appendix 8	Alignment with policies
Appendix 9	Problem tree
Appendix 10	Institutional and policy context
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Appendix 13	Maps

Appendix 1: Multi Year Work Plan

Expected output	Planned activity	Timeframe					Responsible Party	Planned budget		
		Y1	Y2	Y3	Y4	Y5		Funding source	Title	Total GEF/LDCF ($)
Output 1.1.: A sound climate information system comprising devices operating 24 hours a day to monitor and forecast flood risks and hazards is established.	1.1.1. Procure and install 10 meteorological and hydrological stations in the intervention sites – i.e. two stations in communes I, IV and VI of Bamako (6 in total), and one in each selected commune in the districts of Kayes and Mopti (4 in total). Training material and guidelines on the operation and maintenance of the equipment installed will be developed and disseminated to the relevant stakeholders. In addition, develop and implement a long-term maintenance plan for the meteorological and hydrological stations.	10,000	0	0	0	0	Mali-Météo; DNH; DGPC; AEDD; Municipal and village authorities; and ENI-ABT.	LDCF	National meteorologist	10,000
		0	775,000	0	0	0			Material/equipment for climate monitoring	775,000
		0	8,000	0	0	0			Contractual services for the supplier	8,000
		0	7,000	0	0	0			Training on the operation and maintenance of the meteorological and hydrological stations	7,000
		0	3,000	0	0	0			Information dissemination	3,000
	1.1.2. Procure and install 150 pluviographs in the intervention sites – 50 pluviographs per district. Training material and technical guidelines on the	8,000	0	0	0	0			National meteorologist	8,000
		0	9,000	0	0	0			Contractual services for the supplier	9,000
		0	120,000	0	0	0			Material/equipment for monitoring water levels	120,000
		0	1,800	0	0	0			Information dissemination	1,800

	operation as well as a long-term maintenance plan will be developed and disseminated to all the stakeholders operating the pluviographs.	0	1,200	0	0	0			Training on the operation and maintenance of the pluviographs	1,200
	1.1.3. Undertake an equipment needs assessment of the existing weather stations in Kita, Sotuba, Douentza and Bandiagara and rehabilitate accordingly to improve data monitoring and transmission.	8,000	0	0	0	0			National meteorologist	8,000
		0	36,000	36,000	0	0			Material/equipment for rehabilitation of existing stations	72,000
		0	4,000	0	0	0			Contractual services for the supplier	4,000
		0	2,000	0	0	0			Training on the operation and maintenance of the rehabilitated weather stations	2,000
	1.1.4. Generate accurate downscaled daily, weekly and seasonal weather forecasts for the general public. Undertake a market analysis to determine the needs and opportunities in the private weather forecasting industry in the country for downscaled tailor-made weather forecasts. Train the technical staff of Mali-Météo on generating and communicating such information to the private sector.	0	26,000	0	0	0			International meteorologist	26,000
		0	70,000	0	0	0			Climate modelling software	70,000
		0	0	10,000	0	0			National communication specialist	10,000
		0	0	12,000	0	0			Training of technical government staff and journalists	12,000
		0	0	5,000	0	0			Information dissemination	5,000

1.2. Early warning and quick-response systems are developed to increase the resilience of vulnerable local communities in the intervention sites.	1.2.1. Implement flood early warning audio alert systems comprising 32 sensors and audible warning devices – a total of seven in Bamako, 11 in Kayes and 14 in Mopti – to generate early warnings.	0	35,000	0	0	0	DGPC; Mali-Météo; DNH; Municipal and village authorities; DNUH; and ENI-ABT.	LDCF	International Flood EWS Specialist	35,000
		0	0	850,000	0	0			Material/equipment for the EWS	850,000
		0	0	12,000	0	0			Contractual services for the installation of the EWS	12,000
		0	0	5,000	0	0			Training of technical government staff on the operation and maintenance of the EWS	5,000
		0	0	4,000	0	0			Information dissemination	4,000
	1.2.2. Develop a detailed flood risks and hazards communication strategy based on the input of a gender specialist and in collaboration with the local communities. This strategy will comprise: i) preferred methods of communication of potential flood risks and hazards per commune; ii) the preferred language of warnings; iii) the description of a standardised category of warnings to be used across all means of communication; and iv) commune-specific responses to be implemented by the local authorities and communities for each warning category such as evacuation plans.	0	12,500	12,500	0	0			National communication specialist	25,000
		0	10,000	4,000	0	0			Training of government staff and local communities	14,000
		0	0	3,000	0	0			Information dissemination	3,000
		0	0	12,000	12,000	0			Awareness-raising of local communities	24,000
		0	9,000	0	0	0			National gender specialist	9,000
	1.2.3. Establish monitoring and	0	12,500	12,500	0	0			National communication specialist	25,000

	management committees between the selected communes and Mali Météo to effectively disseminate flood warnings. These committees will also periodically provide training to local communities on the different warning categories and the appropriate responses to be adopted.	0	15,000	10,000	5,000	5,000			Training of the monitoring and management committees and for awareness-raising	35,000
1.3. Flood vulnerability mapping combining risks with socio-economic indicators – including inter alia population size, land value, land uses, assets – is undertaken.	1.3.1. Determine short- and medium-term flood risks and exposure based on updated and downscaled climate models. Map the areas that are exposed to floods are at risk in the short to medium term.	0	75,000	75,000	0	0	DGPC; DNPD; DNH; AEDD; Mali-Météo; ENI-ABT; DGCT; Other line ministries; and Municipal and village authorities.	LDCF	Sub-contract climate modelling study	150,000
	1.3.2. Collect and analyse socio-economic data based on indicators – including inter alia population size and density, settlement patterns, land uses and value, sources of livelihoods and infrastructure – and determine any projected change scenarios in these variables in the short and medium term.	0	25,000	0	0	0			National socio-economic specialist	25,000
		0	0	8,000	0	0			National GIS specialist	8,000

	1.3.3. Develop an inventory of flood-vulnerable assets in the communes selected for LDCF interventions to prioritise DRM interventions.	0	0	20,000	0	0			National consultant to map infrastructure	20,000
		0	0	8,000	0	0			National GIS specialist	8,000
	1.3.4. Undertake short- to medium-term flood risk mapping using GIS to overlay flood risks and exposure data (as determined in Activity 1.3.1), socio-economic information (Activity 1.3.2) and flood-vulnerable assets (Activity 1.3.3.). Develop a flood vulnerability index to facilitate planning of DRM interventions. The flood vulnerability maps will be made accessible to the public.	0	15,000	20,000	0	0			International GIS specialist	35,000
		0	0	8,000	0	0			National consultant to collect existing climate-related information	8,000
		0	0	8,000	0	0			Information dissemination	8,000
		0	0	4,000	0	0			Training of technical government staff	4,000
		12,000	12,000	12,000	11,000	10,000			International Chief Technical Advisor	57,000
	1.3.5. Quantify the socio-economic costs of floods in the short to medium term based on risks, vulnerability of local communities and potential loss or damage to assets located in flood-prone areas. The costs and benefits of alternative adaptation options for flood management will be analysed with the engagement of local universities/research centres. The results of this work will be integrated into the ongoing NAP-related	0	0	20,000	25,000	0			International socio-economic expert	45,000
		0	0	0	4,000	0			Communication events to present the predicted cost of floods	4,000

	activities.									
1.4. An education programme and awareness-raising campaign is undertaken within schools and local communities to build a culture of safety and resilience to floods.	1.4.1. Develop and integrate an education programme in the school curriculum and raise awareness on the prevention of climate risks, in particular floods, to decrease the vulnerability of school children.	15,000	21,000	0	0	0	DGPC; Ministry of Education; and Municipal and village authorities.	LDCF	International flood specialist	36,000
		20,000	20,000	0	0	0			National education specialist	40,000
		0	90,000	0	0	0			Information dissemination	90,000
		0	40,000	20,000	0	0			Training of educators and awareness-raising of school children	60,000
	1.4.2. Conduct awareness-raising campaigns through training workshops, radio and TV broadcasts, display boards, skits and SMS on building resilience of local communities to floods.	0	20,000	16,000	0	0			International flood specialist	36,000
		0	20,000	20,000	0	0			National communication specialist	40,000
		0	0	50,000	25,000	0			Information dissemination	75,000
		0	75,000	75,000	0	0			Training activities/events with local communities	150,000
2.1. Commune-specific Flood Risk Reduction Plans (FRRP) with locally-appropriate strategies and interventions to decrease the vulnerability of local communities to floods are developed.	2.1.1. Conduct a technical assessment of the existing stormwater drainage systems in the selected communes.	15,000	0	0	0	0	Municipal and village authorities; DGPC; AEDD; DNPD; ENI-ABT; and DGCT.	LDCF	National GIS expert	15,000
		10,000	6,000	0	0	0			National stormwater specialist	16,000
		0	2,000	0	0	0			Information dissemination	2,000
		12,000	12,000	12,000	11,000	10,000			International Chief Technical Advisor	57,000
	2.1.2. Develop commune-specific FRRPs in a participatory manner with local communities. These plans will provide a roadmap to local authorities for the development of best-practice soft and hard adaptation interventions to reduce flood risks.	0	0	15,000	23,000	0			International flood DRM specialist	38,000
		0	0	0	2,000	0			Information dissemination	2,000
		0	0	0	2,000	0			Training of government officials on the FRRPs	2,000
	2.1.3. Improve solid waste management in Bamako by: i) undertaking an assessment of the	20,000	30,000	0	0	0			National solid waste management specialist	50,000
		0	0	3,000	0	0			Information dissemination	3,000
		0	0	9,000	0	0			Training and	9,000

	current waste removal and management systems to identify gaps; and ii) reinforcing the fencing around existing waste transit depots; and iii) undertaking awareness-raising campaigns with local communities on adopting appropriate waste disposal practices to reduce flood risks.								communication events	
		0	0	348,000	400,000	188,000			Contractual services for securing waste transit depots	936,000
		0	0	8,000	0	0			National solid waste management specialist	8,000
		0	0	0	24,000	0			National awareness-raising specialist	24,000
		0	0	0	25,000	25,000			Training local communities on appropriate solid waste disposal practices	50,000
		0	0	0	0	18,000			Information dissemination	18,000
	2.1.4. Integrate short- to medium-term flood risks into the existing Economic, Social and Cultural Development Programme (PDESC) for the selected communes.	20,000	0	0	0	0			National policy expert	20,000
		0	0	2,000	0	0			Information dissemination	2,000
		2,000	0	0	0	0			Training of government staff	2,000
2.2. Design, harmonize and enhance existing building and settlement codes to decrease vulnerability of local communities to floods.	2.2.1. Assess and propose revisions to strengthen existing building, and settlement codes and the associated land-use plans by integrating considerations relating to flood risks into them.	25,000	37,000	0	0	0	DGPC; DNPD; AEDD; DNUH; Mali-Météo; DGCT; DNAT; and Municipal and village authorities.	LDCF	International DRM policy expert	62,000
	2.2.2. Develop policy briefs to detail the proposed revisions and submit the revised documents for approval. If necessary, develop new building and settlement codes for the intervention sites. Integrate the	5,000	5,000	0	0	0			National consultant	10,000
		0	0	0	3,000	0			Information dissemination	3,000
		0	3,000	0	0	0			Training of government officials on the proposed revisions to the building codes	3,000

	revised land-use plans into the existing PDESC.									
2.3. Financial strategies are developed and implemented to improve the financial capacity of local authorities to respond timely to climate-related hazards, in particular floods.	2.3.1. Undertake an economic impact analysis to assess risk financing in the Malian context and the financial capacity of the local government authorities within the intervention sites.	0	10,000	3,000	0	0	MoF; DGPC; DGCT; ENI-ABT; DGCT; and Municipal and village authorities.	LDCF	National financial specialist	13,000
		0	0	3,000	0	0			Training of government officials	3,000
		0	0	2,000	0	0			Information dissemination	2,000
	2.3.2. Develop and implement commune-specific financial strategies to facilitate assistance to local communities affected by climate-related hazards, in particular floods, and for the reconstruction of public infrastructure.	0	15,000	17,960	0	0			International finance specialist	32,960
		0	7,000	3,000	0	0			National finance expert	10,000
		0	0	10,000	0	0			Information dissemination	10,000
		0	0	5,040	0	0			Training of the government officials on the financing strategies	5,040
2.4. The technical capacity of the relevant national and local authorities on climate risk management planning as well as flood prevention and reduction measures is enhanced.	2.4.1. Provide training to the relevant national and local government officials within the targeted communes on climate risk management, preventing and minimising the negative effects of climate-related hazards, in particular floods, on vulnerable local communities.	0	0	15,000	16,000	0	AEDD; DGPC; ENI-ABT; DGCT; Mali-Météo; DNH; and Municipal and village authorities.	LDCF	International DRM flood specialist	31,000
		0	0	10,000	6,000	0			National DRM specialist	16,000
		0	0	0	4,000	0			Information dissemination	4,000
		0	0	0	20,000	0			Training of government officials on climate risk management	20,000
3.1. Flood risk reduction interventions are implemented to increase water infiltration and reduce soil erosion.	3.1.1. Rehabilitate the wetland in Pignari Bana to increase its water holding capacity	25,000	15,000	0	0	0	DGPC; DNH; DNACPN; NGOs; ENI-ABT; CSOs; and Municipal and village authorities.	LDCF	National consultant to undertake EIA	40,000
		0	15,000	10,000	2,500	2,500			National civil engineer to undertake a feasibility assessment	30,000
		0	0	200,000	250,000	30,000			Contractual services to rehabilitate the pond	480,000
	3.1.2. Rehabilitate at	5,000	6,000	5,000	0	0			National botanist	16,000

	least 10 km of riparian areas of wetlands with climate-resilient indigenous plant species in each of the seven communes selected for LDCF intervention (70 km in total).	0	120,000	80,000	30,000	20,000			Material and equipment for the establishment of 3 nurseries and planting activities	250,000
		0	3,000	0	0	0			Information dissemination	3,000
		0	4,000	0	0	0			Training of members of the local communities	4,000
	3.1.3. Develop a network of canals to channel water runoff from Mount Madingues in commune IV in Bamako into wetlands located in Wowowowanko, Farako and Diafaranako.	0	40,000	15,000	5,000	0			National engineer to undertake a feasbility study	60,000
		15,000	15,000	0	0	0			National consultant to undertake an EIA	30,000
		0	400,000	372,000	146,000	0			Contractual services for the construction of the network of canals	918,000
		0	3,000	0	0	0			Training of government officials on the maintenance of the network of canals	3,000
3.2. Flood risk reduction interventions are implemented to reduce the vulnerability of human lives and infrastructure.	3.2.1. Undertake a feasibility assessment for the construction of permeable rock dams in the intervention sites.	0	7,000	3,000	3,000	2,000	DGPC; DNH; ENI-ABT; NGOs; CSOs; and Municipal and village authorities.	LDCF	National DRM specialist to undertake a feasibility assessment	15,000
		0	0	50,000	40,000	25,000			Contractual services for the construction of the permeable rock dams	115,000
		0	0	4,000	0	0			Information dissemination	4,000
		0	0	1,000	0	0			Training of government authorities on the maintenance of the permeable rock dams	1,000
	3.2.2. Undertake a feasibility assessment for the construction of 25 kilometres of stormwater drains. This activity will be based on Output 2.1. and will include the construction of five kilometres of stormwater drains in communes I, IV, VI, Sébékoro and Fatoma.	0	0	24,000	0	0			National stormwater specialist to undertake a feasibility assessment for the construction of drains	24,000
		0	0	10,000	22,000	16,000			National civil engineer	48,000
		0	0	250,500	750,000	375,000			Contractual services for the construction of the stormwater drains	1,375,500
		0	0	0	0	2,500			Training workshop on the maintenance of stormwater drains.	2,500
	3.2.3. Clean and	0	0	25,000	15,000	10,000			National stormwater	50,000

	maintain existing stormwater drains in the targeted communes.								specialist	
		0	0	75,000	165,000	50,000			Contractual services for the maintenance works	290,000
		12,000	12,000	12,000	11,000	10,000			International Chief Technical Advisor	57,000
		239,000	2,337,000	2,954,500	2,057,500	799,000				8,387,000
		21,600	21,600	21,600	21,600	21,600			Project Coordinator 's salary	108,000
		25,200	25,200	25,200	25,200	25,200			Technical's Assistant's salary	126,000
		12,000	12,000	12,000	12,000	12,000			Admin and Finance Officer's salary	60,000
		10,800	10,800	10,800	10,800	10,800			M&E consultant	54,000
		35,000	0	0	0	0			1 Car	35,000
		6,000	0	0	0	0			2 motorbikes	6,000
		3,000	4,000	4,000	4,000	4,800			Gasoline	19,800
		6,000	0	0	0	0			4 laptops	6,000
		200	0	0	0	0			4 cellphones	200
		600	600	600	600	600			Airtime	3,000
		1,000	1,000	1,000	1,000	1,000			Office rental	5,000
		1,500	500	0	0	0			Office supplies	2,000
		122,900	75,700	75,200	75,200	76,000				425,000
		40,000	0	0	0	0			Baseline assessment	40,000
		0	0	35,000	0	0			Mid-Term Evaluation	35,000
		0	0	0	0	35,000			Terminal Evaluation	35,000
		3,000	0	0	0	0			Inception workshop	3,000
		43,000	0	35,000	0	35,000				113,000
		404,900	2,412,700	3,064,700	2,132,700	910,000				
										8,925,000

Appendix 2: Monitoring Plan.

Monitoring	Indicators	Description	Data source/Collection Methods	Frequency	Responsible for data collection	Means of verification	Assumptions and Risks
Project objective: **To strengthen the capacity of national and local government authorities to effectively manage the negative effects of floods on local communities and infrastructure in Mali.**	**Indicator 1:** Technical and institutional capacity of municipal and village authorities, Mali-Météo, DNH and DGPC to effectively manage flood risks [adapted from AMAT Indicator 10].	Review of scorecards.	Capacity scorecard assessment of the technical officials within municipal and village authorities, Mali-Météo, DNH and DGPC. The following criteria will be used: 1. Ability to analyse data from weather stations and disseminate flood early warnings to vulnerable communities timely. 2. Capacity to assess flood risks under the predicted conditions of climate change (given the necessary tools such as the flood risk maps). 3. Capacity to develop and effectively implement flood risk management and reduction interventions to decrease the vulnerability of local communities in the intervention sites. The scorecard rating is	Thrice – during baseline assessment, MTR and Terminal Evaluation.	Project consultants (Baselines, MTR and Terminal Evaluation Specialists) and M&E Specialist (appointed as part of the Project Coordinating Unit).	Project consultants' and M&E reports.	Risk: Insufficient political and financial support from the GoM. Assumption: The GoM has the financial capacity to support the maintenance of the project interventions. Risk: Limited coordination among government authorities. Assumption: Adequate involvement of and coordination between government authorities will enable the maintenance of a good progress rate for the project implementation and promote sustainability.

			as follows: 1 = No capacity or very limited capacity at the individual level and within the respective government institution. 2 = Partially developed capacity at the individual level. 3 = Partially developed capacity at the individual level and within the respective government institution. 4 = Fully developed and demonstrated capacity at the individual level. 5 = Fully developed and demonstrated capacity at the individual level and within the respective government institution.				
Project Outcome 1 Strengthened technical capacity of municipal and village authorities to improve flood early warning systems and dissemination of climate-related risk information.	**Indicator 1:** Number of people (% of whom are women) with access to improved flood EWS [adapted from AMAT 8].	Document review.	Analysis of maps (at least one per commune) delineating the extent of the flood EWS and the population size covered.	Twice – during MTR and Terminal Evaluation.	Project consultants (MTR and Terminal Evaluation Specialists) and M&E Specialist (appointed as part of the Project Coordinating Unit).	Project consultants' and M&E reports.	Risk: Inadequate coordination between national and local (communal, municipal and village) authorities. Assumption: Coordination between national and local government will enable successful implementation of the project. Risk: Insufficient political and financial support from the GoM. Assumption: The GoM has the financial capacity to support the maintenance of the

							project interventions. Risk: Unclear distribution of the roles for the maintenance of meteorological and hydrological stations, pluviographs, network of canals to divert water, permeable rock dams, and stormwater drains. Assumption: The development and implementation of long-term maintenance plans will strengthen the technical and financial capacity of the relevant stakeholders to maintain the new equipment.
	Indicator 2: Number of monitoring and management committees established (composed of at least 50% women).	Document review.	Review of the official list of committee members which is to be included in the MoU with Mali-Météo.	Twice – during MTR and Terminal Evaluation.	Project consultants (MTR and Terminal Evaluation Specialists) and M&E Specialist (appointed as part of the Project Coordinating Unit).	List of committee members, project consultants' and M&E reports.	Risk: Project interventions are not gender-sensitive. Assumption: The participation of women's groups in the design and implementation of the project promotes the distribution of benefits in a gender-sensitive manner.
Project Outcome 2 Effective flood risk management mainstreamed into the relevant development planning policies and	**Indicator 1:** Number of Economic, Social and Cultural Development Programme (PDESC) revised to include short- to medium-	Document review.	Review of the revised PDESC.	Twice – during MTR and Terminal Evaluation.	Project consultants (MTR and Terminal Evaluation Specialists) and M&E Specialist (appointed as part of the Project Coordinating Unit).	Review of the revised PDESC, project consultants' and M&E reports.	Risk: Limited coordination among government authorities. Assumption: Adequate involvement of and coordination between government authorities will enable the maintenance of a good progress rate for the project implementation

budgetary processes to increase the resilience of local communities.	term flood risks [adapted from AMAT 13].						and promote sustainability Risk: Inadequate coordination between national and local (communal, municipal and village) authorities. Assumption: Coordination between national and local government will enable successful implementation of the project.
	Indicator 2: Number of commune-specific Flood Risk Reduction Plans (FRRPs) developed in a participatory manner with local communities [adapted from AMAT 13].	Document review.	Review of the FRRPs produced.	Twice – during MTR and Terminal Evaluation.	Project consultants (MTR and Terminal Evaluation Specialists) and M&E Specialist (appointed as part of the Project Coordinating Unit).	FRRPs, project consultants' and M&E reports.	Risk: Project interventions are not gender-sensitive. Assumption: The participation of women's groups in the design and implementation of the project promotes the distribution of benefits in a gender-sensitive manner.
Project Outcome 3 Climate-resilient flood risk management and reduction techniques transferred to local communities within the	**Indicator 1:** Number of km of stormwater drains constructed and rehabilitated to decreased flood risks [adapted from AMAT	Field visit and document review.	Interviews with local communities. Measurement of the length of stormwater drains constructed and rehabilitated. Review of the maintenance systems in place. Review of construction and maintenance	Yearly	M&E (appointed as part of the Project Coordinating Unit) and MTR Specialists.	Project consultants' reports detailing: i) interviews with local communities; ii) length of length of stormwater drains constructed and rehabilitated; iii) maintenance progress reports. M&E reports.	Risk: Unclear distribution of the roles for the maintenance of meteorological and hydrological stations, pluviographs, network of canals to divert water, permeable rock dams, and stormwater drains. Assumption: The development and implementation of long-

targeted communes to decrease their vulnerability.	2].		progress reports to be provided by the contracted company to the Project Management Unit.				term maintenance plans will strengthen the technical and financial capacity of the relevant stakeholders to maintain the new equipment. Risk: Insufficient support from the beneficiary communities to implement the project successfully as benefits are not apparent immediately and only become evident in the event of floods. Assumption: Involvement in the design of project interventions and ongoing communication on the expected benefits of the activities for local communities will result in the support of the project by these communities. Risk: Project interventions are not gender-sensitive. Assumption: The participation of women's groups in the design and implementation of the project promotes the distribution of benefits in a gender-sensitive manner. Risk: Interventions in the district of Mopti are delayed by ongoing conflicts Assumption: There is no

							civil unrest in the intervention sites during the implementation of the project. Risk: Climate hazards delay the implementation of project interventions. Assumption: Scheduling of activities based on potential climate risks enables climate-induced delays in the implementation of project interventions to be prevented.
	Indicator 2: Number of km of riparian areas revegetated with climate-resilient species.	Field visit and document review.	Site visits to verify the extent of riparian area revegetated. Review of progress reports on revegetation interventions. Interviews with the relevant implementing organisations.	Yearly	M&E (appointed as part of the Project Coordinating Unit) and MTR Specialists.	M&E reports and consultants' reports.	Risk: Insufficient support from the beneficiary communities to implement the project successfully as benefits are not apparent immediately and only become evident in the event of floods. Assumption: Involvement in the design of project interventions and ongoing communication on the expected benefits of the activities for local communities will result in the support of the project by these communities.
Mid-term GEF Tracking Tool	N/A	N/A	baseline GEF Tracking Tool included in Annex 4	After 2nd PIR submitted to GEF (Before mid-term review mission takes place).	*For example, national university; project consultant*	US$ 10,000	

Final GEF Tracking Tool	N/A	N/A	baseline GEF Tracking Tool included in Annex 4	After final PIR submitted to GEF (Before terminal evaluation mission takes place).	*For example, national university; project consultant*	US$ 10,000	
Mid-term Review (if FSP project only)	N/A	N/A	Independent evaluators	Submitted to GEF same year as 3rd PIR (At least three months before operational closure).		US$ 35,000	Including translation costs and travel costs as necessary
Total monitoring budget						US$ 55,000	

Appendix 3: Evaluation Plan.

Evaluation Title	Planned start date Month/year	Planned end date Month/year	Included in the Country Office Evaluation Plan	Management Response	Budget for consultants[1]	Other budget (i.e. travel, site visits etc…)	Budget for translation
Mid-Term Evaluation	Between 2nd and 3rd PIR.	January 2020	Mandatory	Mandatory	US$ 35,000	Provisions made in the cost provided	US$ 5,000
Terminal Evaluation	After terminal PIR	To be submitted to GEF within three months of operational closure. April 2022	Mandatory	Mandatory	US$ 35,000	Provisions made in the cost provided	US$ 5,000
Total evaluation budget					US$ 80,000		

[1] The budget will vary depending on the number of consultants required (for full size projects should be two consultants); the number of project sites to be visited; and other travel related costs. Average # total working days per consultant not including travel is between 22-–25 working days.

Appendix 4: Tracking Tool for Climate Change Adaptation Projects.

Project Identification			
Project title:	Flood hazard and climate risk management to secure lives and assets in Mali.		
Country:	Mali	GEF Project ID:	5236
GEF Agency	UNDP	Agency Project ID:	
Executing Partners:	AEDD	Council/CEO Approval date	
Project status at submission		Tool submission date:	

Project baselines, targets and outcomes						
Objective 1: Reduce the vulnerability of people, livelihoods, physical assets and natural systems to the adverse effects of climate						
Outcome 1.2: Livelihoods and sources of income of vulnerable populations diversified and strengthened						
Indicator	**Unit of measurement**	**Baseline at CEO Endorsement**	**Target at CEO Endorsement**	**Actual at mid-term**	**Actual at completion**	**Comments (e.g. specify unit of measurement**
Indicator 2: Type and extent of assets strengthened and/or better managed to withstand the effects of climate change	Km of stormwater drains constructed	0	25			
	Km of stormwater drains rehabilitated	0	40			

Objective 2: Strengthen institutional and technical capacities for effective climate change adaptation						
Outcome 2.2: Access to improved climate information and early warning systems enhanced at regional, national, sub-national and local levels.						
Indicator	**Unit of measurement**	**Baseline at CEO Endorsement**	**Target at CEO Endorsement**	**Actual at mid-term**	**Actual at completion**	**Comments (e.g. specify unit of measurement**
Indicator 8: Number of people/ geographical area with access to improved, climate-related early warning information	Number of people	0	1,200,000			
	% female (50)	0	50			
	% of targeted area (% of total coverage of intervention sites)	0	100			
Indicator 10: Capacities	Number of institutions	3	15			

of regional, national and sub-national institutions to identify, prioritise, implement, monitor and evaluate adaptation strategies and measures.	Score	1	5			

Objective 3: Integrate climate change adaptation into relevant policies, plans and associated processes						
Outcome 3.1: Institutional arrangements to lead, coordinate and support the integration of climate change adaptation into relevant policies, plans and associated processes established and strengthened						
Indicator	**Unit of measurement**	**Baseline at CEO Endorsement**	**Target at CEO Endorsement**	**Actual at mid-term**	**Actual at completion**	**Comments (e.g. specify unit of measurement**
Indicator 13: Sub-national plans and processes developed and strengthened to identify, prioritise and integrate adaptation strategies and measures	Number of Economic, Social and Cultural Development Programme (PDESC) revised to include short- to medium-term flood risks.	0 revised	3 revised			
Indicator 13: Sub-national plans and processes developed and strengthened to identify, prioritise and integrate adaptation strategies and measures	Number of commune-specific Flood Risk Reduction Plans (FRRPs) developed in a participatory manner with local communities.	0	7			

Appendix 5: Terms of Reference for Project Coordinating Unit.

Background
The Project Coordinating Unit (PCU) will be responsible for undertaking management-related and technical decisions for the project in accordance with this ToR and providing guidance and direction for the project when required.

Tasks of the PCU will include *inter alia* approval of project plans, Annual Work Plans (AWPs) and revisions by UNDP and the AEDD. The committee will ensure a continued cohesion between the project and the mandate of the AEDD. It will also provide additional linkages and interactions with high-level policy components within the Government. The PCU will approve the responsibilities of the Project Coordinator and intervene when conflicts within the project and between project members arise.

The PCU will comprise the following members:
- AEDD (Chair);
- Mali-Météo;
- DNH;
- DGPC;
- Government representatives of municipal and village authorities from the districts of Bamako, Kayes and Mopti;
- Representatives of local communities; and
- UNDP RTA.

Scope of Work
Specific responsibilities of the PCU are as follows:
- Setting a strategic direction, reinforcing government leadership of the programme and coordinating all interventions.
- Providing guidance and agreeing on possible countermeasures/management actions to address specific risks.
- Approving the work plans prepared by the National Project Coordinator (prior to approval by UNDP).
- Conducting regular meetings to review the progress of LDCF resources and providing direction and recommendations to ensure that the agreed deliverables are produced to a satisfactory standard.
- Reviewing and approving all activities that are supported by the project based on the project objectives, work plan and availability of funding.
- Providing technical advice to create synergy and uniformity between supported activities, policies and alignment projects.
- Monitoring and evaluation of programme activities through periodic meetings and occasional site visits.
- Receiving reports on all activities supported by the programme to serve as an additional basis for monitoring and assessing LDCF resources's performance and delivery.

Terms of Reference for Project Coordinator

Scope of Work
The National Project Coordinator will be recruited by the AEDD on a full-time basis to coordinate the implementation of LDCF resources. He/she will be accountable to the National Project Director for *inter alia*: i) the quality, timeliness and effectiveness of the interventions carried out; and ii) the use of project funds[2].The Project Coordinator will report to the RTA and the PCU.

Particular responsibilities of the Project Coordinator include:

[2] The Executing Agency is also accountable for the use of LDCF project funds.

- Head the PCU.
- Report to the RTA and the PCU regarding project progress.
- Oversee and manage project implementation, monitor work progress, and ensure timely delivery of outputs in accordance with GEF and UNDP guidelines.
- Ensure timely preparation of detailed AWPs and budgets for approval by PCU.
- Ensure timely preparation of detailed AWPs and budgets for approval by PCU.
- Organise the PCU meetings.
- Deliver quarterly progress reports to the Project Board and UNDP RTA.
- Provide on-the-ground information for UNDP progress reports.
- Provide technical support to the project, including measures to address challenges to project implementation.
- Supervise, coordinate and facilitate the work of the Technical Assistants (TA), the Finance and Administration Officer, the M&E Officer, and the technical support unit (including national and international experts).
- Participate in training activities, report writing and facilitation of expert activities that are relevant to the National Coordinator's area of expertise.
- Establish linkages and networks with the ongoing activities of other government and non-government agencies.
- Liaise and coordinate with UNDP RTA on a regular basis.

Qualifications
- Master's degree in environment, DRM, or a closely related field.
- A minimum of 10 years relevant work experience including at least 6 years' experience as a lead project manager in relevant sectors.
- Demonstrated solid knowledge of adaptation to climate change, adaptation to climate change and sustainable exploitation of natural resources.
- Experience in the public participation development process associated with environment and sustainable development is an asset.
- Experience in working and collaborating within governments is an asset as well as experience in GEF projects.
- Fluent in French and English including writing and communication skills.

Reporting
The Project Coordinator will work closely with the PCU, and the UNDP RTA to ensure the availability of information on progress and performance regarding the implementation of the project. The Project Coordinator will deliver progress reports on a quarterly basis to the RTA. These reports will include: i) status of activities; and ii) challenges encountered on the ground during project execution.

Terms of Reference of the Project Financial and Administration Officer

The Finance Officer will be nationally recruited and report to the PCU. The Finance Officer will be familiar with UNDP financial administration procedures and financial reporting requirements.

Responsibilities
- Standardise the finance and accounting systems of the project while maintaining compatibility with the government and UNDPs financial accounting procedures.
- Prepare revisions of the budget and assist in the preparation of the AWPs.
- Comply and verify budget and accounting data by researching files, calculating costs and estimating anticipated expenditures from readily available information sources.
- Prepare status reports, progress reports and other financial reports.

- Process all types of payment requests for settlement purposes including quarterly advances to the partners upon joint review.
- Prepare periodic accounting records by recording receipts, disbursements (ledgers, cashbooks, vouchers, etc.) and reconciling data for recurring or financial reports and assist in preparation of annual procurement plans.
- Undertake project financial closure formalities including submission of terminal reports, transfer and disposal of equipment, processing of semi-final revisions, and support professional staff in preparing the terminal assessment reports.
- Assist in the timely issuance of contracts and assurance of other eligible entitlements of the project personnel and experts by preparing annual recruitment plans.

Qualifications
- At least a post-graduate degree in accounting, financial management or any related discipline
- A minimum of 5 years' experience in a senior finance position.
- Previous similar experiences working for International Organisations. Working for a UN agency would be an advantage.
- Experience with procurement processes is an advantage.
- Good communication and computer skills.
- Fluent in spoken and written English and French.

Terms of Reference for the Monitoring and Evaluation Officer

Scope of Work
The Monitoring and Evaluation Officer (M&E Officer) will be recruited by UNDP. She/he will be based in Bamako with regular field missions to project intervention sites. He or she will manage the UNDP reporting requirements.

Responsibilities
- Provide quality assurance and technical review of project outputs.
- Write ToRs for technical consultancies with the Project Coordinator.
- Assist in monitoring the technical quality of project (including AWPs, indicators and targets).
- Conduct the financial administrative reporting and the PIR.
- Provide advice on best suitable approaches and methodologies for achieving project targets and objectives.
- Assist in knowledge management, communications and awareness raising.
- Facilitate the development of strategic regional and international partnerships for the exchange of skills and information related to climate change adaptation.

Qualifications
- At least a BSc level in climate change adaptation or a related discipline such as disaster risk reduction, environmental management, natural resources management, agriculture, water resources management.
- A minimum of 2 years' experience in a technical lead position with planning and management of climate change adaptation and/or natural resources management programmes in developing countries.
- A minimum of 2 years in a technical position involved in institutional strengthening and capacity building.
- Previous similar experiences in provision of technical support to complex projects.
- Good communication and computer skills.
- Fluent in spoken and written English and French.

Reporting
The M&E Officer will report to the chair of the CPU. In addition, the M&E Officer will cooperate with the Project Coordinator to ensure the availability of information on progress and performance in the implementation of the project. In the performance of his/her duties, the M&E Officer will work in close collaboration with the UNDP RTA to provide updates on the project's progress.

Terms of Reference for the Technical Assistants

Three Technical Assistants will be hired to directly support the Project Coordinator with administrative tasks.

Responsibilities
- Report to the Project Coordinator
- Assist the Project Coordinator with PIRs, Project reports and the Project closure workshop.
- Assist the Project Coordinator with the preparation of visits to the project demonstration sites.
- Assist the Project Coordinator with daily administrative and logistical tasks.

Qualifications
- Bachelor degree in the field of natural resource management, environment or a related field.
- Experience working in the field of environment and sustainable development is an asset.
- Experience in working and collaborating with local authorities is an asset.
- Excellent knowledge of French and English including writing and communication skills.

General Terms of Reference for International Experts of the Support Team

Project implementation will be supported by **contractors**, selected according to UNDP procurement rules. The AEDD can contract other entities – defined as Responsible Parties – to undertake specific project tasks through a process of competitive bidding. However, if the Responsible Party is another government institution, Inter-governmental Organisation or a UN agency, competitive bidding will not be necessary and direct contracting will be applied. Confirmation of direct contracting will need to comply with comparative advantage, timing, budgeting and quality criteria. If direct contracting criteria cannot be met the activity will be open to competitive bidding.

The international experts will be hired to perform the following tasks:
- Collect data.
- Provide advice relevant to their field.
- Monitor interventions.

Additionally, the international consultants must be experts in their field. In addition, the international experts should have good knowledge and understanding of Mali's climate change risks. They should have an appropriate MSc degree and a minimum of 5 years' experience or an appropriate bachelor's degree and 10 years' experience in their field of expertise. Fluency in spoken and written English and French is required.

General Terms of Reference for National Experts of the Support Team

Local expertise will be sourced where possible in place of international expertise in order to strengthen in-country capacity. National experts will be hired by the project to:
- Collect data.

- Provide advice relevant to their field.
- Monitor interventions.

Additionally, the national experts must be experts in their field. Additionally, they should have good knowledge and understanding of Mali's climate change vulnerability and an appropriate MSc degree and a minimum of 5 years' experience or an appropriate bachelor's degree and 10 years' experience in their field of expertise. National experts need to be fluent in spoken and written English and French.

The hiring procedures to be followed for both international and national experts must include a transparent and competitive process based on normal UNDP procedures.

Appendix 6: Social and Environmental Screening Template.

Social and Environmental Screening Template

The completed template, which constitutes the Social and Environmental Screening Report, must be included as an annex to the Project Document. Please refer to the Social and Environmental Screening Procedure for guidance on how to answer the 6 questions.]

Project Information

Project Information	
1. Project Title	Flood hazard and climate risk management to secure lives and assets in Mali.
2. Project Number	5236
3. Location (Global/Region/Country)	Republic of Mali

Part A. Integrating Overarching Principles to Strengthen Social and Environmental Sustainability

QUESTION 1: How Does the Project Integrate the Overarching Principles in order to Strengthen Social and Environmental Sustainability?
Briefly describe in the space below how the Project mainstreams the human-rights based approach
The objective of the LDCF-financed project is to increase the capacity of national and local government authorities to manage flood risks and hazards in Mali. The implementation of the project's activities will support securing the lives and protecting physical assets in the intervention sites. Because of the nature of the LDCF-financed project, a human-rights based approach is foundational. Importantly, the project's interventions will be implemented to contribute to securing the lives of ~1,200,000 by developing an Early Warning System (EWS) and several other flood risk reduction measures including *inter alia* permeable rock dams and the improvement of stormwater drainage. In addition, the human rights based approach promotes flood-resilient local economic development. For example, short- to medium-term flood risks will be mainstreamed into the existing Economic, Social and Cultural Development Programmes (PDESCs) for the respective districts to guide local development planning. The project interventions have been developed in accordance with internationally proclaimed human rights, in conformity with UN guidelines. To ensure that no rights or laws are infringed by the proposed interventions, these interventions were developed in consultation with representatives from several ministries. Extensive consultations were also held with the beneficiary local communities to ensure that the LDCF-financed project responds to their needs for flood risk management.
Briefly describe in the space below how the Project is likely to improve gender equality and women's empowerment
The outcomes of the LDCF-financed project will increase the technical, institutional and financial capacities of national and local government authorities to develop and implement flood risk reduction interventions. A gender-sensitive and gender-responsive approach has been adopted in the design of the project and will be supported during implementation phase. By promoting such an approach, the adaptive capacity and empowerment of women will be enhanced within the intervention sites. During the implementation phase of the project's interventions, particular

attention will be given to addressing the limited adaptive capacity and vulnerability of women to floods. For example, gender considerations will be mainstreamed in the flood risks and hazards communication strategy developed under Output 1.2. In particular, the LDCF-financed project will focus on empowering women through promoting their participation in decision-making processes and in accessing LDCF funds. A gender specialist will be appointed to assess the project's interventions and provide a roadmap for promoting a gender-responsive approach in the implementation of the interventions financed by the LDCF. Corrective action will be recommended to increase gender considerations in the design of, and the benefits expected from the project's interventions. Moreover, gender-disaggregated indicators have been included in the Results Framework (see Section V of the project document) and additional indicators will be developed by the appointed gender specialist. The effects of climate change are often more notable for women than men. For example, as women's domestic life in Mali pertains to raising children, water collection and wood harvesting, they become more burdened than men in the event of floods. Women have to walk longer distances to access potable water and attend to children who become susceptible to water- and vector-borne diseases, such as cholera and malaria, after floods. By increasing the adaptive capacity of women in the intervention sites – through EWS and other flood risk reduction interventions – the burden on women in the intervention sites will be reduced.
Briefly describe in the space below how the Project mainstreams environmental sustainability
The following interventions mainstream environmental sustainability into the LDCF-financed project: i) awareness-raising campaigns for local communities on appropriate solid waste disposal practices; ii) rehabilitation of stormwater drains; and iii) rehabilitation of wetlands to improve water infiltration. In addition, EIAs will be undertaken prior to the construction of all hard infrastructure under the LDCF-financed project. The necessary corrective actions will be implemented based on the recommendations of the EIAs to limit or minimise any negative effects on the environment.

Part B. Identifying and Managing Social and Environmental Risks

QUESTION 2: What are the Potential Social and Environmental Risks? *Note: Describe briefly potential social and environmental risks identified in Attachment 1 – Risk Screening Checklist (based on any "Yes" responses).*	**QUESTION 3: What is the level of significance of the potential social and environmental risks?** *Note: Respond to Questions 4 and 5 below before proceeding to Question 6*			**QUESTION 6: What social and environmental assessment and management measures have been conducted and/or are required to address potential risks (for Risks with Moderate and High Significance)?**
Risk Description	***Impact and Probability (1-5)***	***Significance (Low, Moderate, High)***	***Comments***	***Description of assessment and management measures as reflected in the Project design. If ESIA or SESA is required note that the assessment should consider all potential impacts and risks.***
Risk 4: Duty-bearers do not have the capacity to meet their obligations in	I = 2	**Low**	The LDCF-financed project is a country-driven initiative. Therefore,	To address this challenge, training workshops will be held with national and

the Project.	P = 2		Malian stakeholders – including government and local communities – will be the ultimate duty-bearers. It is challenging at PPG stage to predict that the capacity of all duty-bearers will be sufficient to implement the project's interventions as detailed in the project document.	local government authorities to increase their understanding and expertise of the technical interventions.
Risk 2.2: Potential outcomes of the Project be sensitive or vulnerable to potential impacts of climate change.	I = 3 P = 3	**Moderate**	Under Outcome 3 of the LDCF-financed project, several soft and hard interventions will be implemented to reduce flood risks at the intervention sites. These interventions could be compromised by the predicted effects of climate change in Mali. For example, the revegetation of the riparian areas of wetlands could be compromised (under Output 3.1.) by floods during the planting stage.	Current and future climatic variability will be taken into account when planning and implementing interventions. For example, climate-resilient plant species will be selected under Outcome 3.1. for the rehabilitation of riparian areas of wetlands.
Risk 3.4: Failure of structural elements of the Project pose risks to communities? (e.g. collapse of buildings or infrastructure)	I = 4 P = 1	**Low**	Under Component 3, several hard interventions are proposed. These include permeable rock dams, a network of canals and stormwater drains. The failure of these structures as a result of poor structural planning or minimal long-term maintenance would result in exposing local communities to floods.	Environmental Impact Assessments (EIAs) will be conducted to evaluate the possible negative impacts of the infrastructures. Based on this assessments, measures will be taken and planned to prevent these risks to occur.

	• **QUESTION 4: What is the overall Project risk categorization?**		
	Select one (see SESP for guidance)		**Comments**
	Low Risk	**x**	Three risks have been identified – two are of low significance and one is of moderate significance.

	Moderate Risk		
	High Risk		
	QUESTION 5: Based on the identified risks and risk categorization, what requirements of the SES are relevant?		
	Check all that apply		**Comments**
	Principle 1: Human Rights	**x**	1 risk identified
	Principle 2: Gender Equality and Women's Empowerment	☐	
	1. Biodiversity Conservation and Natural Resource Management	☐	
	2.Climate Change Mitigation and Adaptation	**x**	1 risk identified
	3.Community Health, Safety and Working Conditions	**x**	1 risk identified
	4.Cultural Heritage	☐	
	5.Displacement and Resettlement	☐	
	6.Indigenous Peoples	☐	
	7.Pollution Prevention and Resource Efficiency	☐	

Final Sign Off

Signature	***Date***	***Description***
QA Assessor		UNDP staff member responsible for the Project, typically a UNDP Programme Officer. Final signature confirms they have "checked" to ensure that the SESP is adequately conducted.
QA Approver		UNDP senior manager, typically the UNDP Deputy Country Director (DCD), Country Director (CD)**,** Deputy Resident Representative (DRR), or Resident Representative (RR). The QA Approver cannot also be the QA Assessor. Final signature confirms they have "cleared" the SESP prior to submittal to the PAC.
PAC Chair		UNDP chair of the PAC. In some cases PAC Chair may also be the QA Approver. Final signature confirms that the SESP was considered as part of the project appraisal and considered in recommendations of the PAC.

SESP Attachment 1. Social and Environmental Risk Screening Checklist

Checklist Potential Social and Environmental Risks	
Principles 1: Human Rights	**Answer (Yes/ No)**
1. Could the Project lead to adverse impacts on enjoyment of the human rights (civil, political, economic, social or cultural) of the affected population and particularly of marginalized groups?	No
2. Is there a likelihood that the Project would have inequitable or discriminatory adverse impacts on affected populations, particularly people living in poverty or marginalized or excluded individuals or groups? [3]	No
3. Could the Project potentially restrict availability, quality of and access to resources or basic services, in particular to marginalized individuals or groups?	No
4. Is there a likelihood that the Project would exclude any potentially affected stakeholders, in particular marginalized groups, from fully participating in decisions that may affect them?	No
5. Are there measures or mechanisms in place to respond to local community grievances?	No
6. Is there a risk that duty-bearers do not have the capacity to meet their obligations in the Project?	Yes
7. Is there a risk that rights-holders do not have the capacity to claim their rights?	No
8. Have local communities or individuals, given the opportunity, raised human rights concerns regarding the Project during the stakeholder engagement process?	No
9. Is there a risk that the Project would exacerbate conflicts among and/or the risk of violence to project-affected communities and individuals?	No
Principle 2: Gender Equality and Women's Empowerment	
1. Is there a likelihood that the proposed Project would have adverse impacts on gender equality and/or the situation of women and girls?	No
2. Would the Project potentially reproduce discriminations against women based on gender, especially regarding participation in design and implementation or access to opportunities and benefits?	No
3. Have women's groups/leaders raised gender equality concerns regarding the Project during the stakeholder engagement process and has this been included in the overall Project proposal and in the risk assessment?	No
3. Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and positions of women and men in accessing environmental goods and services? *For example, activities that could lead to natural resources degradation or depletion in communities who depend on these resources for their livelihoods and well being*	No
Principle 3: Environmental Sustainability: Screening questions regarding environmental risks are encompassed by the specific Standard-related questions below	
Standard 1: Biodiversity Conservation and Sustainable Natural Resource Management	
1.1 Would the Project potentially cause adverse impacts to habitats (e.g. modified, natural, and critical habitats) and/or ecosystems and ecosystem services? *For example, through habitat loss, conversion or degradation, fragmentation, hydrological changes*	No

[3] Prohibited grounds of discrimination include race, ethnicity, gender, age, language, disability, sexual orientation, religion, political or other opinion, national or social or geographical origin, property, birth or other status including as an indigenous person or as a member of a minority. References to "women and men" or similar is understood to include women and men, boys and girls, and other groups discriminated against based on their gender identities, such as transgender people and transsexuals.

1.2 Are any Project activities proposed within or adjacent to critical habitats and/or environmentally sensitive areas, including legally protected areas (e.g. nature reserve, national park), areas proposed for protection, or recognized as such by authoritative sources and/or indigenous peoples or local communities?	No
1.3 Does the Project involve changes to the use of lands and resources that may have adverse impacts on habitats, ecosystems, and/or livelihoods? (Note: if restrictions and/or limitations of access to lands would apply, refer to Standard 5)	No
1.4 Would Project activities pose risks to endangered species?	No
1.5 Would the Project pose a risk of introducing invasive alien species?	No
1.6 Does the Project involve harvesting of natural forests, plantation development, or reforestation?	No
1.7 Does the Project involve the production and/or harvesting of fish populations or other aquatic species?	No
1.8 Does the Project involve significant extraction, diversion or containment of surface or ground water? *For example, construction of dams, reservoirs, river basin developments, groundwater extraction*	No
1.9 Does the Project involve utilization of genetic resources? (e.g. collection and/or harvesting, commercial development)	No
1.10 Would the Project generate potential adverse transboundary or global environmental concerns?	No
1.11 Would the Project result in secondary or consequential development activities which could lead to adverse social and environmental effects, or would it generate cumulative impacts with other known existing or planned activities in the area? *For example, a new road through forested lands will generate direct environmental and social impacts (e.g. felling of trees, earthworks, potential relocation of inhabitants). The new road may also facilitate encroachment on lands by illegal settlers or generate unplanned commercial development along the route, potentially in sensitive areas. These are indirect, secondary, or induced impacts that need to be considered. Also, if similar developments in the same forested area are planned, then cumulative impacts of multiple activities (even if not part of the same Project) need to be considered.*	No
Standard 2: Climate Change Mitigation and Adaptation	
2.1 Will the proposed Project result in significant[4] greenhouse gas emissions or may exacerbate climate change?	No
2.2 Would the potential outcomes of the Project be sensitive or vulnerable to potential impacts of climate change?	Yes
2.3 Is the proposed Project likely to directly or indirectly increase social and environmental vulnerability to climate change now or in the future (also known as maladaptive practices)? *For example, changes to land use planning may encourage further development of floodplains, potentially increasing the population's vulnerability to climate change, specifically flooding*	No
Standard 3: Community Health, Safety and Working Conditions	
3.1 Would elements of Project construction, operation, or decommissioning pose potential safety risks to local communities?	No
3.2 Would the Project pose potential risks to community health and safety due to the transport, storage, and use and/or disposal of hazardous or dangerous materials (e.g. explosives, fuel and other chemicals during construction and operation)?	No
3.3 Does the Project involve large-scale infrastructure development (e.g. dams, roads,	No

[4] In regards to CO_2, 'significant emissions' corresponds generally to more than 25,000 tons per year (from both direct and indirect sources). [The Guidance Note on Climate Change Mitigation and Adaptation provides additional information on GHG emissions.]

buildings)?	
3.4 Would failure of structural elements of the Project pose risks to communities? (e.g. collapse of buildings or infrastructure)	Yes
3.5 Would the proposed Project be susceptible to or lead to increased vulnerability to earthquakes, subsidence, landslides, erosion, flooding or extreme climatic conditions?	No
3.6 Would the Project result in potential increased health risks (e.g. from water-borne or other vector-borne diseases or communicable infections such as HIV/AIDS)?	No
3.7 Does the Project pose potential risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during Project construction, operation, or decommissioning?	No
3.8 Does the Project involve support for employment or livelihoods that may fail to comply with national and international labor standards (i.e. principles and standards of ILO fundamental conventions)?	No
3.9 Does the Project engage security personnel that may pose a potential risk to health and safety of communities and/or individuals (e.g. due to a lack of adequate training or accountability)?	No
Standard 4: Cultural Heritage	
4.1 Will the proposed Project result in interventions that would potentially adversely impact sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g. knowledge, innovations, practices)? (Note: Projects intended to protect and conserve Cultural Heritage may also have inadvertent adverse impacts)	No
4.2 Does the Project propose utilizing tangible and/or intangible forms of cultural heritage for commercial or other purposes?	No
Standard 5: Displacement and Resettlement	
5.1 Would the Project potentially involve temporary or permanent and full or partial physical displacement?	No
5.2 Would the Project possibly result in economic displacement (e.g. loss of assets or access to resources due to land acquisition or access restrictions – even in the absence of physical relocation)?	No
5.3 Is there a risk that the Project would lead to forced evictions?[5]	No
5.4 Would the proposed Project possibly affect land tenure arrangements and/or community based property rights/customary rights to land, territories and/or resources?	No
Standard 6: Indigenous Peoples	
6.1 Are indigenous peoples present in the Project area (including Project area of influence)?	No
6.2 Is it likely that the Project or portions of the Project will be located on lands and territories claimed by indigenous peoples?	No
6.3 Would the proposed Project potentially affect the rights, lands and territories of indigenous peoples (regardless of whether Indigenous Peoples possess the legal titles to such areas)?	No
6.4 Has there been an absence of culturally appropriate consultations carried out with the objective of achieving FPIC on matters that may affect the rights and interests, lands, resources, territories and traditional livelihoods of the indigenous peoples concerned?	No
6.4 Does the proposed Project involve the utilization and/or commercial development of natural resources on lands and territories claimed by indigenous peoples?	No
6.5 Is there a potential for forced eviction or the whole or partial physical or economic displacement of indigenous peoples, including through access restrictions to lands, territories,	No

[5] Forced evictions include acts and/or omissions involving the coerced or involuntary displacement of individuals, groups, or communities from homes and/or lands and common property resources that were occupied or depended upon, thus eliminating the ability of an individual, group, or community to reside or work in a particular dwelling, residence, or location without the provision of, and access to, appropriate forms of legal or other protections.

and resources?	
6.6 Would the Project adversely affect the development priorities of indigenous peoples as defined by them?	No
6.7 Would the Project potentially affect the traditional livelihoods, physical and cultural survival of indigenous peoples?	No
6.8 Would the Project potentially affect the Cultural Heritage of indigenous peoples, including through the commercialization or use of their traditional knowledge and practices?	No
Standard 7: Pollution Prevention and Resource Efficiency	
7.1 Would the Project potentially result in the release of pollutants to the environment due to routine or non-routine circumstances with the potential for adverse local, regional, and/or transboundary impacts?	No
7.2 Would the proposed Project potentially result in the generation of waste (both hazardous and non-hazardous)?	No
7.3 Will the proposed Project potentially involve the manufacture, trade, release, and/or use of hazardous chemicals and/or materials? Does the Project propose use of chemicals or materials subject to international bans or phase-outs? *For example, DDT, PCBs and other chemicals listed in international conventions such as the Stockholm Conventions on Persistent Organic Pollutants or the Montreal Protocol*	No
7.4 Will the proposed Project involve the application of pesticides that may have a negative effect on the environment or human health?	No
7.5 Does the Project include activities that require significant consumption of raw materials, energy, and/or water?	No

Appendix 7: Co-financing Letters.

MINISTERE DE L'ÉQUIPEMENT,
DES TRANSPORTS ET DU
DESENCLAVEMENT

SECRETARIAT GENERAL

AGENCE NATIONALE DE LA
MÉTÉOROLOGIE
Tél : (223) 20 20 62 04
Fax : (223) 20 20 21 10
Email : dnm@afribonemali.net

RÉPUBLIQUE DU MALI
Un Peuple – Un But – Une Foi

Bamako, le 28 JAN 2016

N°2016/000023/MALI-METEO/DG

Monsieur le Directeur Général de
l'Agence Nationale de la Météorologie

À

Monsieur le Directeur Pays
PNUD au Mali

Objet: Lettre de cofinancement du projet « *Flood hazard and Climate risk management to secure lives and assets in Mali"*

Monsieur le Directeur,

L'Agence Nationale de la Météorologie (MALI-METEO) a pour mission fondamentale de contribuer à assurer la sécurité des personnes et des biens par la fourniture des informations météorologiques et climatologiques appropriées à tous les usagers pour les prises de décisions. Dans ce contexte MALI-METEO a développé beaucoup d'activités d'assistance météorologiques et climatologiques, notamment dans le cadre des changements climatiques ainsi que l'amélioration de la prévision météorologique. On peut citer entre autres les actions d'assistance météorologiques au monde rural ; les actions d'alertes précoces, les actions de transfert de technologies pour l'adaptation et l'atténuation.
Le Gouvernement du Mali a depuis quelques entamé des actions de renforcement de capacité de MALI-METEO à travers le renforcement et de la réhabilitation du réseau d'observations météorologiques, ainsi qu'un vaste programme de pluies proposées afin de développer de meilleures produits météorologiques et d'assister les usagers pour réduire les risques de catastrophes.

Le projet ci-dessus cité relatif à la gestion des risques d'inondation au Mali, notamment dans les trois régions Kayes, Bamako et Mopti s'inscrit parfaitement dans ce contexte des missions de MALI-METEO. Ce projet va permettre de renforcer le réseau de collecte dans ces régions, mais aussi de renforcer les prévisions météorologiques d'alerte destinées aux décideurs et au public pour éviter les cas malheureux d'inondation constatés les années précédentes notamment à Bamako.

MALI-METEO en tant que acteur et bénéficiaire du projet est heureux d'appuyer ledit projet par la mise en œuvre de ses programmes annuels sous forme de co-financement d'un **montant global annuel** de 2.469.000.000FCFA (**4.938.000US**) reparti comme suit :

- Cout annuel de réhabilitation et de renforcement du réseau d'observations météorologiques.....249.000.0000FCFA
- Cout annuel de programme de pluies provoquées.....2.000.000.000FCFA
- Cout annuel d'assistance météorologique au monde rural.....71.000.000FCFA
- Centre de prévisions climatiques.....149.000.000FCFA

La mise en œuvre de cet important projet pour la République de Mali reste vivement attendue dans les plus brefs délais.
Veuillez agréer, Monsieur le Directeur, l'expression de ma considération distinguée.

Le Directeur Général

Djibrilla A. MAIGA
Chevalier de l'Ordre National

MINISTÈRE DE L'EQUIPEMENT DES TRANSPORTS ET DU DÉSENCLAVEMENT
Agence Nationale de la Météorologie
République du Mali
UN PEUPLE UN BUT UNE FOI

Au service
des peuples
et des nations

Bamako, le 26 Janvier 2016

PNUD-FEM/002/2016

Madame la Directrice,

Objet : Lettre de cofinancement du projet « Gestion des risques climatiques et d''inondations en vue de préserver des vies et des biens au Mali"

Le projet représente une opportunité pour le PNUD d'appuyer le Mali dans sa réponse actuelle face aux changements climatiques, de contribuer à une plus grande résilience des efforts de développement actuellement mis en œuvre et de développer une économie plus résiliente. Ce projet s'inscrit parfaitement dans le cadre des objectifs du Document de Programme Pays (CPD) 2015 - 2019 du PNUD et de l'UNDAF+ à travers l'Effet : Les populations vulnérables, particulièrement les femmes et les jeunes, bénéficient de capacités productives dans un environnement (naturel) sain favorable à la réduction de la pauvreté ainsi que des produits 4 et 6 de l'effet 1 du Plans Stratégiques 2014-2017 du PNUD: La croissance et le développement sont inclusifs et durables, générant les capacités de production nécessaires pour créer des emplois et des moyens d'existence pour les pauvres et les exclus.

Dr. Naoko Ishii
Directrice et Président
Fonds pour l'Environnement Mondial
1818 H Street, NW, Mail Stop P4-400
Washington, DC 20433 USA

... /...

Produit 4 : Les groupes vulnérables (jeunes, femmes, déplacés…) mettent en œuvre des activités d'adaptation et de résilience au climat contribuant à la revitalisation des économies locales.

Produit 6 : L'Etat et les collectivités territoriales mettent en œuvre leurs plans d'actions permettant de réduire les risques de catastrophes et d'améliorer l'assainissement. D'autre part, l'objectif et les résultats recherchés, ainsi que les activités qui seront appuyées par le projet de gestion des risques climatiques et d'inondations au Mali sont tout à fait complémentaires aux objectifs du programme d'Appui à la mise en œuvre de la Stratégie nationale sur les changements climatiques, financé par le Ministère Allemand en charge de l'Environnement (BMU) à hauteur de 6 millions USD et mis en œuvre à travers le PNUD. Il vise entre autres à améliorer la fourniture de données hydrométéorologiques en vue de fournir des outils d'aide à la décision y compris la prévention et l'alerte aux inondations sur l'ensemble du territoire national. Les deux projets vont améliorer les capacités techniques des services décentralisées & des organisations de producteurs, spécifiquement les femmes, pour l'adoption de mesures et de techniques/technologies d'adaptation aux risques climatiques et d'inondations.

Enfin, j'atteste par la présente que le PNUD mettra à disposition de ce projet un financement additionnel de 800,000 USD pour la durée du projet, correspondant à la contribution financière directe du PNUD à sa bonne mise en œuvre. Par conséquent, en ma qualité de Directeur Pays du Bureau PNUD au Mali, je marque mon accord pour qu'un montant de 6, 800,000 USD soit considéré comme cofinancement au projet cité en objet, dont 6 millions de USD associés à la mise en œuvre du projet d'appui à la mise en œuvre de la Stratégie Nationale en matière de changements climatiques comme cofinancement parallèle et 800,000 USD comme cofinancement en espèce.

Veuillez agréer, Madame la Directrice, l'expression de ma considération distinguée.

REPRESENTANT RESIDENT DU PROGRAMME DES NATIONS UNIES POUR LE DEVELOPMENT AU MALI

Boubou Dramane CAMARA

Directeur Pays

MINISTERE DE L'ENVIRONNEMENT,
DE L'ASSAINISSEMENT ET
DEVELOPPEMENT DURABLE

DIRECTION NATIONALE DE L'ASSAINISSEMENT ET
DU CONTROLE DES POLLUTIONS ET DES NUISANCES

REPUBLIQUE DU MALI
UN PEUPLE - UN BUT - UNE FOI

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02 FEV 2016

Bamako, le_____

Le Directeur National de l'Assainissement et du Contrôle et des Nuisances

A

Monsieur le Directeur
Pays PNUD au Mali

N° 0069 MEADD-DNACPN

Objet : Lettre de cofinancement du projet « Gestion et risques climatiques et d'inondations au Mali pour sécuriser des vies et des biens »

Monsieur le Directeur,

La Direction Nationale de l'Assainissement et du Contrôle des Pollutions et Nuisances (DNACPN) est responsable de la mise en œuvre de la politique nationale de l'assainissement (PNA).

Elle a pour mission l'élaboration des éléments de la politique nationale en matière d'assainissement et du contrôle des pollutions et des nuisances et d'en assurer l'exécution.

A ce titre, elle est chargée de :

- suivre et veiller à la prise en compte, par les politiques sectorielles et les plans et programmes de développement, des questions environnementales et à la mise en œuvre des mesures arrêtées en la matière ;
- assurer la supervision et le contrôle technique des procédures d'études d'impact sur l'Environnement (EIE) ;
- élaborer et veiller au respect des normes nationales en matière d'assainissement, de pollutions et de nuisances ;
- assurer le contrôle et le respect de la législation et des normes en matière d'assainissement, de pollutions et de nuisances ;
- assurer la formation, l'information et la sensibilisation des citoyens sur les problèmes d'insalubrité, de pollutions et de nuisances en rapport avec les structures concernées, les Collectivités Territoriales et la société civile ;
- assurer, en rapport avec les structures concernées, le suivi de la situation environnementale du pays.

La ville de Bamako au Mali, connait depuis de nombreuses années des problèmes récurrents d'inondations dans certains quartiers. La configuration même de la ville, située dans une cuvette relativement plate entourée de collines et traversée par le fleuve Niger vers lequel converge de

nombreux affluents sur les bassins versants desquels l'urbanisation s'est développée, fait de Bamako une zone propice aux inondations.

La vulnérabilité de la ville vis-à-vis des inondations est également accentuée par les capacités limitées de son réseau de drainage des eaux pluviales et les changements climatiques à l'œuvre dans la région. La vétusté, le manque d'entretien et de maintenance et parfois même la mauvaise conception de certaines parties du réseau sont autant d'éléments qui réduisent sa capacité d'évacuation des eaux. Enfin les rejets d'ordures et de déchets solides de nature diverses dans les collecteurs réduit également leur capacité de drainage.

Afin de réduire les risques d'inondation de la population de Bamako, la République du Mali et la République Fédérale d'Allemagne ont convenu d'appuyer l'aménagement de zones considérées comme très vulnérables aux inondations, à savoir le Marigot Tienkolé dans la commune I et le marigot Ouéouyankou de la commune IV à travers le projet « Drainage des Eaux Pluviales à Bamako ».
La réalisation du Projet est du ressort du Ministère de l'Environnement, de l'Assainissement et du Développement Durable. Sous sa tutelle, la Direction Nationale de l'Assainissement et du Contrôle des Pollutions et des Nuisances (« DNACPN ») sera responsable de la réalisation du Projet en tant que Maître d'Ouvrage Délégué.

L'objectif global du projet est de contribuer à l'amélioration du cadre de vie des populations, notamment celles vivants aux abords des zones inondables, et à la diminution des risques d'origine hydrique, particulièrement pour les populations les plus pauvres

Le coût estimé du Projet au moment de l'évaluation ("Coût global") s'élève à 10,9 millions d'euros correspondant à 7,15 milliards de FCFA soit environ 12 327 411 Dollars US. Ce projet est conjointement financé par le Gouvernement du Mali et la République Fédérale d'Allemagne. Sa durée est de 03 (trois) ans.

Par ailleurs, la DNACPN conduit avec l'AGETIPE et CIRA sa une étude de collecte et de traitement des eaux usées et déchets solides dans onze villes à l'intérieur du pays (Kayes, Koulikoro, Kati, Sikasso, Koutiala, Gao, Kidal, Ségou, Niono, Mopti, et Tombouctou). Ce projet est entièrement financé par le Gouvernement du Mali pour un montant de 2 859 108 000 F CFA soit environ 4 929 496 Dollars US.

Je marque par conséquent mon accord pour qu'un montant de 17 256 907 USD, soit considéré comme **cofinancement parallèle** au projet PNUD/FEM mentionné plus-haut.

Veuillez agréer, Monsieur le Directeur Pays, l'expression de ma considération distinguée.

Mahamadou KAYA
Ingénieur Sanitaire

Direction Nationale de l'Assainissement et du Contrôle des Pollutions et des Nuisances
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MINISTERE DE L'ENVIRONNEMENT, DE L'ASSAINISSEMENT ET DU DEVELOPPEMENT DURABLE

Agence de l'Environnement et du Développement Durable (AEDD)

REPUBLIQUE DU MALI
Un Peuple - Un But- Une Foi

Bamako, le 11 MARS 2016

Le Directeur Général de l'Agence de l'Environnement et du Développement Durable

N° 0324 /MEADD/AEDD.

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Monsieur le Directeur Pays du PNUD au Mali

Objet : Lettre de cofinancement du projet « Gestion des risques climatiques et d'inondations au Mali en vue de sécuriser des vies et des biens".

Monsieur le Directeur,

L'Agence de l'Environnement et du Développement Durable (AEDD) est responsable de la coordination et l'intégration des aspects climatiques et environnementaux dans la politique d'autres secteurs. Elle a le mandat d'assurer la coordination de la mise en œuvre de la Politique Nationale pour la Protection de l'Environnement (PNPE) et de promouvoir le développement durable par l'intégration de la dimension environnementale dans les politiques, programmes et projets de développement. Dans le cadre de la mise en œuvre du projet mentionne ci-dessus, l'AEDD jouera un rôle central au niveau de la supervision du projet, du renforcement des capacités des autorités locales, communautés et services déconcentrés et de la coordination des différents intervenant issus des Directions relevant d'autres Ministères (Agriculture, Eau, Transports, Femmes, etc.) ou agences spécialisées du Gouvernement (Commissariat a la Sécurité Alimentaire).

Le Programme d'Appui à la Gestion de l'Environnement et la Promotion du Développement Durable au Mali (PAGEDD) a pour ambition de faire la promotion du Développement Durable et à une meilleure prise en compte de l'environnement en général et des changements climatiques en particulier dans les Politiques, Programmes et Projets de développement. Le projet intervient sur l'ensemble du territoire national et le PNUD apporte un cofinancement parallèle de **2 millions USD.** Les deux projets vont travailler ensemble pour mieux coordonner les efforts de lutte contre les changements climatiques et renforcer les capacités des communautés cibles dans les 2 régions (Kayes et Mopti) et le District de Bamako pour la gouvernance des changements climatiques.

Par ailleurs, l'AEDD en tant agence d'exécution nationale dudit projet, mettra à la disposition du projet des locaux. A ce titre, la contribution de l'AEDD, en termes de cofinancement, se chiffre à **500 mille USD** pour toute la durée du projet. Ce montant représente le salaire du point focal du bureau, l'eau et l'électricité et autres facilités.

En plus, le Gouvernement du Mali apportera une contribution **en espèce de 500 mille USD** repartie sur la durée du projet.

Je marque par conséquent mon accord pour qu'un montant de **3 millions USD**, associés à la mise en œuvre du projet ci-dessus mentionné, soit considéré comme **cofinancement** au projet PNUD/FEM mentionné plus-haut **dont 2,5 millions en cofinancement parallèle et 500 mille USD** en cofinancement en espèce.

Veuillez agréer, Monsieur le Directeur Pays, l'expression de ma considération distinguée.

LE DIRECTEUR GENERAL

Le Directeur Général

Aboubacar DIABATE
Ingénieur d'Agriculture et du Génie Rural

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Appendix 8: Alignment with Policies.

The LDCF-financed project has been designed to respond to Mali's national priorities and will support the implementation of national policies, plans and strategies. In addition to the national priorities as detailed in policies, plans and strategies, the project's activities are well-aligned with the GEF-LDCF and UNDP strategic objectives.

Policy conformity

The management of climate risks and floods in particular is addressed in Axis 2 of the **Poverty Reduction and Growth Strategy Paper** (CSCRP, 2012-2017). This axis, entitled "Strengthening long-term basis for development and equitable access to quality social services", aims to develop human resources while simultaneously addressing gender inequalities, access to basic social services and the preservation of the environment in the context of climate change.

The **National Plan for Multi Risk Preparation and Emergency Disaster Response** (PNMRRC) was developed to increase the speed of responses in the event of natural disaster events, including the release of emergency funding. The main objectives of the plan are to: i) facilitate the coordination of disaster prevention and management actions and enable the coherence of sectoral plans; ii) clarify the relationships/responsibilities between participating government agencies and humanitarian partners; iii) identify and address the most probable risks of natural disasters; iv) integrate protocols for disaster/emergency response measures into sectoral plans and development programmes; and v) reduce the time taken to respond to crises. In line with the ongoing activities of the PNMRRC, the LDCF-financed project will generate recommendations for policy reforms to manage settlements in flood-prone areas thereby reducing exposure to flood risks. Policy reforms will pertain to existing building, and settlement codes and the associated land-use plans which will inform future development planning. Managing settlements will consist of developing and implementing the necessary interventions – including both soft and hard – to reduce flood risks in flood-prone areas. In addition, the project will develop innovative financial strategies to increase the availability and speed of the release of funds to support relief efforts in the event of climate-related hazards such as floods.

Although the **National Adaptation Programme of Action** (NAPA) recognises floods as the third most important climatic risk – after droughts and strong winds – in the country, there are no NAPA priority developed to specifically address floods. However, the LDCF-financed project supports the implementation of some priorities in Mali's NAPA that can contribute to flood management. LDCF financed will be used to contribute to NAPA priorities 12 and 16. NAPA priority 12 is entitled "Awareness and organisation of populations to preserve local natural resources through the development of local conventions and regulations". The project will support the preservation and restoration of riparian areas of wetlands to increase groundwater infiltration and reduce soil erosion, which would in turn reduce flood risks. This will be achieved through the rehabilitation of riparian areas of wetlands in the intervention sites. NAPA priority 16 is entitled "Communication with the people on the effects of climate change through the adoption of positive behaviours for adaptation." In line with this NAPA priority, the project will raise public awareness on the proposed EWS and the appropriate solid waste disposal practices. Educational tools will also be developed for schools to build a culture of safety in Mali and decrease the vulnerability of children to floods.

LDCF conformity

This project is consistent with the strategic objectives of the LDCF, which are to: i) reduce vulnerability to the adverse effects of climate change; ii) increase the adaptive capacity to respond to the effects of climate change; and iii) promote the transfer and adoption of adaptation technologies. This project is in alignment with these LDCF objectives in that it will: i) increase the capacity of the GoM and local government authorities to effectively plan

and implement DRM activities to decrease the vulnerability of communities that are at risk of climate-related hazards and natural disasters such as floods; ii) undertake a policy reform to support the integration of the predicted effects of climate change into existing development and planning policies, plans and strategies; and iii) implement on-the-ground flood protection measures including *inter alia* dykes, levees and floodwalls in pilot sites within Bamako, Kayes and Mopti.

Alignment with the objectives of UNDP

The LDCF-financed project's activities support the implementation of Outcome 3 of UNDP's Strategic Plan, which is "Resilience-building by facilitating the integration of disaster risk reduction with adaptation to climate change and addressing differentiated social and economic impacts; and preparedness for disaster management and recovery at the sub-national and national levels". This project will also support the Common Framework in Support to the Transition (CCAT) that was developed to strengthen UN operational activities in Mali following political instability in 2012.

Appendix 9: Problem Trees.

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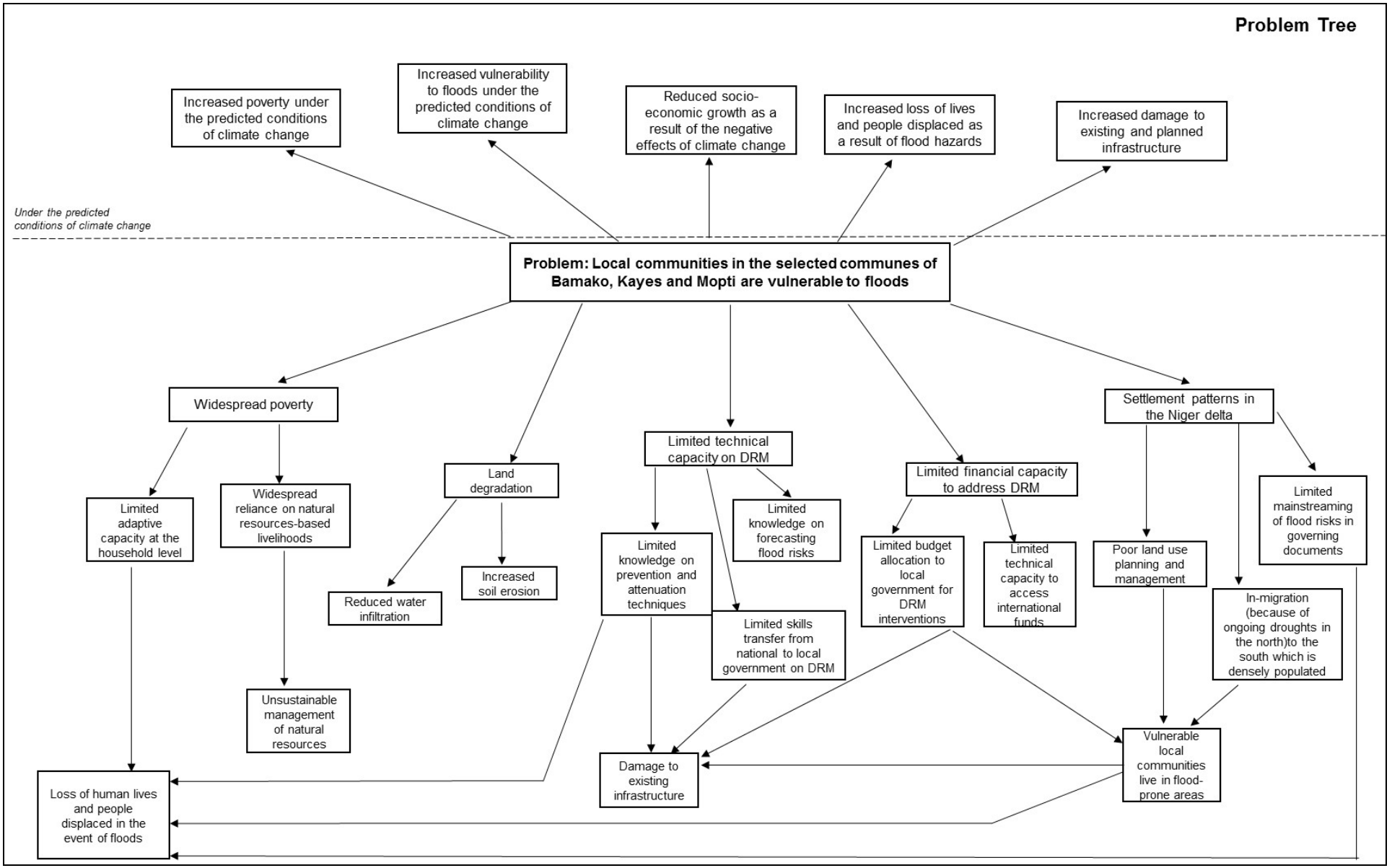
Problem Tree
Increased poverty under the predicted conditions of climate change
Increased vulnerability to floods under the predicted conditions of climate change
Reduced socio-economic growth as a result of the negative effects of climate change
Increased loss of lives and people displaced as a result of flood hazards
Increased damage to existing and planned infrastructure
Under the predicted conditions of climate change
Problem: Local communities in the selected communes of Bamako, Kayes and Mopti are vulnerable to floods
Widespread poverty
Land degradation
Limited technical capacity on DRM
Limited financial capacity to address DRM
Settlement patterns in the Niger delta
Limited adaptive capacity at the household level
Widespread reliance on natural resources-based livelihoods
Reduced water infiltration
Increased soil erosion
Limited knowledge on prevention and attenuation techniques
Limited knowledge on forecasting flood risks
Limited skills transfer from national to local government on DRM
Limited budget allocation to local government for DRM interventions
Limited technical capacity to access international funds
Poor land use planning and management
In-migration (because of ongoing droughts in the north)to the south which is densely populated
Limited mainstreaming of flood risks in governing documents
Unsustainable management of natural resources
Loss of human lives and people displaced in the event of floods
Damage to existing infrastructure
Vulnerable local communities live in flood-prone areas

Appendix 10: Institutional and Policy Context.

Institutional context

In 1998, the GoM established the (**General Directorate for Civil Protection)** DGPC under the Ministry of Internal Security and Civil Protection (MSIPC) to manage the risks of climate-related hazards and natural disasters in Mali. The main responsibilities of the DGPC consist of developing and implementing national policies related to civil protection, including: i) coordinating activities to prevent the occurrence of climate-related hazards and natural disasters; ii) developing disaster management plans; iii) undertaking emergency and rehabilitation operations following the occurrence of climate-related and non-climate hazards; and iv) providing training related to civil protection to government staff[6].

The **Ministry of Environment, Sanitation and Sustainable Development** (MEADD) is responsible for developing and implementing the national policy in the fields of environment and sanitation, respectively. The MEADD's responsibilities include: i) improving the living conditions of the population; ii) implementing measures to protect nature and biodiversity; iii) combatting land degradation, desertification and rivers' siltation; iv) promoting the systematic treatment of waste waters; v) developing and implementing measures to prevent or reduce environmental risks; vi) preventing and reducing pollution; vii) developing and enforcing the legislation on hunting and forestry; and viii) disseminating of information on topics related to environmental protection through public education.

The **Environmental Agency for Sustainable Development** (AEDD) is responsible for Mali's environmental policy matters. It was established in 2010 to replace the Permanent Technical Secretariat of the Institutional Framework of Environmental Management Matters (STP/CIGQE). The institute was originally created as a public administrative institution with a number of responsibilities including: i) strengthening the capacity of stakeholders involved in awareness raising and education on environment management, climate change and sustainable development; ii) mobilising finances to support activities related to environment protection, climate change and sustainable development; iii) monitoring the implementation of conventions, international agreements and treaties ratified by Mali regarding the environment, desertification, climate change and sustainable development; iv) developing and monitoring the implementation of environmental policies – including climate change – as well as the protection and monitoring of programmes on natural resources; v) disseminating research results on environment protection, reduction of desertification, adaptation to climate change and sustainable development; and vi) participating in the implementation of the Environmental Action Plan programmes.

Mali-Météo is the national agency of meteorology and was established in 2012 with technical assistance from the World Meteorological Organisation. The objective of the Mali-Météo is the monitoring and analysis of climate to ensure the safety of people and property. In addition, Mali-Météo aims to contribute to the socio-economic development of the country by providing appropriate information and services to users in sectors such as aviation, agriculture, construction, health, water resources, energy and civil protection. Under the supervision of the Ministry of Transport, Mali-Météo is participating in the development of national policies related to meteorology. In particular, Mali-Météo is responsible for: i) operating and maintaining a national network of meteorological observations; ii) providing weather information and services for several socio-economic sectors to reduce the adverse effects of natural disasters; iii) participating in studies and research on climate; iv) monitoring and implementing measures related to the international commitments ratified by Mali in the field of climate and meteorology; and v) using the National Framework Climatological Services (CNSC) to establish good coordination and communication based on the provision and use of climate information for the benefit of all users.

[6] See National Consultant Report attached as Appendix 12.

The Ministry of Economy and Finance (MEF) prepares and implements the economic, financial and monetary policies of the state. In particular, the MEF is responsible for: i) coordinating government policy on economic, financial and monetary matters; ii) developing the macro-economic reference framework for economic policies in the medium and long term; iii) developing measures to increase the state's resources and improve the efficiency of public spending; iv) developing rules on public-private partnerships and innovative financing mechanisms to promote private sector investment; and v) providing financial oversight to local authorities and public bodies that receive assistance from the state.

The **National Water Directorate** (DNH) was established by Ordinance No. 10 / 0O1 / P-RM on 18 January 2010 under the Ministry of Water and Energy. Under this law, the DNH is responsible for developing national policies related to Mali's water resources and is mandated to promote integrated water resource management (IWRM) at a national level. The DNH is responsible for the development of documents on IWRM including policy documents such as the National Water Policy in 2006. The core responsibilities of the DNH include: i) developing strategies for the supply of drinking water, including the mobilization and management of water resources; ii) developing and implementing minimum standards for the management of water resources; iii) undertaking an inventory, and assessing and monitoring water resources and hydraulic structures; iv) planning, monitoring and developing the public water service; v) evaluating programmes and projects to implement infrastructure or hydraulic developments; and vi) participating in the promotion of sub-regional cooperation in the control and management of water resources.

The **National Directorate of Sanitation, Pollution and Nuisance Control** (DNACPN) was established by Ordinance No. 98-937 to develop and implement the national policies on sanitation and pollution control. To this end, DNACPN is responsible for: i) monitoring sectoral policies, development plans, programmes and environmental matters; ii) supervising and providing technical oversight to Environmental Impact Assessments (EIAs); iii) ensuring control and compliance with national standards and legislation for sanitation, pollution and nuisances; iv) providing training and information to sensitise citizens on topics related to sanitation and pollution; and v) monitoring Mali's environmental situation.

The **National Directorate of Rural Engineering** (DNGR) was established by Law No. 05-013 of 11 February 2005. The DNGR's responsibilities include: i) developing long-term maintenance systems for the agricultural equipment; ii) developing and monitoring the implementation of the rural land policy; iii) developing and monitoring the implementation of investment projects and programmes relating to the development of the agriculture sector; and iv) centralising, processing and disseminating statistical data on irrigation schemes and equipment.

The National Directorate of Urbanism and Housing (DNUH) was established in 2001 with the mandate to develop national policies related to urban planning, construction and housing. This directorate is also responsible for the coordination and control of service delivery projects in urban contexts including: i) undertaking all the research and studies necessary for the development and implementation of urban planning policies; ii) ensuring the implementation of public service programmes including the evaluation of their results; and iii) providing support and advice to local authorities on urban planning.

To decentralise the GoM, the **General Directorate of Territorial Collectivities** (DGCT) was created to build and strengthen existing capacities within local government authorities in the country. The DGCT supports local government authorities in implementing development projects and in developing their respective Economic, Social and Cultural Development Programme (PDESC). Local government authorities receive support on mainstreaming measures to reduce the negative effects of climate change.

National Investment Agency for Local Communities (ANICT) is a public administration agency created by Law No. 00-042 of 7 July 2000. ANICT's responsibilities include: i) raising and allocating subsidies to local government for project management; ii) ensuring the equitable distribution of subsidies between local communities based on their level of development; iii) assisting local authorities to develop and deliver public services to local households; and iv) providing financial and administrative support for the management of the National Support Fund to Local Authorities.

The **National Directorate of Agriculture** (DNA) is responsible for implementing the Policy on Agricultural Development in the country which was developed in 2013. To do so, the DNA designs and monitors the implementation of programmes and interventions to increase agricultural production and promotes the modernization of the agricultural sector. The DNA also undertakes training and awareness-raising with farmers on several subjects including the effects of climate change on their crops.

The **National Directorate of Planning and Development** (DNPD) is responsible for the planning and implementation of development policies at the national, regional and local level. This government authority promotes cross-sectoral development to further economic development in the country.

The **Ministry of National Education** (MNE) is responsible to manage primary education in the country. The several programmes implemented by the MNE seek to improve the education system in the country to increase the literacy rate – currently at ~46%. The MNE manages all primary schools in the country to offer quality education to all children.

The Niger River Basin Agency (ABFN) was established by Ordinance No. 02-049 / P-RM of 29 March 2002. The ABFN is a legally and financially autonomous entity with the mandate to safeguard the Niger River and its associated tributaries and watersheds. Responsibilities of the ABFN include: i) promoting and ensuring the preservation of the river; ii) protecting terrestrial and aquatic ecosystems; iii) protecting the banks and watersheds against erosion and siltation; iv) strengthening the river resources, tributaries and watersheds; v) enhancing the management of water resources for different uses; vi) contributing to the prevention of natural disasters and pollution as well as maintaining the flow of the river; vii) continuing cooperation with similar technical institutes of countries alongside the river; and viii) designing and managing a financial mechanism to collect fees from water users.

The **Abderhame Baba Touré National Education Institution for Engineers** (ENI-ABT) is a public university and represents the academic community in Mali. It was established in 1963 in Bamako. Different specialisations in engineering are taught at the ENI-ABT.

In 2010**, the National Commission on the Environment** (CNE) was established to replace the two original bodies mandated to develop proposals and recommendations on matters relating to the environment in collaboration with the CIGQE, namely: i) the Inter-ministerial Committee; and ii) the Advisory Committee. The CNE includes representatives of the state, civil society, private sector and local authorities. By decree of the Prime Minister in 2011, the **National Committee on Climate Change** (CNCC) was established as an organ of the CNE by decree of the Prime Minister in 2011 to assist with the implementation of activities to combat climate change. The Minister of Environment, Water and Sanitation is the chair of the CNCC, while the AEDD holds the role of permanent secretariat of both the CNE and the CNCC.

Policy context

The **National Policy on Climate Change** (PNCC) was developed by the AEDD and the MEADD to address the challenges of climate change and to support sustainable development in Mali. The PNCC is focused on preventing and reducing the negative effects of climate-related hazards such as floods. The objectives of the PNCC include *inter alia*: i) promoting and supporting the integration of climate change into cross-sectoral and sectoral socio-economic development policies and strategies; ii) guiding interventions for sustainable development within the context of climate change; and iii) strengthening national institutional and technical capacities to address climate change.

To achieve the objectives of the PNCC, the **National Strategy on Climate Change** (SNCC, 2011) was developed by the AEDD and the MEADD. The SNCC comprises eight strategic areas which include: i) adopting and operationalising the National Institutional Framework of Climate Change; ii) promoting access to financial resources for addressing climate change; iii) strengthening national capacity and research to address the effects of climate change in Mali; iv) strengthening the network on climate-related information sharing and awareness-raising on climate change; v) climate monitoring; vi) promoting the consideration of the effects of climate change into sectoral policies; and vii) encouraging the private sector to participate in national efforts to collectively address the effects of climate change on Malians.

The **National Strategy on Sustainable Development (**SNDD**,** 2011) focuses on promoting sustainable development in the country. It was developed by the AEDD and the MEADD. The strategy recognises that the planning and implementation of development activities requires the involvement of all the actors. Its objectives include: i) improving the efficiency of public action on sustainable development; ii) promoting consistency among sectoral policies; and iii) developing synergies between existing development programmes.

Following the political instability in Mali in 2012, the GoM formulated a **Government Programme of Action** (PAG, 2013–2018) in collaboration with the AEDD and the MEADD with the objective of preventing the undermining of previous development achievements. The programme has been developed through a participatory process involving representatives from all ministries. It aims to: i) establish strong and reliable government institutions; ii) restore the security across the country; iii) implement an active policy of national reconciliation; iv) reconstruct schools in Mali; v) build an emergent economy; and vi) implement an active policy for social development.

The Social Development Policy (PDS, 1993) addresses challenges to the improvement of social conditions in Mali and to realise the rights of all citizens. The PDS was developed by the AEDD and the MEADD. The underlying principle of the PDS is that economic growth contributes to the improvement of living conditions for all segments of the population. This is to be achieved by addressing pressing social needs, combating the proliferation of diseases and eliminating famines. Furthermore, economic growth has the potential to create conditions to eliminate widespread poverty in the country by *inter alia*: i) reducing unemployment – especially for the youth; ii) promoting social inclusion; iii) reducing inequality; and iv) combatting marginalisation and exclusion for sustainable human development.

The PNPE (1998) was developed by the AEDD and the MEADD. It has been translated into nine action plans, policies and strategies. In 2009, following a national reconsideration of the need for environmental protection, 12 additional documents were developed and added to the PNPE. Agriculture as the primary focus for many of them, followed by water resources management and livestock. There is however a lack of coherence and redundancy among these 12 strategies[7].

[7] EU. 2014. Update of Mali's environmental profile.

Strategic Framework for Investments in Sustainable Land Management (CSI-GDT, 2010). Mali's CSI-GDT was developed by the AEDD and the MEADD, and contains six focal areas for priority investments including: i) supporting the upscaling of on-the-ground activities relating to Sustainable Land and Water Resources Management (SLWM); ii) strengthening of consulting services and business services in support of SLWM in the country; iii) developing effective systems for the acquisition, management and dissemination of SLM knowledge, monitoring and evaluation; iv) implementing a communication strategy to support the use of SLM practices; and v) building the capacity of all relevant stakeholders within the environmental sector to promote the implementation of SLM throughout Mali.

The **National Action Plan on the Integrated Management of Water Resources** (PANGIRE, 2007) was developed by the DNH with the objective to improve the management of water resources through the application of the Water Code. PANGIRE will promote economic and social development as well as the preservation of ecosystems.

The objective of the **Strategic Plan for Development in the District of Bamako** (PSDDM, 2001) is to promote sustainable development within Bamako. This plan details the strategies for the sustainable development of Bamako's local sectors in the short, medium and long term. The PSDDM was developed by the local government authorities and recognises that floods threaten socio-economic development within this district.

The **Economic, Social and Cultural Development Programme for the Urban Commune of Kayes** (PDESC, 2011-2015) was developed by the local government authorities in Kayes and guides the development of Kayes' local economy. The objectives of the PDESC are to enhance the quality of life of the population and to improve access to basic social services. This strategic document details: i) the roadmap for the development of each economic sector in Kayes; ii) the barriers identified for each economic sector; iii) the actions to be implemented to overcome these barriers; and iv) the development potential of each economic sector. The limited number of qualified staff and insufficient coordination among government authorities are recognised as development challenges in Kayes. Climate change is also recognised as a threat to people livelihoods. A portion of the budget for the commune's environmental sector is allocated to awareness-raising on the effects of climate change in Mali.

The **Economic, Social and Cultural Development Programme for Mopti** (PDESC, 2011-2015) is a planning tool developed by the local government authorities in Mopti to achieve the vision for Mopti. The PDESC determines the medium- to long-term development goals and promotes a consolidated vision among all economic sectors. This development planning tool supports technical capacity strengthening for decision-makers within local authorities to effectively manage the district of Mopti. The PDESC recognises the need to promote adaptation to the effects of climate change in Mopti and reduce the degradation of natural resources.

Appendix 11: Site Selection Process.

The site selection process for the LDCF-financed project was designed to be transparent and inclusive of the relevant stakeholders. The districts of Bamako, Kayes and Mopti were identified as being flood-vulnerable areas based on analyses undertaken during a study of Mali's flood risks and hazards. The criteria used for the selection of communes and local communities are: i) recurrence of flood risks; ii) access to the sites (i.e. roads, communication infrastructure and security aspects); iii) availability and commitment of stakeholders; iv) governance in terms of the capacity of the beneficiary communities to manage the LDCF-financed interventions during project implementation, as well as after the completion of the project; v) current adaptation measures implemented by the potential beneficiary communities; and vi) demography in terms of the size of the population. Table 2 below summarises the sites selected for implementing LDCF-financed interventions in the districts of Bamako, Kayes and Mopti.

Bamako: The selection of specific intervention areas within the abovementioned target areas was undertaken through a series of workshops held by the AEDD in November 2015 in Bamako, Kayes and Mopti. As previously discussed in Section 2.1, several workshops were held in Bamako, Kayes and Mopti to determine the intervention sites based on pre-determined criteria and the activities to be implemented under the LDCF-financed project – to decrease the vulnerability of local communities to climate-related hazards and natural disasters including floods. Based on the stakeholder's input – including *inter alia* regional and local government authorities, NGOs and tertiary education institutions – at the workshop held in Bamako, 25 local communities in communes I, IV and VI were selected for LDCF-financed interventions. See Appendix 13: Mission Report.

Kayes: Three workshops were held in the district of Kayes from 02-05 November 2015. A regional workshop was held to present the objectives of the LDCF-financed project to both regional and local government authorities including *inter alia* members of the regional, circle and communal councils, as well as NGOs and journalists. Representatives of the communes of Bafoulabé, Kita and Sébékoro as well as those from the villages of Oussoubidiangna and Sébékoro participated in the regional workshop. In addition, two workshops were held in the circles of Bafoulabé and Kita in the communes of Tomora and Sébékoro on 03 and 05 November, respectively. A total of 122 participants attended the workshops held in the district of Kayes. Out of 157 communes in the district of Kayes, two were selected for LDCF-financed interventions, namely Tomora and Sébékoro. See Appendix 13: Mission Report.

Mopti: Three workshops were held in the district of Mopti from 04-07 November 2015 with ~60 participants from several regional and local government departments. A questionnaire was used to identify beneficiary communities and site-specific interventions to be implemented to decrease the vulnerability of the affected communities to floods. The questionnaire was used among the relevant stakeholders (see Appendix 13 for the Mission Report) in the communes of Fatoma, Sio and Pignari Bana. Six themes were explored in the questionnaire, namely: i) knowledge of flood risks; ii) existing adaptation measures to climate change in the communities; iii) capacity of the stakeholders to undertake adaptation planning and implement interventions accordingly; iv) awareness-raising of the adverse effects of climate change within the vulnerable communities; v) capacity of several stakeholders – including *inter alia* GoM, regional and local government authorities – and beneficiaries to fund adaptation interventions; and vi) baseline projects.

Based on the results of the questionnaire, the communes of Sio and Fatoma – with six and nine villages out of a total of 20 and 25, respectively – have experienced floods over the period 2013-2015. In addition, seven out of a total of 23 villages in the commune of Pignari Bana have experienced recurring floods in the last few years. Based on an assessment of the pre-determined criteria per site proposed for LDCF-financed interventions, the sites selected are within the circles of Bandiagara and Mopti, as well as Pignari Bana. See Appendix 13: Mission Report.

Table 1: Communes and villages selected for LDCF-financed interventions.

District	Circle	Commune	Villages
Bamako	Bamako	Commune I	Bankoni Sikoroni Korofina Hypodrome Doumazana Djélibougou Boulkassoubougou Sotuba
	Bamako	Commune IV	Hamdalaye Lafiabougou Taliko Kalabambougou Bougoudani Kobadougou Sébénikoro Djikoroni
	Bamako	Commune VI	Missaboukou Yirimadio Senou Niamakoro Sogoniko Sarambougou Djaneguela
Kayes	Bafoulabe	Tomora	Barsafé Yahinané Oussoubidiangna Touba Koulondinkoye Godi
	Kita	Sebekoro	Sebekoro Badinko Sorotabougou Torofouladji Bangassi
Mopti	Bandiagara	Pignari Bana	Bandiougou Ficko Goundaka Kansila Kowa Mackou Pigna Tounkari Tangadouba
	Mopti	Fatoma	Fatoma Komboko Saredera Niakongo Thy Tiliwalt

Appendix 12: Mission Report.

13.1.: Bamako

RAPPORT DE L'ATELIER DE FORMULATION DU PROJET GESTION DES RISQUES CLIMATIQUES ET D'INONDATIONS (GRCI) EN VUE DE PRESERVER DES VIES ET DES BIENS AU MALI

Le vendredi, 13 Novembre 2015 au Gouvernorat du District de Bamako

L'an deux mille quinze et le 13 novembre s'est tenu dans la salle de conférence du Gouvernorat du District de Bamako, l'atelier de formulation du projet gestion des risques climatiques et d'inondations (GRCI) en vue de préserver des vies et des biens au Mali. L'atelier a réuni les représentants du gouvernorat du District de Bamako, les autorités municipales des six communes, les représentants de l'Association des municipalités du Mali, des services techniques, du PNUD et l'équipe de Consultants.
La cérémonie d'ouverture était placée sous la présidence du Gouverneur du District de Bamako. Deux interventions ont marqué cette cérémonie : l'allocution du représentant du Directeur Général de l'Agence de l'Environnement et du Développement Durable (AEDD) et le discours d'ouverture du Gouverneur.
Le représentant de Directeur Général de l'Agence de l'Environnement et du Développement Durable dans son intervention a salué et remercié les participants de leur présence. Il a mis l'accent sur l'importance du projet pour les populations dans les zones d'intervention du projet à savoir le district de Bamako, les régions de Kayes et de Mopti.
Quant au Gouverneur du District, il a souhaité la bienvenue aux participants et a évoqué les effets néfastes des changements climatiques notamment les inondations et d'autres formes de catastrophes naturelles. Il a remercié le PNUD pour son accompagnement et a déclaré ouverts les travaux de l'atelier.

Déroulement de l'atelier

Après la pause-café, le bureau suivant a été mis en place pour la police des débats :
Président : Mr Barou GUINDO, Conseiller aux Affaires Economiques et Financières du Gouverneur
Modérateur : Mr Mohamed ADIDEYE /AEDD

Rapporteurs : Mr Chienkoro DOUMBYA, Consultant, et Mr Aly dit Karamoko NANAKASSE, CBPAOU/AEDD

Les travaux ont commencé par une présentation sur le document de formulation du Projet. Cette présentation a porté sur 6 points :

1. Les objectifs de la mission
2. Les résultats attendus
3. Le contexte
4. La présentation de la note conceptuelle
5. Le questionnaire
6. Les critères de choix des communes/sites.

Il faut noter que le projet comporte trois composantes que sont :

- La connaissance des risques en vue d'orienter les populations pour la préparation, la prévention, la prévention des désastres et l'élaboration des réponses ;
- Les reformes politiques, en vue de la mise en place de mesures de prévention et de gestion des risques au niveau local ;
- Les investissements dans des pratiques résilientes aux changements climatiques en vue de réduire la vulnérabilité des communautés les plus exposées.

Après la présentation, les questions ont essentiellement porté sur le coût du projet pour le District de Bamako, les mesures de prévention des risques, les critères de choix des régions, les rôles du PNUD et de l'AEDD, les projets d'ancrage dans les régions choisies, les dispositions envisagées pour l'occupation des bas-fonds.
Des réponses satisfaisantes ont été apportées à toutes les questions par les Consultants et le représentant du PNUD.
Au terme des questions réponses, les participants ont convenu de retenir trois communes à savoir la Commune I, la Commune IV et la Commune VI comme zones d'intervention du projet dans le District de Bamako.
Ainsi, trois groupes ont été constitués avec pour mandat d'identifier des activités clés à retenir par rapport aux trois composantes du projet.

A l'issue des travaux de groupes, les activités suivantes ont été proposées par commune :

Groupe de travail sur la Communes I

Les actions proposées sont :

- ✓ Décrire le système de drainage des eaux de pluies ;
- ✓ Mettre en place un système d'alerte précoce sonore ;
- ✓ Informer et sensibiliser les populations ;
- ✓ Créer des comités d'éveil et de gestion entre la commune et les services météo ;
- ✓ Dégager et aménager les servitudes des marigots ;
- ✓ Prévoir des textes par rapport à la gestion des risques climatiques ;
- ✓ Faire respecter le plan d'aménagement de la commune.

Groupe de travail sur la Commune IV

Les actions proposées sont entre autres :

- ✓ Viabiliser les quartiers (creuser et curer les caniveaux).
- ✓ Aménager les collecteurs naturels le Woyankô, le Djissourountou à l'image du Diafaranakô ;
- ✓ Sensibiliser la population ;
- ✓ Créer des collecteurs en ceinture pour les eaux de pluie de Hamdallaye, à Bougoudani, Taliko, Sebenicoro et Sibiribougou ;
- ✓ Gérer les déchets solides ;
- ✓ libérer les servitudes des lits des collecteurs, des constructions illicites.

Groupe de travail sur la Commune VI

Ce groupe a proposé les actions suivantes :

- ✓ Etudier et faire le diagnostic du système d'évacuation des eaux ;
- ✓ Sensibiliser, informer et former les citoyens ;
- ✓ Réaliser des collecteurs et caniveaux d'évacuation ;
- ✓ Réhabiliter les structures existantes et sur creuser le collecteur de Missabougou ;
- ✓ Faire la jonction du collecteur Banankabougou à celui de l'avenue de l'OUA ;
- ✓ Protéger les berges du fleuve et les cours d'eau ;
- ✓ Mener des activités d'assainissement et de libération des servitudes des zones d'occupation.

Le récapitulatif de ces actions figure au Tableau 2 en Annexe.

A la fin des travaux, le Conseiller des Affaires Economiques et Financières du Gouverneur du District a remercié les représentants des différentes structures présentes à l'atelier pour leur participation de qualité.
Il a remercié et salué l'initiative du PNUD en direction de la population malienne avant de déclarer clos les travaux de l'atelier.

Bamako, le 13 novembre 2015

Le Président de Séance

Mr Barou GUINDO

Les rapporteurs

Mr Chienkoro DOUMBIA

Mr Aly dit Karamoko NANAKASSE,
CBPAOU/AEDD

Tableau 2 : Récapitulatif des actions des communes du District

Commune 1	Commune 4	Commune 6
– Description du système de drainage (hydrographie et hydraulique)	– Travaux de viabilisation	– Conduite d'étude diagnostique du système d'évacuation des eaux de pluies
– Mise en place de système sonore d'alerte aux crues (échelles de crues,..)	– Réalisation de caniveaux dans les quartiers de Sébénicoro et Kalabanbougou	– IEC pour changement de comportement en matière de gestion des ordures et d'occupation de l'espace en évitant les lits des marigots
– Redynamisation des Comités existants (Comité de veille et comité de gestion de crises)	– Curage des caniveaux à Lafiabougou et Hamdallaye	– Réalisation de nouveaux caniveaux
– IEC aux bonnes pratiques d'assainissement	– IEC pour changement de comportement en matière d'assainissement	– Curage et surcreusement des collecteurs
– Formation de relais de partage d'infos météorologiques	– Aménagement des berges des collecteurs naturels à l'instar du Diafaranako	– Protection des berges
– Révision des textes de la décentralisation	– Libération des zones à risques	– Elaboration et mise en œuvre de SDAGE d'assainissement
– Curage des caniveaux existants	– Protection des berges	– Réalisation de centres de secours de la Protection Civile en vue de réduire les délais d'évacuation
– Réalisation de caniveaux d'évacuation des eaux de pluies	– Aménagement des berges du fleuve Niger	–
– Déguerpissement des servitudes et leur aménagement en espaces de loisirs	– Réalisation de collecteur ceinture pour la collecte des eaux des collines de la commune pour une meilleure gestion des eaux de pluies	–
– Aménagement des berges des cours d'eau	– Améliorer la Gestion des déchets solides	–
–	– Collecte de documentation existante dans la commune avec propositions de solutions	–

MEMBRES DE L'EQUIPE *: Dr Georges DIAWARA, Consultant national AEDD, Dr Alassane DIARRA, Consultant, Mme DIAWARA, Haoua DEMBELE, Gestion logistique et financière, M. Souleymane DIALLO, Chauffeur*

PROJET GESTION DES RISQUES CLIMATIQUES ET D'INONDATIONS(GRCI)

LISTE DE PRESENCE DES PARTICIPANTS

Lieu : Bamako le 13 Novembre 2015

N°	Noms et Prénoms	Email/Téléphone	Titre/Institution
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14	Agalyou A MAIGA	76 42 70 18	Chef DED/AEDD
15	Sekou KONE	66 07 77 55	Chef DPA/DRIH-DB
16	Fassoko COULIBALY	66 05 08 71	
17	Boubacar SAMAKE	70 77 86 51	Gouvernorat
18	Tacko FANE	66 79 44 54	Courrier archiviste

19	Mohamed L COULIBALY	83 70 29 00	Gouv
20	SaNATA GUIRE	76 07 74 32	Pool saisie
21	Oumou KASSAMBARA	76 12 67 24	Secretaire gouv
22	Oumou DAOU	63 40 77 50	Association
23	Adama FOFANA	63 28 90 99	Pool saisie
24	Diarra Mariam DEMBELE	76 41 37 82	Gouv
25	Aminata DICKO	78 16 46 26	Cabinet gouv
26	SY Salimata DIALLO	76 39 04 88	Chef Département
27	Macina Sira BAGAYOKO	76 49 05 30	Chef du personnel Gouv
28	Ibrahim SIDIBE	73 36 57 83	Gouv
29	Mahamane SANOGO	76 04 40 03	GRCI
30	Barou GUINDO	76 08 27 60	CAEF
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33	Ina SANGARE	66 79 44 73	Gouv
34	Assétou TOURE	76 23 49 33	Gouv
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39	Bamba Bathouly KAREMBE	66 83 03 25	Mairie Commune I
40	Ousmane BAH	76 24 62 63	Ségal C V
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47	Arabiatou DIALLO	76 99 89 90	CAFO
48	Georges DIAWARA	76 44 23 90	Consultant
49	Alou TRAORE	63 33 66 86	
50	Sidiki KONE	76 37 74 75	Gouv
51	Lassana DAGNIO	66 72 23 44	Gouv
52	Sariké DIARRA	76 14 65 54	Gouv
53	Diakridia DIABATE	65 23 30 54	Gouv
54	Djeneba SY	66 11 60 01	Gouv
55	Lamine KOUMARE	66 55 69 52	Gouv

Stakeholder consultation	Total number of attendees	Number of women who attended meeting	% of women representation
Bamako 13 Nov 2015	55	18	33

13.2: Kayes

A

MONSIEUR, LE CONSEILLER AUX AFFAIRES ECONOMIQUES ET FINANCIERES,

MESSIEURS LES PREFETS DES CERCLES DE BAFOULABE ET DE KITA,

MESSIEURS LES SOUS PREFETS D'OUSSOUBIDIANGNA ET DE SEBEKORO,

MESSIEURS LES MAIRES DES COMMUNES DE TOMORA ET DE SEBEKORO,

MESSIEURS,

Nous sommes rentrés à Bamako après dix jours de mission dans votre région prévue du 28 octobre au 06 novembre 2015.

Après l'atelier régional tenu à Kayes le Lundi 02 novembre 2015, nous nous sommes rendus à Oussoubidiangna le même jour où nous avons pu réaliser l'atelier communal de la Commune du Tomora le Mardi 03/11/2015 avec les élus, les responsables des services techniques, de la société civile et des ONG, en présence et avec l'appui des autorités locales : le Sous-Préfet et le Maire.

Le même jour nous avons pu regagner Manantali pour y passer la nuit et le lendemain Mercredi 04/11/2015, nous avons pris la route de Kita pour y rencontrer, Monsieur le Préfet, du Cercle de Kita avec lequel nous avons eu un entretien sur la mission.

De son bureau nous avons rejoint la Commune de Sebekoro où nous avons eu un entretien avec, Monsieur le Sous-Préfet et Monsieur le Maire, qui nous ont proposé de revenir le lendemain pour la tenue de l'atelier communal, ce qui leur permettra d'assurer une meilleure participation aux travaux.

L'offre fut acceptée et hier Jeudi 05/11/2015 dans la journée, nous avons tenu la rencontre avec les élus, les responsables des services techniques, de la société civile et des ONG, en présence et avec l'appui des autorités locales : le Sous-Préfet et le Maire. L'activité a mis fin à notre mission dans la région.

En résumé voici les résultats de la mission en attendant leur validation finale :

TABLEAU I : CHOIX DES COMMUNES ET DES SITES (VILLAGES) POUR LE PROJET DE GRCI -MALI

REGION	CERCLES	COMMUNES	VILLAGES
KAYES	BAFOULABE	TOMORA Chef-lieu : (Oussoubidiangna)	Barsafé
			Yahinané
			Oussoubidiangna
			Touba
			Koulondinkoye
			Godi
	KITA	SEBEKORO Chef-lieu : (Sebekoro)	Sebekoro
			Badinko
			Sorotabougou
			Torofouladji
			Bangassi

TABLEAU II : DEFINITION DES ACTIVITES POUR LE PROJET DE GRCI -MALI

SITES (VILLAGES) DE LA COMMUNE DU TOMORA
- Digues de protection - Reboisement - Formation des comités de lutte contre les risques climatiques - Information et Sensibilisation des populations - Construction de magasins de stockage (Sécurité alimentaire) - Digues filtrantes - Retenues d'eau - Construction de ponts à l'entrée et à la sortie des villages vulnérables - Cordons pierreux - Construction de puits dans la zone de transhumance des animaux des villages

- Adduction d'eau (Système de pompage solaire + forages)
SITES (VILLAGES) DE LA COMMUNE DE SEBEKORO
- Elaborer des programmes et les insérer dans le PDSEC de la commune - Elaboration de plan de lutte - Libération des passages des eaux de ruissellement - Entretien des canaux d'irrigation - Surcreusement des fossés - Sensibilisation et Information - Retenue d'eau - Aménagement des plaines - Reboisement - Vulgarisation des variétés adaptées (Semences) - Techniques d'amendement des sols (restauration) dans tous les villages - Formations - Constitution des comités de lutte contre les risques climatiques

Par la présente nous vous remercions chacun en ce qui le concerne pour le précieux appui ainsi que l'importance que vous avez accordé à l'activité. Nous remercions infiniment Nous remercions infiniment les responsables des services techniques, les élus des conseils régionaux, les élus des sept (7) conseils de cercles et des deux conseils municipaux du Tomora et de Sebekoro pour leur disponibilité et leur participation aux travaux. Nous remercions les représentants de la société civile et des ONG en place dans les différentes localités visitée pour intérêt porté à l'initiative et leur participation très active aux travaux. Nous remercions plus particulièrement, Monsieur le Conseiller, Monsieur Moussa Aly MAIGA pour sa promptitude et l'efficacité de ses appuis multiple qui nous ont permis de d'atteindre les résultats escomptés dans des délais raisonnables. A travers lui nous disons un grand merci aux Préfets des deux (2) cercles de Bafoulabé et de Kita pour leur compréhension et les facilités qu'ils nous ont données qui nous ont permis de remonter les obstacles inhérentes à notre mission dans le contexte particulier de leur circonscription respective . Le même remerciement va à l'endroit de Messieurs les Sous – Préfets et Messieurs les Maires des communes de Tomora et de Sebekoro dont les conditions de travail souvent difficiles ne les ont pas empêchés de répondre avec promptitude et efficacité à notre demande.

Pour l'Equipe de la Mission d'identification des sites et des activités du projet : *« Gestion des risques d'inondations et climatiques en vue de préserver des vies et des biens au Mali (GRCI-MALI) »*, Région de Kayes, **Georges DIAWARA, Alassane DIARRA, DIAWARA Haoua DEMBELE, Souleymane DIALLO.**

Dr Georges DIAWARA /Téléphone : 66 72 92 75 – 76 44 23 90 / Email : geodiawara@gmail.com

CONTEXTE

1. OBJECTIFS

a) Objectif global de la mission

b) Objectifs spécifiques

2. METHODOLOGIE

Il est important de rappeler que l'opération concerne trois régions du Mali. Les zones vulnérables prises en compte se répartissent entre les régions de Kayes, de Mopti et le District de Bamako. Il s'agit d'identifier au niveau des deux premières entités territoriales (Kayes et Mopti) les deux communes les plus vulnérables aux risques d'inondation. Cette identification porte sur trois communes dans le District de Bamako.

2.1. Approche officielle

Au niveau régional, la mission a procédé au briefing des autorités administratives et des élus :

- présentation des TDRs de la mission aux autorités administratives (Gouvernorat, Préfecture, Sous-Préfecture) ;
- présentation des TDRs de la mission aux élus (Conseil Régional, Conseil de cercle, conseil communal) ;
- prise de contact avec les services d'encadrement technique au niveau régional (DRPC, Hydraulique, Météo) et présentation des TDRs de la mission.

Toutes les dispositions ont été prises par le Gouvernorat de Kayes en la personne du Conseiller aux Affaires Economiques et Financières qui n'a ménagé aucun effort tant pour la bonne organisation de l'atelier régional de Kayes que pour le bon déroulement de la mission dans les communes choisies.

Les Préfets de Bafoulabé et de Kita aussi bien que les Sous-Préfets d'Oussoubidiangna et de Sébékoro ont témoigné de leur totale disponibilité et de leur soutien sans faille pour la réussite de la mission.

A noter que le succès retentissant de l'atelier de la commune de Tomora est imputable à la disponibilité et à l'engagement du Sous-préfet d'Oussoubidiangna et surtout à la bonne intelligence de ses rapports avec le Maire et ses conseillers.

Les difficultés rencontrées dans l'organisation de l'atelier communal de Sébékoro résultent de la récente prise en main de la mairie par le 1er conseiller en remplacement du Maire fraichement élu Député.

2.2. Echantillonnage

La méthode arrêtée est celle d'un échantillonnage stratifié.

a) La définition des unités d'échantillonnage s'est faite à deux niveaux :
- premier niveau (à l'intérieur de chaque région) : les unités d'échantillonnage sont les " communes " au nombre de deux;
- deuxième niveau (à l'intérieur de la commune) : les unités d'échantillonnage sont les communautés villageoises ;

b) Entretiens semi-directifs à l'aide d'un canevas de discussion (questionnaire) avec :
- les agents des services déconcentrés au niveau de la sous-préfecture (agriculture, élevage, eaux et forêts, santé, éducation)
- les conseillers communaux et des leaders d'opinion, des personnes ressources et la société civile.

2.3. Critères de choix des sites

Le choix des sites s'est fait sur la base des critères suivants :

1) la récurrence des risques d'inondations dans les sites.
2) Accessibilité des communes (routes, communications, y compris les aspects sécuritaires) ;
3) Disponibilité et engagement des parties prenantes ;
4) Gouvernance (capacités d'autonomie et de prise en charge par des bénéficiaires actuellement et après l'opération)
5) Mécanismes d'adaptation des acteurs/bénéficiaires aux risques climatiques ;
6) Démographie (taille de la population)

3. REALISATION DES ATELIERS AUPRES DES PARTIES PRENANTES

3.1. Atelier régional

Il a réuni l'équipe de la mission avec le Conseiller aux Affaires Economiques et Financières du Gouvernorat de Kayes, les représentants des services techniques régionaux aussi bien que ceux du Conseil Régional, des 7 Conseils de cercle, des ONG et de la Société Civile

La démarche a été la suivante :
- Allocution du Conseiller aux Affaires Economiques et Financières du Gouvernorat de Kayes (Président de séance de l'atelier)

- Présentation, par les consultants, de la mission d'identification des sites et de définition des actions (contexte, objectifs, résultats attendus, critères de choix des sites) et du contenu de la note conceptuelle du projet ;
- Echanges avec les acteurs régionaux sur le choix des deux (2) communes les plus vulnérables aux risques d'inondation dans la région de Kayes sur un total de 157 communes;
- Constitution de deux (2) groupes de travail pour le choix des 2 communes;
- Présentation, en plénière, des résultats des travaux de groupes sur la base des critères préétablis;
- Débats, amendements et consensus.

Les données de base collectées, à partir du contenu du canevas décrit ci-dessous, sont de type qualitatif.

3.2. Ateliers communaux

Ils ont réuni l'équipe de la mission avec les Sous-Préfets de Tomora et de Sébékoro, les représentants des services techniques des 2 sous-préfectures d'Oussoubidiangna et de Sébékoro aussi bien que ceux des Conseils communaux, des ONG et de la Société Civile locale

La démarche a été la suivante :

- Allocution du Sous-Préfet ;
- Allocution du Maire de la commune ;
- Présentation, par les consultants, du contenu du projet (contexte, objectifs, résultats attendus, critères de choix des sites) ;
- Echanges avec les acteurs locaux sur le choix des villages les plus vulnérables aux risques d'inondation dans les communes susmentionnées ;
- Constitution de deux (2) groupes de travail pour le choix des différents villages;
- Présentation, en plénière, des résultats des travaux de groupes sur la base des critères préétablis;
- Débats, amendements et consensus ;
- Définition des actions à mener dans chacun des villages sélectionnés selon leur spécificité.

Des données supplémentaires ont été collectées pour chacun des villages choisis sur la base d'un canevas sous la forme d'un questionnaire en six (6) points :

1. Connaissance des risques ;
2. Mesures d'adaptations aux risques climatiques ;
3. Evaluation des acteurs ;
4. Accompagnement à l'adaptation aux risques climatiques ;
5. Moyens de financement de l'adaptation au changement climatique (résilience) ;
6. Projets d'ancrage.

Les données de base collectées, à partir de ce questionnaire semi-directif, sont de type qualitatif.

Des débats ont eu lieu au sein de chacun des 2 groupes dans chacune des communes pour renseigner le questionnaire sur les sites (villages) choisis dont 6 sur 37 dans la commune de Tomora et 5 sur 22 dans la commune de Sébékoro (voir tableau ci-dessous).

.

4. CRITERES DE CHOIX DES SITES (Villages)

4.1. **Zone 1 Commune de TOMORA**

Critères de sélection des sites de la commune de TOMORA

SITES	Récurrence risques d'inondation	Accessibilité (routes, téléphone, sécurité)	Disponibilité/engagement des acteurs /bénéficiaires	Gouvernance-capacités d'autonomie des acteurs	Mécanismes d'adaptation	Démographie (taille de la population
Godi (hameau de culture de Diabakolon)	**X**	**X**	**X**	**X**	**X**	**X**
Yahinané	**X**	**X**	**X**	**X**	**X**	**X**
Barsafé	**X**	**X**	**X**	**X**	**X**	**X**
Oussoubidiangna	**X**	**X**	**X**	**X**	**X**	**X**
Touba	**X**	**X**	**X**	**X**	**X**	**X**
Moussala	**X**	n/a	n/a	n/a	**X**	n/a
Kéoulégna	**X**	n/a	n/a	n/a	**X**	n/a

n/a=non applicable

4.2. **Zone 2 Commune de SEBEKORO**

Critères de sélection des sites de la commune de TOMORA

SITES	Récurrence risques d'inondation	Accessibilité (routes, téléphone, sécurité)	Disponibilité/engagement des acteurs /bénéficiaires	Gouvernance-capacités d'autonomie des acteurs	Mécanismes d'adaptation	Démographie (taille de la population
Sebekoro	**X**	**X**	**X**	**X**	**X**	**X**
Badinko	**X**	**X**	**X**	**X**	**X**	**X**
Sorotabougou	**X**	**X**	**X**	**X**	**X**	**X**
Torofouladji	**X**	**X**	**X**	**X**	**X**	**X**
Bangassi	**X**	**X**	**X**	**X**	**X**	**X**
Sangarébougou	**X**	n/a	n/a	n/a	**X**	n/a
Djéguila	**n/a**	n/a	n/a	n/a	n/a	n/a
Sounty	**n/a**	n/a	n/a	n/a	n/a	n/a
Marena	**n/a**	n/a	n/a	n/a	n/a	n/a

n/a=non applicable

Liste des communes et des sites (villages) retenus pour le projet de GRCI –MALI

REGION	CERCLES	COMMUNES	VILLAGES
KAYES	BAFOULABE	TOMORA Chef-lieu : (Oussoubidiangna)	Barsafé
			Yahinané
			Oussoubidiangna
			Touba
			Koulondinkoye
			Godi
	KITA	SEBEKORO Chef-lieu : (Sebekoro)	Sebekoro
			Badinko
			Sorotabougou
			Torofouladji
			Bangassi

5. ACTIONS A MENER PAR COMMUNE ET PAR SITE

5.1. **Zone 1 Commune de TOMORA**

SITES	RISQUES	ACTIONS A MENER
Barsafé	Inondation	• Reboisement (aux abords des marigots) • Mise en place et formation du comité de prévention et de lutte contre les catastrophes climatiques • Sensibilisation / Education des populations • Construction de magasins de stockage • Construction de digues flottantes • Retenue d'eau • Construction de 2 ponts à 4 km d'Oussoubidiangna • Déplacement des popoulations
Yahinané	Inondation	• IDEM que Barsafé • Cordons pierreux • Déplacement de certaines habitations
Oussoubidiangna	Inondation sécheresse	• IDEM que Barsafé • Adduction d'eau (énergie solaire) • 10 puits à grand diamètre pour éviter les problèmes liés à la transhumance • Education environnementale (changement climatique)
Touba	Inondation	• IDEM que Barsafé • Construction de digues (il existe déjà 1 pont) • Déplacement de certaines habitations
Koulondinkoye	Inondation	• IDEM que Barsafé • Déplacement de certaines habitations
Godi	Problème approvisionnement en eau	• Adduction d'eau (énergie solaire) • Déplacement du cheptel vers les points d'eau

5.2. **Zone 2 Commune de SEBEKORO**

SITES	RISQUES	ACTIONS A MENER
Sebekoro	Inondation	• Creusement et surcreusement des fossés, chéneaux • Création et entretien des caniveaux

		• Reboisement • Libération des passages d'eau • Restauration des sols • Elaboration d'un programme de sensibilisation / formation /communication • Mairie : 1 journée de sensibilisation (PDSEC)
Badinko	Inondation	• Creusement et surcreusement des fossés, chéneaux • Libération des passages d'eau • Restauration des sols • Elaboration d'un programme de sensibilisation / formation /communication • Mairie : 1 journée de sensibilisation (PDSEC)
Sorotabougou	Inondation	• Aménagement des plaines et basfonds • Retenue d'eau • Reboisement • Restauration des sols • Elaboration d'un programme de sensibilisation / formation /communication • Mairie : 1 journée de sensibilisation (PDSEC)
Torofouladji	Inondation	• Aménagement des plaines et basfonds • Retenue d'eau • Reboisement • Restauration des sols • Elaboration d'un programme de sensibilisation / formation /communication • Mairie : 1 journée de sensibilisation (PDSEC)
Bangassi	Inondation	• Utilisation des variétés adaptées au changement climatique • Reboisement • Création et entretien des caniveaux • Techniques d'amendement des sols • Elaboration d'un programme de sensibilisation / formation /communication • Mairie : 1 journée de sensibilisation (PDSEC)

6. COÛTS INDICATIFS

(Informations recueillies auprès des régisseurs des communes retenues)

COMMUNE RURALE DE TOMORA	COMMUNE RURALE DE SEBEKORO

Formation		**Formation**	
- Formateur (local)	8000 F/H/J	- Formateur	30000 à 40000F/H/J
- Formateur (Cercle)	15000 F/H/J		
- Formateur (Bamako)	30000 F/H/J		----------
- Transport (Formateur et non-résidents)	----------	- Transport (Formateur)	2000 à 5000 F
- Hébergement au campement communal		- Transport non-résidents (frais de carburant)	
- Restauration à la charge de la Commune		- Hébergement au campement communal	
- Petit Déjeuner		- Restauration à la charge de la Commune	
- Déjeuner	500 F	- Petit Déjeuner	
- Diner	1000 F	- Déjeuner	
- Participant à la formation	1000 F	- Diner	500 F
	4000 F/H/J	- Participant à la formation	1000 F
			1000 F
			3000 à 10000 F/H/J
Information/Sensibilisation/Communication		**Information/Sensibilisation/Communication**	
- Emission radio (20 mn)	1000 F	- Emission radio (20 mn)	100 à 150 F/mn
- Avis et communiqué	1000 F	- Avis et communiqué	1000 F
Travaux de construction		**Travaux de construction**	
- Tonne de ciment prix Usine	74500 F	- Tonne de ciment prix Usine	74500 F
- Tonne de ciment rendue à Oussoubidiangna		- Tonne de ciment rendue à Sebekoro	105000 F
- Transport 1 tonne	120000 F	- 1 sac de ciment	5250F
- Chargement de sable (camion Benne)	30000F	- Chargement de sable (camion Benne)	17500 à 20000 F
- Chargement de gravier (camion Benne)	17500 F	- Location camion 7 Tonnes	17500 à 20000 F
- Location camion 10 Tonnes Kayes	17500 F	- Location charrette	40000 à 50000 F/J
- Location camion 10 Tonnes Bafoulabé	200000 F	- Maçon	5000 à 10000 F/J
- Maçon	150000 F	- Main-d'œuvre	2000 à 3000 F/H/J
- Main-d'œuvre	5000 F/H/J	- Eau (m3)	1500 F/H/J
- Eau (m3)	2000 F/H/J	- 1 Fut Eau (200 litres)	500 F
- 1 Fut Eau (200 litres)	500 F	- Transport charrette	1000 F
- Transport charrette	150 F	- Fabrique de brique Unité	500 F
- Fabrique de brique Unité	500 F	- Participation de la population aux travaux	30 F
- Participation de la population aux travaux	30 F		
			1500 F/H/J
	2000 F/H/J		
Adduction d'eau		**Adduction d'eau**	
- Puits à grand diamètre	5000000 F	- Puits à grand diamètre	3000000 F
- Forage/Château/Pompe électrique/12 bornes fontaines et 20 branchements à Oussoubidiangna	250000000 F	- Forage/	5000000 à 7500000
		- Château/Pompe /19 bornes fontaines et 200 branchements à Sebekoro	200000000 F

PROJET GESTION DES RISQUES CLIMATIQUES ET D'INONDATIONS(GRCI)

LISTE DES PARTICIPANTS

Lieu : Oussoubidiagna le 03 Novembre 2015

N°	Noms et Prénoms	Titre/ Institution	Email/Téléphone	Signature
1	Mohamet SISSOKO	Maire TOMORA	75 26 11 54	
2	Bemba TOUNKARA	Sous Prefet Oussoubidiagna	75 34 25 68	
3	Mamadou DIAWARA	SEGAL maire de TOMORA	75 07 61 55	
4	Habibou SISSOKO	1er adjoint maire Tomora	66 90 07 75	
5	Yamadou SISSOKO	Chambre d'Agriculture	74 27 56 60	
6	Brouma DIABATE	RECOTRAD TOMORA	75 33 58 75	
7	Diawara Haoua DEMBELE	Assistante Admin Fin Bamako	69 39 89 89 Diawara.haoua.dembele@undp.org	
8	Bougary DEMBELE	Coordo Radio	73 31 11 67	
9	Soukou Boudala TOURE	Radio	75 33 58 63	
10	Fatoumata B TOURE	C Comunale	75 33 43 52	

11	Abdoulaye DIABATE	C Communale	77 17 35 19	
12	Hamidou SISSOKO	C Communale	75 33 57 65	
13	Zan FOMBA	Chef de poste Forestier	75 19 24 96	
14	Yacouba SISSOKO	C Communale	75 15 86 88	
15	Diaba SOUKO	CAFO	75 33 58 82	
16	Mamoudou SISSOKO	SG Dioulafoudou	75 33 44 93	
17	Sékou SISSOKO	Répresentant chef de village	73 00 06 34	
18	YOUROUBALLO DIABATE	Animateur Radio Communale	74 16 12 36	
19	Dramane SANGARE	Régisseur des recettes CRT	78 17 22 84/ 63 12 49 43	
20	Adama DIALLO	CPS CAP	77 80 39 96/65 60 16 03	
21	Abdoulaye TRAORE	CPS CAP	79 09 40 07	
22	Yiriba MARICO	Agent Technique d'Agriculture	71 42 30 32	
23	A/C Tahi AG	Chef de poste Gendarmerie	66 21 85 86	
24	Pascal SAMAKE	Administrateur NPN	74 09 99 59	
25	Jean Marie KANOUTE	Eglise Protestante	63 19 10 37	
26	Dr Boubou KANTE	Medecin chef CCREF	66 78 20 14	
27	Adama CAMARA	Chef SLDSES	73 87 56 22	
28	Bréhima SISSOKO	Conseiller Communale	75 33 43 46	
29	Fanta Mady KANOUTE	Jeunesse	76 47 07 18	
30	Souleymane KANTE	Bambila	76 78 38 51	
31	Sékou DIALLO	Kangobele	74 09 99 59	
32	Djitoumou BALLAH	Dioulafoundou	74 16 12 36	
33	Kaba SISSOKO	C C	75 35 99 43	
34	Dramane TRAORE	CCREF	67 67 25 27	
35	Georges DIAWARA	Consultant national		
36	Alassane DIARRA	Consultant national		

PROJET GESTION DES RISQUES CLIMATIQUES ET D'INONDATIONS(GRCI)

LISTE DES PARTICIPANTS

Lieu : Sébékoro le 05 Novembre 2015

N°	Noms et Prénoms	Titre/ Institution	Email/Téléphone
1	Dr Alassane DIARRA	Consultant	66 73 18 55
2	Youssouf MORBA	Sous Prefet Sébékoro	75 26 34 52
3	Georges DIAWARA	Consultant national	76 44 23 90
4	Seydou SISSOKO	Maire	65 44 28 02
5	Mady KEITA	Régis des recettes	69 46 34 11
6	Aldiouma TOULEMA	Animateur PRODEC	76 14 67 10
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8	Madou SACKO	C Communal	73 31 11 67
9	Soukou Boudala TOURE	Radio	75 33 58 63
10	Fatoumata B TOURE	C Comunal	75 33 43 52

11	Abdoulaye DIABATE	C Communal	77 17 35 19
12	Hamidou SISSOKO	C Communal	66 77 22 98
13	Maimouna DAMBA	Animation	78 56 25 60
14	SANOGO Diabrité	Bendia	74 17 10 46
15	Boucary SYLLA	2ème adjoint au maire	79 46 67 82
16	Adama KANTE	GCS	75 04 57 38
17	Sékou MARICKO	Percepteur	76 35 01 53
18	Seydou COULIBALY	CPEF-S	76 26 23 96
19	Yacouba KEITA	Sécretaire CAP Sébécoro	65 96 60 75
20	Demba DIAWARA	Directeur d'école	78 57 85 37
21	Nouhou KONATE	Personne Ressources	73 78 63 87
22	Amadou CAMARA	Sécretaire Mairie	78 51 45 49
23	Oussoubi COULIBALY	DIEC SESCOM	63 21 52 39
24	Bemba CAMARA	Conseiller com	73 21 39 57
25	Mamourou DIAKITE	Séc admin jeunesse	76 26 85 68
26	Amadou DIARRA	2ème vice pre jeunesse	69 71 53 33
27	Ballan SISSOKO	Conseiller Communal	78 51 50 14
28	Dialla SISSOKO	Chef de poste vétérinaires	79 25 88 36
29	Makan FOMBA	Agent CMDT	77 03 50 74
30	Lassina DEMBELE	Chef de secteur Agriculture	65 85 97 18
31	Mahamadou SANGARE	Conseiller village sebekoro	76 32 95 69
32	Maguan DIAKITE	Conseiller village sebekoro	78 51 43 07
33	Souleymane KEITA	Municipalité	77 91 83 73
34	Jean Paul KEITA	Sécretaire dactylo	76 27 53 82
35	Brahima BERTHE	DNAPIA	78 51 67 38

PROJET GESTION DES RISQUES CLIMATIQUES ET D'INONDATIONS(GRCI)

LISTE DES PARTICIPANTS

Lieu : Kayes le 02 Novembre 2015

N°	Noms et Prénoms	Titre/ Institution	Email/Téléphone	Signature
1	Dr Alassane Diarra	Consultant Bamako	66 73 18 55 /74 65 16 36 aldiarra@hotmail.com	
2	Dr Georges DIAWARA	Consultant national AEDD Bamako	66 72 92 75/ 76 44 23 90 geodiawara@gmail.com	
3	Mohamadou KANOUTE	1er vice Président CC Bafoulabé	66 00 82 06	
4	Koura DABO	Président CC Bafoulabé	78 43 32 09	
5	Harouna SIDIBE	Conseiller Kita CC	66 85 00 76	
6	Mamadi SISSOKO	Conseiller Kita CC	73 26 93 65	
7	Diawara Haoua DEMBELE	Assistante Admin Fin Bamako	69 39 89 89 Diawara.haoua.dembele@undp.org	
8	Demba KEITA	Répresentant du Directeur RPC	61 80 17 97	
9	Sadio DIALLO	2ème vice prés CC Kayes	76 36 05 52	
10	Drissa COULIBALY	Coordo PASNDI-DRGR Kayes	79 10 39 78	

11	Modibo TIMBO	Prés CC Kayes	66 95 26 82	
12	Diami CAMARA	CAFO Kayes	76 01 85 90	
13	Toumany KANTE	DRH-Kayes	kantesolo@gmail.com 61 05 09 75	
14	Pouyo DOLO	Cameraman	66 37 50 25	
15	Mohamed O COULIBALY	DRE Kayes	65 08 54 51	
16	Bourama DEMBELE	Maire	69 54 22 80	
17	Mahamadou Aliou BARRY	Journaliste	66 40 14 63	
18	Richard RYAMUKURU	Conseiller Electoral PAPEM Kayes	75 73 57 65	
19	Sidiki BAGAYOKO	Assistant d'équipe Kayes	76 24 26 76	
20	Nouhou SOW	Technicien Gouv Kayes	76 37 41 30	
21	Diankiné DIARRA	Conseiller C de Nioro	79 07 09 74	
22	Tidiane Wane	CC Nioro	76 12 50 19	
23	Balla CISSE	Régisseur Commune Bangassi	66 39 01 24	
24	Modibo BOIRE	Chef division Cadastre DRDC Kayes	66 85 74 33	
25	Boubacar TRAORE	OPVCPV	76 18 59 91	
26	Baba TOURE	Chauffeur PAPEM	76 30 18 09	
27	Mamadou Seydou DIARRA	1er adjoint Prefet C Kayes	76 06 75 59	
28	Valère EBOSSO	Conseiller Electoral PAPEM	77 73 65 77	
29	Cheick Oumar FOMBA	Directeur Rég Serv Véterinaires Kayes	65 16 38 20	
30	Bourama DAO	Directeur rég de la Peche Kayes	biramadao@yahoo.fr 66 81 96 45	
31	CISSE Assitan	Directrice Rég Assainissement	cisseassitanf@yahoo.fr 76 31 56 14	
32	Moussa DEMBELE	DRPSIA Kayes	76 04 22 02	
33	Amadou K Thiéro	CRON.G kayes	66 67 42 66/ 78 76 76 00	
34	Mamoudou F DEMBELE	DRR Kayes	66 03 93 85	
35	Moussa Aly MAIGA	CAEF Kayes	66 72 58 75 moussaaly@yahoo.fr	
36	Aminata SAKIA	Asprafer	75 42 76 79	
37	Hama A MAIGA	Chargé Suivi ev DRDSES Kayes	76 80 97 22 hamamaiga50@yahoo.fr	
38	Ismaila KEITA	Studio TAMANI Kayes	76 36 91 78	

39	Fofana Ramata	CAFO Kayes	76 07 55 61	
40	Salia SIDIBE	Renseignements généraux	76 22 68 74	
41	Wahidou COULIBALY	CR Kayes	63 14 19 79	
42	Issa S TRAORE	GRK	69 60 66 98	
43	OTOGOLO KONE	DRIIK Kayes	76 31 43 31	
44	Makan COULIBALY	DREF Kayes	63 73 56 92	
45	Youssouf M DIARRA	CHERCHEUR au CRRA	76 33 07 76	
46	Ibrahima N'DIAYE	SG du Patronat Kayes	66 55 83 55 kayes@cnpmeli.org	
47	Apam KODIO	SG CRA Kayes	66 72 94 89	
48	Aissata DIA	CC Kayes	76 47 07 18	
49	Souleimane SISSOKO	Conseiller CC	91 31 10 31	
50	Hamidou KONE	DR Transport	76 48 76 50	
51	Madou DAOU	Chargé Suivi Hygiène/DRS Kayes	72 08 73 80	

Stakeholder consultation	Total number of attendees	Number of women who attended meeting	% of women representation
Kayes 02 Nov 2015	51	6	12
Oussoubidiangna 03 Nov 2015	36	3	9
Sébékoro 05 Nov 2015	35	3	9

13.3.: Mopti

RAPPORT MISSION DE MOPTI

« GESTION DES RISQUES D'INONDATION ET CLIMATIQUES EN VUE DE PRESERVER DES VIES ET DES BIENS AU MALI. »

I. Objectifs de la mission

Aux niveaux régional et communal

- Faire un consensus autour des critères de vulnérabilité face aux risques des inondations dans la région de Mopti ;
- Identifier les deux communes de la région les plus vulnérables aux inondations qui doivent abriter le projet ;
- Identifier les projets d'ancrage dans la commune et dans la région ;
- Identifier les activités appropriées pour rendre plus résilientes les communes identifiées ;
- Donner un coût indicatif des activités à mener.

II. Atelier régional de Mopti

Choix de communes vulnérables

Les activités menées en groupe ont permis aux trois groupes constitués de se pencher sur les différents points du guide d'entretien soumis. Ainsi chaque groupe au terme d'une profonde réflexion a pu dégager après de fructueux échanges, des réponses enrichies aux différents points du guide.

La plénière des travaux de groupe a permis, par consensus, le choix des deux communes les plus vulnérables de la région de Mopti qui sont :

- La commune de Fatoma dans le cercle de Mopti : elle compte 25 villages dont 9 sont vulnérables aux inondations ;
- La Commune de Pignari Bana dans le cercle de Bandiagara.

Activités à mener

- Sensibilisation sur les zones de construction des habitations;
- Curage des caniveaux ;
- Création des canaux de circulation d'eau (assainissement) ;
- Amélioration des mesures de préventions.

Projets d'ancrage

- PASARC (NEF)
- PDD DIN/DNEF
- BRACED (NEF)
- PLANETE URGENCE (UNICEF)
- PLANETE VERTE
- PROJET NTIC ET GESTION DES CATASTROPHES (Direction Régionale Protection Civile)
- PROJET JEUNESSE AU TRAVAIL
- PAPAM

- PROJETS PAM,
- COMMISSARIAT A LA SECURITE ALIMENTAIRE
- PROJET JIGUI SEME JIRI
- PROGRAMME REGIONAL D'APPUI A L'ELEVAGE AU SAHEL (PRAPS)
- IPRO REAGIR
- FONDS NATIONAL D'APPUI A l'AGRICULTURE/MDR
- PROJET DE CONSTRUCTION DE BARRAGE SUR LE YAME A GOUNDAKA
- PROJET D'AMENAGEMENT DE LA PLAINE DE SABE
- IFDC/DRA
- OFFICE RIZ-MOPTI

III. Atelier communal de FATOMA

Activités à mener

- Conformément à notre PDSEC, les activitées préconisées sont les suivantes :
- Aménagements hydro-agricoles ;
- Plantations d'arbres ;
- parcs de vaccination des animaux,
- création de pistes pastorales,
- programme de renforcement des capacités, sensibilisation,
- maraichage, surcreusement de mares, empoissonnement de mares,
- puits pastoraux,
- riziculture fluviale,
- foyers améliorés ;
- Réalisation d'un canal d'évacuation d'eaux usées sur 5 Km à Fatoma.

Projets d'ancrage

- Résilience (Croix Rouge)
- Projet d'appui au développement d'agroforesterie familiale (Planète verte)
- Résilience, AGR, BC (PARMELM)
- PADIN (Care)
- Formation, insertion, emploi des jeunes (Maison familiale)
- APALEF (maraichage)
- Résilience, Environnement (Action Mopti)
- Environnement, pastoralisme (PROTOS)
- Résilience (Save the Children)
- Agrofoiresterie (Planuètre Urgence)
- Sécurité Alimentaire (PAPAM)
- Résilience (WAAP)
- PDD-DIN (Reboisement)

- NEF (Résilience)

Coûts des activités

Les coûts indicatifs doivent être disponibles avec les projets cités (surtout à Bamako).

IV. Atelier communal de PIGNARI BANA

Activités à mener

- Surcreusement de la mare de Bandiougou et Construction d'un pont barrage sur cette marre. Cet ouvrage permettra (i) d'éviter l'inondation de plusieurs villages dont Fiko, Kora, Kangila, Tangadouga et Pigna ; (ii) de stocker de l'eau pour ces mêmes villages et de nombreux autres villages des communes voisines de Fotama et de Socoura ; (iii) de promouvoir dans tout le cercle de Bandiagra de nombreuses AGR (maraîchage, pisciculture, élevage, …).
- Plantations des arbres,
- construction de cordons pierreux et/ou de diguettes,
- construction de barrage à Niandari .

Projets d'ancrage

- YA-G-TU
- Planète Urgence
- Aide Action
- PAM
- FAO

Coûts des activités

Les coûts indicatifs doivent être disponibles avec le projet PDIN et les services techniques à Bamako.

ANNEXES

1. **Résultats du choix de communes vulnérables aux inondations à Mopti**
    - **COMMUNES PROPOSEES PAR LES DIFFERENTS GROUPES ET CRITERES DE CHOIX:**

GROUPE I :

- COMMUNE DE PIGNARI BANA (7/23 villages victimes de l'inondation)
- COMMUNE SIO (6/20 villages victimes de l'inondation)

GROUPE II :

- COMMUNE DE SIO (commune ayant été victime de façon continue les inondations 2013-2014-2015 Somadougou)
- COMMUNE DE FATOMA (commune ayant été victime de façon continue des inondations 2013-2014-2015 Gninagou)

GROUPE III :

- COMMUNE DE PIGNARI BANA (exposition aux risques climatiques, un exemple représentatif du plateau dogon)
- COMMUNE DE FATOMA (exposition aux inondations)

CHOIX DE LA REGION DE MOPTI

- La Commune de Pignari Bana dans le cercle de Bandiagara,
- La commune de Fatoma dans le cercle de Mopti.

2. **Guides d'entretien par Localités**
    - Mopti
    - Fatoma
    - Pignari Bana (Goundaka).
3. **Liste de présence par Localité**

Au service des peuples et des nations

ATELIER REGIONAL DE MOPTI: PPG – GESTION DES RISQUES CLIMATIQUES ET D'INONDATIONS

LISTE DES PARTICIPANTS RESIDENTS A FATOMA CERCLE DE MOPTI

Date : vendredi 06 novembre 2015

N°	Nom et Prénoms	Téléphone	N° pièce d'identité	Service et Email	Signature
1	Allaye Sidibe	66220623	1029/SP-CFKB		
2	Moussa Dembogueme	76067039	081/SP-CFKB		
3	Moussa Keita	62022184 ~~69540466~~	177/BMS		
4	Oumar Sidibe	69540466	283/SP-CFKB		
5	Oumar D Tangara	66226367	547/SP-CFKB		
6	Yaya Diawara	65719128	385/SP-CFKB		
	Modibo Kone Togo	76145351	0586/SPACM	S/P- Fatoma	
	Bomagan Maiga	69838383	547/SP-CFKB	Maire Fatoma	

PNUD
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Agence de l'Environnement et du Développement Durable
AEDD

N°	Nom et Prénoms	Téléphone	N° pièce d'identité	Service et Email	Signature
7	Boubacar Bolly	66226847	3640/CPS		
8	Alhousseiny Keita	65887647	2444/SP-CFKB		
9	Mohamoue Lamar	64040527	CP 10MM		
10	Bakari Konaate	76230624	0055/SP.CFKB	DTC Komakebakan Fatoma	
11	Samboura Kida	63506056	489/SP-CFKB		
12	Allaye Diarra	66621803	638/SP-CFKB		
13	Boubacar Doulare	66416767	724/SP-CD		
14	Sekou Doumbia	76031674	2537/SP-CFKB		
15	APHO Doguon	73623040	2601CPS		
16	Modibo Diakité	66842127	2411/BFM		
17	Fadalmadou Koumbet Manga	63372339	533/SP-CFKB		
18	Madiou Onojoiba	99738941	208/SP-CFKB		

Au service des peuples et des nations

Agence de l'Environnement et du Développement Durable AEDD

ATELIER REGIONAL DE MOPTI: PPG – GESTION DES RISQUES CLIMATIQUES ET D'INONDATIONS

LISTE DES PARTICIPANTS NON RESIDENTS A FATOMA CERCLE DE MOPTI

Date : vendredi 06 novembre 2015

N°	Nom et Prénoms	Téléphone	N° pièce d'identité	Service et Email	Signature
1	Ramon Keita	76 30 86 25	0010		
2	ALY Dia	76031909	3043/CPS	7603	
3	Oumarou A. Maiga	63697800	570/SP.CKIB	oumarou.maigaalanane@yahoo.fr	
4	Oumarou Maiga	65817515	0129225.C	gregor_apec@yahoo.fr	
5	Oumar B. Sankare	98000670	298/SP-CFKB		333
6	Ibrahim Maiga	69608119	1368/CPS		Maiga

Au service des peuples et des nations

N°	Nom et Prénoms	Téléphone	N° pièce d'identité	Service et Email	Signature
7	Amadou Cisse	66015232 ~~2443/B7~~	2443/B TBoni		
8	Binta N'Diaye	76549469 ~~390/SP.CFKB~~	390/Sp.CFKB		
9	Coumba Traoré	63698760	2622/CPS		
10	Amadou Coulibaly	63867800	485/BR Sevare		
11	Moumouni Damango	76051924			

Au service des peuples et des nations

Agence de l'Environnement et du Développement Durable

ATELIER REGIONAL DE MOPTI: PPG – GESTION DES RISQUES CLIMATIQUES ET D'INONDATIONS

LISTE DES PARTICIPANTS

Date : Mercredi 04 novembre 2015

N°	Nom et Prénoms	Téléphone	N° pièce d'identité	Service et Email		Signature
1	~~Daouda SOUGOULE~~	~~66 79 10 97~~	~~4769/CPN~~			
2	Ada ~~SAO~~	74 07 29 37	0460/CPS	adasou33@yahoo.fr		
3	Almahadi MAIGA	66 85 18 49	1228/BRS			
4	Tahirou MAIGA		1116/CPS			
5	Mamadou Aliou BAH	63 14 90 14	517/BR-S	DREF-Mopti mamadoualiou bah 500@yahoo.fr		
6	Kéou MINTA	66 95 98 11	0542/CPS	Keoupinta@yahoo.fr		
7	Mamadou NIMAGA	78 24 16 67	308/BFM	DRH-Mopti nimagamadou177@yahoo.fr		

PPG_ RESIDENTS A SEVARE

Au service des peuples et des nations

N°	Nom et Prénoms	Téléphone	N° pièce d'identité	Service et Email		Signature
8	Bakary DAOU	66 97 37 99	3736/CPS			
9	Diakaridia NIANGALY	66 22 00 31	0250/AS-14	Mairie Sacpfoanara		
10	Ibrahima S FOFANA	76 43 11 14	1739/CP-S	Wetlands Infor (ofofana@) wetlands-africa.org		
13	Allaye TRAORE	76 14 37 17	325/BMS	Genie Rural Mopti		
15	Oumar DIARRA	79 44 44 88	012066/4A	DRPIA odiarra82@yahoo.fr		
16	Ibrahima DIAWARA	79 07 98 57	0856/CPM-14	ibraza26@yahoo.fr		
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19	Bakary DAO	66 97 37 99	3736/CP-S	Conseil Regional bakarydao@yahoo.fr		

Au service des peuples et des nations

N°	Nom et Prénoms	Téléphone	N° pièce d'identité	Service et Email		Signature
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21	Ilias SANTARA	66 00 64 15	177091011006077 P	CARE MALI Mopti santeanctions@yahoo.fr		
22	Amadou COULIBALY	79 02 13 97	086 /BTA -S	DRS Mopti amadoucoulibaly87@yahoo.fr		
23	Amadou DIALLO	64 57 37 67	6983/CP-S	Académie diallbambagana@yahoo.fr		
24	Bamagan MAIGA	90 66 66 66	547/SP-CFRB	Mairie Fatoma magamaiga.ama@yahoo		
25	Mahamadoun MAIGA	75 18 48 31	5939/CPACM	CRS_Mopti mahamadoun-maiga@crs.org		
26	~~Ada SAO~~	~~74 07 29 37~~	~~0460/CPS~~			
27	Almahadi MAIGA	66 85 18 49	1228/BRS			

Au service des peuples et des nations

N°	Nom et Prénoms	Téléphone	N° pièce d'identité	Service et Email		Signature
28	Tahirou MAIGA		1116/CPS			
29	Mamadou Aliou BAH	63 14 90 14	517/BR-S	DREF mamadoualioubah 50@yahoo.fr		

Au service des peuples et des nations

ATELIER REGIONAL DE MOPTI: PPG – GESTION DES RISQUES CLIMATIQUES ET D'INONDATIONS

LISTE DES PARTICIPANTS

Date : Mercredi 04 novembre 2015

N°	Nom et Prénoms	Téléphone	N° pièce d'identité	Service et Email	Signature
1	Moumouni DAMANGO	76051924	3622/SPACM	gmoptic@yahoo.fr	
2	Mahamadou TEMBELY	69 19 49 14	PM N°249035	Gouvernorat - Mopti -	
3	Djeneba KEMESSO	79 29 71 08	03577/SPACM	Gouvernorat Mopti dkemesso3@yahoo.fr	
4	Almamy OUARE	66 78 94 66	2003/CPM-14	Association des Hamdallaye associationdeshamdallayes@hotmail.com	
5	bdoulaye GUINDO	75 08 21 25	03870/SPA-CM		
6	Delphine DAKOUA	63 63 06 42	2329/SP-G	Sous-préfet Gourdaka Commune pignari-Bana	

Au service des peuples et des nations

N°	Nom et Prénoms	Téléphone	N° pièce d'identité	Service et Email		Signature
7	Youssouf CAMARA	66 80 75 44	01652/SPACM	DRP-M	Youssouf camara1@yahoo.fr	
8	Tiédo DIALL	62 21 68 59	0605/BTM	ASPROFER	11	
9	Moussa GORO	66 78 29 22	0330/BTA-S	personne ressource Fatoma		
10	Alassane BALLO	66 78 58 35	0857/AS-14	S/P Sanfaramaya		
11	Modibo Kane TOGO	76 14 53 51	0586/SPACM	S/P Fatoma		
12	Abdoulaye Bine GUINDO	66 56 72 54	03870/SPACM	PDD-DIN abdoulayebine@yahoo.fr	abdoulayebine@yahoo.fr	
13	Badara Alou COULIBALY	66 62 64 30	2837/CP-S	DRPSIAP Mopti	coulibalybadra68@yahoo.fr	
14	Abdoulaye GUINDO	66 56 72 54	03870/SPACM	Préfecture Mopti	— 11 —	

Au service des peuples et des nations

N°	Nom et Prénoms	Téléphone	N° pièce d'identité	Service et Email		Signature
15	Aboubakar BOCOUM	69 56 42 41	1184/CPS	Jeune Rue	Agenda@74	
16	Aldia DIALLO	76 07 99 61	613/SP-G	1e Adjoint Maire	Rignari. Bano	
17	Malic KOUMARE	76 11 78 20	2267/SPACM	Inspection Police		
18	Daouda SOUGOULE	66 79 10 97	4769/CPN	GJAM	Jeunesgaimopie@hotmail.fr	
19	Bakary SINAYOKO	66 90 44 34	0161/			

Au service des peuples et des nations

ATELIER REGIONAL DE MOPTI: PPG – GESTION DES RISQUES CLIMATIQUES ET D'INONDATIONS

LISTE DES PARTICIPANTS NON RESIDENTS A PIGNARI-BANA COMMUNE RURALE DE GOUNDAKA CERCLE DE BANDIAGARA

Date : samedi 07 novembre 2015

N°	Nom et Prénoms	Téléphone	N° pièce d'identité	Service et Email	Signature
1	Karembé Elhadj Moussa		992/PS-G	chef de village Bandiougou	
2	Karembé Sékou	63620474	2397/SP-G	président ASACO Bandiougou	
3	Traoré Sékou	66776057	166052160050017	Représentant jeunesse	
4	Tanapo Aly Amadou	96-51-02-15	822/SP-G	chef de village Kowa	
5	Hamdia Traoré	66841933	169052160050014	chef de village Fecko	
6	Karembé Modibo	65617969	462/SP-G	chef jeunes maraicher/Commune	

Au service des peuples et des nations

N°	Nom et Prénoms	Téléphone	N° pièce d'identité	Service et Email	Signature
7	Kansaye Bani	65820408	016/BFM	chef de village de Péron	
8	Karembé Amadou	60800392	163052160210044 K	chef de Village Tangadouba	
9	Karembé Hamidou	66374099	156052160070028	chef de village Kansila	
10	Tembely Ambara Diadié	65688468 76436597	1913. C.P. Bgara	YAGT-TU (ONG)	
11	Dakono Delphine	63630642	2329/SP-C	Sous-préfet Goundaka	

Au service des peuples et des nations

ATELIER REGIONAL DE MOPTI: PPG – GESTION DES RISQUES CLIMATIQUES ET D'INONDATIONS

LISTE DES PARTICIPANTS RESIDENTS A PIGNARI-BANA
COMMUNE RURALE DE GOUNDAKA CERCLE DE BANDIAGARA

Date : samedi 07 novembre 2015

N°	Nom et Prénoms	Téléphone	N° pièce d'identité	Service et Email	Signature
1	Boureïma Traoré	62-70-82-76	283315P-G	chef de village de Goundaka	
2	Diallo Oumar	66-80-78-63 73-64-14-56	N°M^le 1000	chef de poste eaux et forêt Goundaka	
3	Dembelé Karim	65-88-32-75 72-08-27-57	499ISP-G	chef de poste medical Goundaka	
4	Berthe Diakalia	65-64-52-75 79-34-21-84	512/SP-G	chef sous secteur Agriculture	
5	Diakité Houssein	65-80-96-36	824ISP-G	Vaccinateur Elevage	
6	Traoré Fatoumata		466ISP-G	Representante des femmes	
7	Sidibé Aboubacar	63-69-63-91	5927	chef poste securité Goundaka	
8	Dakouo Delphine	79-08-60-27	232915P-G	Sous prefet Goundaka	

N°	Nom et Prénoms	Téléphone	N° pièce d'identité	Service et Email	Signature
9	Karembé Hamadoun	76-05-41-03	946/SP-G	Maire de Pignari-Bana	
10	Diallo Aldia	7607-99-61	613/SP-G	1e Adjoint au Maire	
11	Degoga Issiaka	75 22 1611	859/SP-G	planteur Goundaka	
12	Degoga Seydou Guima Degoga Nouhoum	63089870 66565183	087/SP-G 609/SP-G	Cultivateur Goundaka cultivateur Gofundaka	
13	Kodio Adama	65763146	533/SP-G	Education Goundaka	
14	Diarra Mahamadou	75-05-49-16 63-97-25-57	529/SP-G	Régisseur de Dépenses P-Bana	
15	Diarra Souleye	62-98-37-16	004/SP-G	Paysant Goundaka	
16	Daba Namoudou Makan	63-76-24-80	315/SP-G	Eleveur Goundaka	
17	Tamboura Brahima	65-88-03-41	2295/CPS	Rep Association Goundaka	
18	Keita Kamissa	75-85-17-07	262052160010042	Accoucheuse au CSCOM Goundaka	
19	Kassogué Antiamba	76180751	17805201 002 003X	Regisseur de recettes Pignari-Bana	
	Dakouo Ouo Justin	75327561	316/SP-G	Agent pignari-Bana	

Stakeholder	Total	Number of women	% of women

consultation	number of attendees	women who attended meeting	representation
Sévaré (regional) 04 Nov 2015	41	4	10
Fatoma 06 Nov 2015	31	4	13
Goundaka 07 Nov 2015	32	5	16

Appendix 13: Maps.

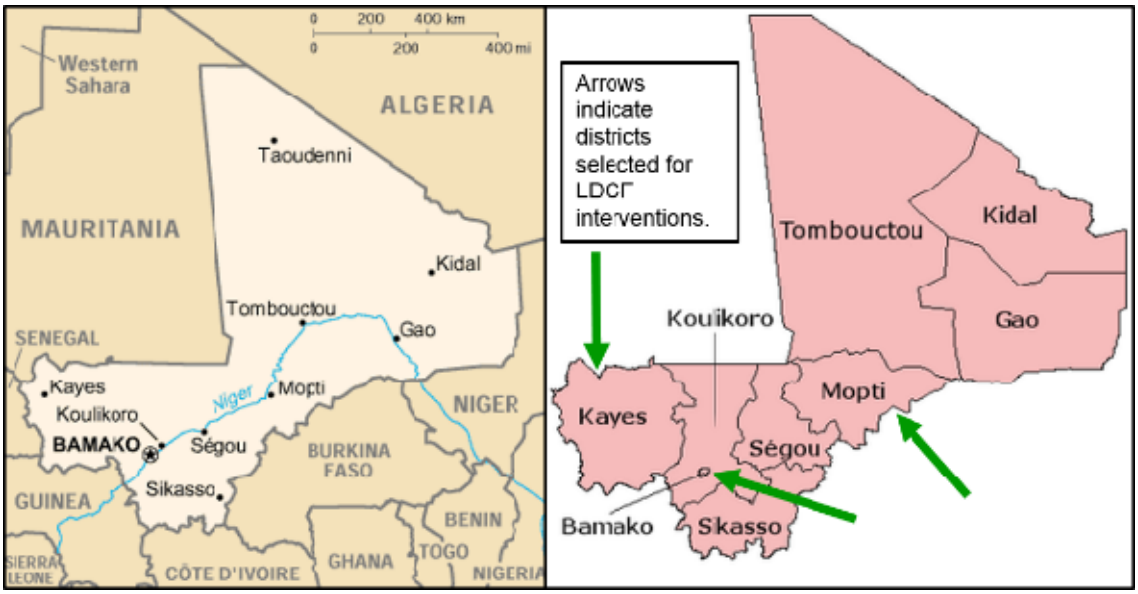

Figure 1. Left: Map of Mali in context with the surrounding countries. Right: Mali's intervention districts indicated with green arrows – Bamako, Kayes and Mopti.

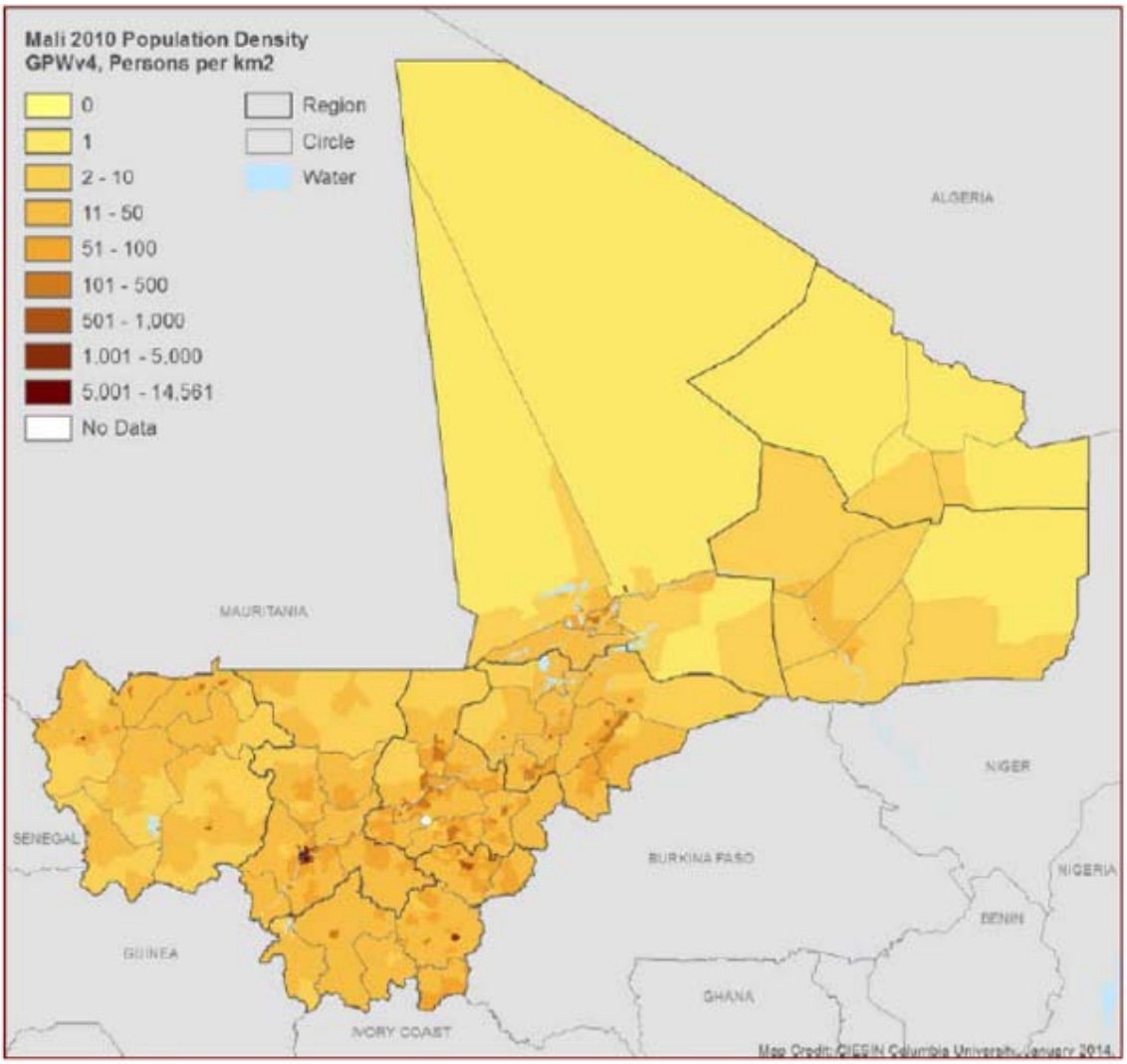

Figure *2*. Population Map of Mali (extracted from USAID 2014 Mali Climate Vulnerability Mapping).

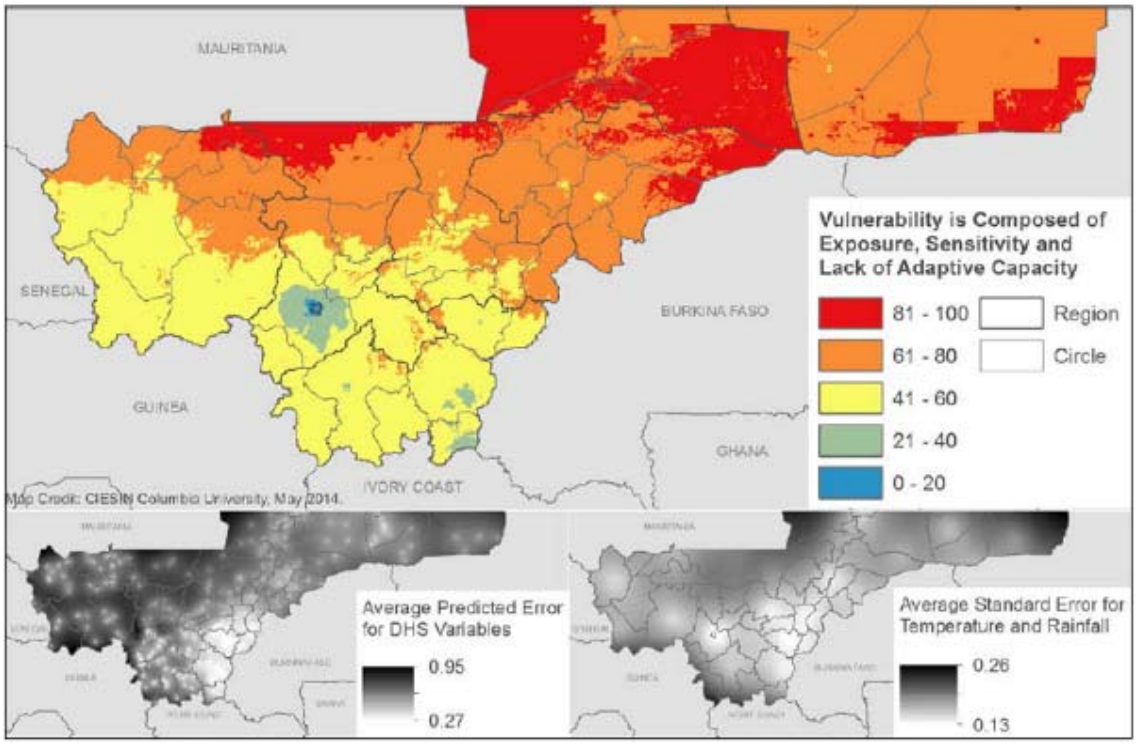

Figure 3. Overall Vulnerability Index (extracted from USAID 2014 Mali Climate Vulnerability Mapping).