

REPUBLIC OF MALI
One People – One Goal – One Faith



**Africa Hydromet Program:
Phase I - Mali Country Project**

**ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK –
including
Environmental and Social Impact Assessment and
Environmental and Social Management Plan**

ENGLISH TRANSLATION BY THE WORLD BANK

The original version in French is available at

<http://documents.worldbank.org/curated/en/2016/05/26399241/mali-first-phase-climate-resilience-sub-saharan-africa-environmental-assessment-cadre-de-gestion-environnementale-sociale>

Prepared and approved by the Government of Mali
Cleared and disclosed by the World Bank
as required for the purpose of the Funding Proposal to the Green Climate Fund for the Africa Hydromet
Program: Phase 1 - Mali Country Project

May 2016

TABLE OF CONTENT

| | | |
|-----------|--|-----------|
| | ABBREVIATIONS | iii |
| 1. | INTRODUCTION | 1 |
| 1.1. | Context, problematic and objectives of the project..... | 1 |
| 1.2. | Objectives and Modalities of the ESMF..... | 2 |
| 1.3. | Methodological approach of the ESMF..... | 3 |
| 2. | PRESENTATION OF THE PROJECT | 4 |
| 2.1. | Summary of the project | 4 |
| 2.2. | Objectives of the project | 4 |
| 2.3. | Project components description..... | 4 |
| 2.4. | Project Financing..... | 6 |
| 3. | BIOPHYSICAL AND SOCIO-ECONOMIC CONTEXT OF THE PROJECT AREA | 7 |
| 3.1. | Geographical location and biophysical context of Mali..... | 7 |
| 3.2. | Socioeconomic and human environment..... | 9 |
| 3.3. | Environmental and social major challenges | 11 |
| 3.4. | Vulnerability and disaster risk country profile..... | 11 |
| 3.5. | Food Security related to Risks and Disasters | 14 |
| 4. | ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK POLICY | 16 |
| 4.1. | The Poverty Reduction Strategic Framework | 16 |
| 4.2. | National Environmental Protection Policy..... | 16 |
| 4.3. | The national strategy for disaster risk reduction..... | 16 |
| 4.4. | Sectoral Policy of Urban Development (SPUD) | 18 |
| 4.5. | Strategy for the Development of Cities in Mali..... | 18 |
| 4.6. | Decentralization and Planning Policy | 18 |
| 4.7. | The National Water Policy (NWP)..... | 18 |
| 4.8. | The National Sanitation Policy (NSP) | 19 |
| 4.9. | National Biodiversity and Conservation Strategy | 19 |
| 4.10. | The National Forest Policy | 19 |
| 4.11. | National Policy on Climate Change of Mali (NPCC) | 19 |
| 4.12. | The National Health and Environment Policy | 20 |
| 4.13. | The National Cartography and Geographic Information Policy | 20 |
| 4.14. | National, Regional and Local Plans Related to Disaster Risk Reduction and Preparedness | 20 |
| 4.15. | National Action Plan for Adaptation to the Adverse Effects of Climate Change (NAPA) | 20 |
| 5. | LEGAL FRAMEWORK OF THE ENVIRONMENTAL AND SOCIAL MANAGEMENT | 21 |
| 5.1. | Conventions, Treaties and International Agreements..... | 21 |
| 5.2. | National Legal Texts Applicable to the Project..... | 21 |
| 5.2.1 | The Constitution..... | 22 |
| 5.2.2 | National Legislation on the Environment and the Protection of Natural Resources | 22 |
| 5.2.3 | Specific Land Management Legislation | 23 |
| 5.2.4 | Legislation Specific to the Study of Environmental Impacts | 23 |
| 6. | INSTITUTIONAL framework FOR PROJECT environmental MANAGEMENT | 25 |
| 6.1. | Ministry of the Environment, Sanitation and Sustainable Development | 25 |
| 6.2. | The Ministry in Charge of Domain and Population Resettlement Policy..... | 25 |
| 6.3. | Other Institutions involved in Environmental and Social Management of the Project..... | 27 |
| 6.4. | Territorial Collectivities | 27 |
| 6.5. | Analysis of the environmental and social management capabilities in the project..... | 27 |
| 7. | SAFEGUARD POLICIES OF THE WORLD BANK | 29 |
| 7.1. | OP/BP 4.01: Environmental Assessment | 29 |
| 7.2. | OP 4.12: Involuntary Resettlement Population..... | 29 |
| 8. | POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS | 30 |
| 8.1. | Positive environmental and social impacts of the project..... | 30 |
| 8.2. | Negative environmental and social impacts | 30 |
| 8.3. | Risks related to installation and maintenance of hydro-meteorological stations | 31 |
| 8.4. | Other negative impacts | 32 |

| | | |
|----------------------|---|-----------|
| 8.5. | Synthesis of negative environmental and social impacts..... | 32 |
| 9. | MITIGATION MEASURES OF NEGATIVE IMPACTS | 33 |
| 10. | ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) | 36 |
| 10.1 | Methodology for the preparation, approval, and implementation of subprojects | 36 |
| 10.1.1. | The process of environmental and social screening of project activities..... | 36 |
| 10.1.2. | Responsibilities for the implementation of the environmental and social screening | 38 |
| 10.2. | Responsibilities for the implementation of the environmental and social screening | 39 |
| 10.3. | Analysis of environmental and social capacities – capacity building measures..... | 39 |
| 10.4. | Recommendations for the environmental and social management project..... | 39 |
| 10.4.1. | Institutional strengthening measures | 39 |
| 10.4.2. | Technical Capacity measures | 40 |
| 10.4.3. | Training measures for actors..... | 40 |
| 10.4.4. | Information and awareness of people in the project area | 41 |
| 10.4.5. | Compliance measures with the Environmental and Social Safeguard Policies..... | 41 |
| 10.5. | Environmental and social monitoring program..... | 41 |
| 10.5.1. | Monitoring and Evaluation | 41 |
| 10.5.2. | Institutions responsible for monitoring | 41 |
| 10.5.3. | Monitoring Indicators | 41 |
| 10.6. | Institutional arrangements for the implementation and monitoring..... | 45 |
| 10.6.1. | Coordination, preparation and supervision during construction..... | 45 |
| 10.6.2. | Implementation and close monitoring | 45 |
| 10.6.3. | Environmental and social monitoring..... | 46 |
| 10.7. | schedule of measure implementation | 46 |
| 10.8. | Estimated cost of environmental and social measures..... | 46 |
| 11. | CONCERTATION WITH STAKEHOLDERS | 47 |
| 11.1 | Organization | 47 |
| 11.2. | Results..... | 47 |
| 5. | CONCLUSION..... | 49 |
| ANNEXES | - 1 - | |
| Annex 1: | Environmental and Social Selection Form | - 2 - |
| Annex 2: | Environmental and social clauses | - 4 - |
| Annexe 3: | Environmental and Social Safeguard Policies of the World Bank..... | - 8 - |
| Annexe 4 : | Environnemental Licence | - 10 - |
| Annex 5: | List of generic mitigation measures | - 12 - |
| Annex 6: | Bibliography | - 15 - |
| Annex 7: | Resource persons in Bamako | - 16 - |

ABBREVIATIONS

| | |
|--------|--|
| ACMAD | African Centre of Meteorological Application for Development |
| ADCP | Acoustic Doppler Current Profiler |
| AEDD | Agency for Environment and Sustainable Development |
| AIDS | Acquired Immune Deficiency Syndrome |
| BP | Bank Procedures |
| CBO | Community Base Organization |
| CCD | Convention to Combat Desertification |
| CRP | Climate Resilience Project |
| DHS | Demographic and Health Survey of Mali |
| DRR | Disaster Risk Reduction |
| EIA | Environmental Impact Assessment |
| ESIA | Environmental and Social Impact Assessment |
| ESIN | Environmental and Social Impact Notice |
| ESDA | Environment and Sustainable Development Agency |
| ESFP | Environment and Social Focal Point |
| ESIA | Environmental and Social Impact Assessment |
| ESMF | Environmental and Social Management Framework |
| ESMFP | Environmental and Social Management Framework Plan |
| ESMP | Environmental and Social Management Plan |
| EWS | Early Warning System |
| FSC | Food Security Commission |
| GCF | Green Climate Fund |
| GDCP | General Directorate of Civil Protection |
| GDP | Gross Domestic Product |
| HIV | Human Immunodeficiency Virus |
| ICFDS | Inter-State Committee for the Fight against Drought in the Sahel |
| IDDWS | International Decade of Drinking Water and Sanitation |
| IPE | Individual Protective Equipment |
| MCAT | Ministry of Culture Arts and Tourism |
| MDGs | Millennium Development Goal |
| MES | Ministry of Environment and Sanitation |
| MESSD | Ministry of Environment Sanitation and Sustainable Development |
| METO | Ministry of Equipment, Transport and Opening up |
| MHLAUP | Ministry of Housing, Land Affairs and Urban Planning |
| MSPLA | Ministry of State Property and Land Affairs |
| MWA | Mali Weather Agency |
| NAP / | National Action Plan to Combat Desertification |
| NAPA | National Action Plan for Adaptation to the adverse effects of Climate Change |
| NBA | Niger Basin Authority |
| NCBPRD | National Capacity Building Project in the Reduction of Risk Disaster |
| NCFDL | National Centre for the Fight against Desert Locust |
| NDA | National Directorate of Agriculture |
| NDH | National Directorate of Health |
| NDH | National Directorate of Hydraulic |
| NDSPNC | National Directorate of Sanitation and Pollution and Nuisance Control |
| NDTPH | National Directorate of Town Planning and Housing |
| NDWF | National Directorate of Water and Forests |
| NEAP | National Environmental Action Plan |
| NEAP | National Environmental Action Plan |
| NFCS | National Framework for Climatological Services |
| NGO | Non-Governmental Organization |
| NPEP | National Policy for Environmental Protection |
| NRME | Natural Resources Management and Environment |
| NSP | National Sanitation Policy |
| NWP | National Water Policy |

| | |
|--------|---|
| OP | Operational Policy |
| OPS | Outline of planning Strategy |
| PHSD | Public Hygiene and Sanitation Division |
| PMU | Project Management Unit |
| RAP | Resettlement Action Plan |
| RDSPNC | Regional Directorate of Sanitation and Pollution and Nuisance Control |
| RLA | Regional and Local Authorities |
| RMD | Risk Management and Disaster |
| RMD | Risk Management and Disaster |
| RPF | Resettlement Policy Framework |
| SFGPR | Strategic Framework for Growth and Poverty Reduction |
| SFPR | Strategic Framework for Poverty Reduction |
| SSO | Sahara and Sahel Observatory |
| STI | Sexually Transmitted Infection |
| TDO | Tender Document Offers |
| TOR | Terms of Reference |
| UIDP | Urban Infrastructure Development Project |
| WB | World Bank |
| WHO | World Health Organization |

EXECUTIVE SUMMARY

The World Bank is seeking the Green Climate fund accreditation on a grant to the Government of Mali to implement a project in that country within the African Hydro-meteorological Program (Strengthening the Resilience Climate of the Sub-Saharan Africa). Mali faces the extreme and varying climatic conditions that cause droughts and floods frequently. It is predictable that climate change will create more frequent and severe events. Better weather and climate information is required, both at national and individual levels so that the government, communities and the public sector can better plan and adapt to these changes.

The Government of Mali recognizes that strengthening the country's economic growth and addressing poverty reduction in a meaningful manner will require addressing climate and disaster risk. The Strategic Framework for Growth and Poverty Reduction identifies climate risks such as significant barriers to addressing poverty reduction in the country. The Mali-Weather Agency, the National Directorate of Hydraulics (NDH), the General Directorate of Civil Protection (GDPC) and the Early Warning System (EWS) to the Food Security Office (FSO) are the main institutions of meteorology, hydrology, climate, and disaster risk management in Mali.

The use of weather and climate information is currently minimal. The proposed project aims to enhance the adaptive capacity and climate resilience of vulnerable communities and the economy of Mali in developing the capacities of hydro- meteorological services and alert. This will in turn support the adaptation planning for current and future users of public and private sectors. The project includes four components and will be implemented for 5 years. The expected result is the optimum use of hydro -meteorological services, reducing the risk of disasters and food security. The total project cost is estimated at **27.25 million US dollars**.

This Environmental and Social Management Framework (ESMF) prepared for the above-mentioned Project, aims to define guidelines to ensure that the selection, evaluation and approval of sub-components (or sub-projects) and their implementation are both consistent with the policies, environmental laws and regulations of Mali and environmental safeguard policies of the World Bank. The methodology consisted of the collection and analysis of specific documentation of Mali and in parallel with the operating policies of the World Bank. A broad consultation with all stakeholders of the project was conducted on the field.

Mali is an exclusively continental territory of which 2/3 are arid and semi-desert. The country has a relief composed of plains and plateaus. The climate is hot and dry with high temperatures and low and variable rainfall. Surface water resources are mainly distributed between two rivers, some lakes and ponds. Groundwater contributes about 80-90% of the population water supply. Arable land represents less than half of the country's area. The forest area consists of reserved forests, protected areas and agricultural or anthropogenic vegetation covering about 26% of the territory, Wildlife includes all types of large mammals and birds of the African savannah. The bird life is rich, with 640 species recorded, including 15 rare.

The Malian population density is highly variable. The population is mostly rural and very poor. The enrollment of boys is still greater than that of girls. Mali's economy is based primarily on the service sector and agriculture. The natural resource degradation process is characterized by strong pressure on forest resources following the agricultural clearing and timber extraction which is the main source of domestic energy. The water and wind erosion, overgrazing, misuse of space, land insecurity, lack of adequate infrastructure and uncontrolled urbanization are also major environmental and social challenges. Mali is particularly vulnerable to drought, locust invasion and floods. The vulnerability is due mainly to its isolation, its climate (alternating periods of drought and intense rainfall) and especially to poverty.

The legislative and regulatory context of the environmental sector and project intervention areas is marked by the existence of the relevant texts and a number of strategic planning documents. National legislation on environmental assessments provides a similar categorization to 4.01 policy of the World Bank, but the procedure leading to this classification is not determined. At the institutional level, efforts are still needed in terms of integration of environmental aspects in the preparation, implementation and monitoring of sub-projects, but also the capacities and coordination. This concern should be strengthened within this project framework.

Because of environmental and social impacts that may result from the implementation of project activities, two safeguard policies of the World Bank are involved, notably the OP 4.01 "Environmental Assessment" and the OP 4.12 "Involuntary Resettlement". The GDPC proposed compliance measures of the project to the triggered policies. Other operating policies of the World Bank will not apply to this project.

The project activities are likely to cause negative impacts on the biophysical and socioeconomic environment. The main actions concerned the construction of hydro-metrological stations and the construction or rehabilitation of infrastructure. The Analysis of negative impacts is focused primarily on those investments.

In total, the negative impacts identified are small scale but they concern a wide range of sectors. Without being exhaustive, some can be mentioned like loss of land and socio-economic activities; deforestation by felling down trees; soil erosion; pollution and nuisances, waste generation and the risk of accidents at work; the risk of disruption of spawning grounds in the case of piezometers presence in watercourses; etc.

The Project is category B according to the criteria of the World Bank, the negative impacts are localized. Thus, certain activities must be of an ESMP before starting or an Action Plan for Resettlement in the event of involuntary displacement. The main recommendation in this context relates to the strict application of international standards. The environmental and social management of the project activities also requires strengthening of institutional measures, but also technical training, information and awareness, monitoring / evaluation. The overall cost of implementing the ESMP activities is estimated at **245 million FCFA** (about **425 000 \$US**) to be integrated in the project costs.

The GDCP provides environmental and social screening process for all sub-projects to be implemented. This process describes the different steps (preparation, monitoring of the implementation), including institutional responsibilities. This selection process is designed to: (i) determining which actions of the project are likely to have negative impacts at environmental and social level; (ii) determine the mitigation of impacts of such actions; (iii) identify activities requiring separate ESIA; (iv) describe the institutional responsibilities for analysis and approval of the results of the selection, the implementation of proposed mitigation measures, and the preparation of separate EIA reports; (v) monitoring of environmental parameters during construction and in the course of some pilot operations of the projects; and (vi) indicate activities of the CRP that may involve land expropriation.

Management and environmental and social monitoring of the project will be provided by the PFES GDCP, with recipient agencies under the supervision of NDSPC who will receive project support for this. Implementation of environmental and social measures is the responsibility of contractors in the form of ESMP-Enterprise (ESMPE). The environmental and social monitoring should be done by NDSPC and GDCP; evaluation will be undertaken by independent consultants.

1. INTRODUCTION

1.1. Context, challenges and objectives of the project

The World Bank is seeking the Green Climate Fund support for a grant to the Government of Mali to implement a project in that country within the African Hydro-meteorological Program - Strengthening the Resilience Climate of the Sub-Saharan Africa.

Mali is a Sahelian country that already faces extreme and varied weather conditions. It is predictable that climate change will create more frequent and severe events. Better weather and climatic information is required, both at the national and individual levels so that the government, communities and the public sector can better plan and adapt to these changes.

Mali is vulnerable to drought. Between 1980 and 2014, the country suffered many droughts, with more than 3.5 million people affected in 2011. Recurrent droughts have also led to major northern population migration to the south and intensified the exploitation of low floodplains for agriculture, especially for rice cultivation.

Floods are common in Mali. From 1980 to 2007, 15 major floods have occurred each time affecting from 10 000 to 45 000 people. These floods occurring in rural as in urban and peri-urban are usually due to overflowing rivers and canals handset malfunction or the absence of drainage systems.

In 2003, floods killed 20 people, destroyed 6,052 houses and damaged 12,000 hectares of farmlands as well as roads and bridges. The damage is valued at over 3.8 million euros in 2002 and 5.9 million euros in 2003 with a total cost for 2002, 2003, 2007 and 2008 of 15 million euros.

The 2013 floods demonstrated the increasing vulnerability of urban areas of Mali to flood events. In the capital Bamako, torrential rains and the lack of adequate drainage infrastructure have triggered flash floods, causing the death of 37 people with more than 20 000 displaced.

Natural disasters (drought, floods and locust invasions) and other factors such as the lack of arable land, environmental degradation and the high fluctuation prices of consumer goods has led Mali to face many challenges in terms of food security and public health. This is particularly real for vulnerable rural households that depend on subsistence farming and agro-pastoralism

The report "Climate Vulnerability of Mali prepared in 2014 for USAID by TetraTech ARD shows that Mali has an inherent vulnerability to climatic events that could be exacerbated by future climate change. An increasing number of extreme weather events such as droughts and floods are expected in the coming decades.

The Government of Mali recognizes that strengthening the country's economic growth and significant poverty reduction will require the consideration of climate risk and disaster that are associated. The Strategic Growth and Poverty Reduction Framework (SGPRF 2007-2011), adopted by the Council of Ministers of Mali in December 28, 2011, is the reference for the formulation and implementation of economic and social policies. The plan specifically identifies the risk of floods and drought leading to food insecurity as the major obstacles to reducing poverty in the country.

The integration of adaptation to climate change also has a prominent place in the Sustainable Recovery Plan of Mali (SRP 2012 - 2013) and the Government Action Plan (GAP 2013-2018).

In this context, the Mali-Weather Agency (MWA), the National Directorate of Hydraulics (NDH), the General Directorate of Civil Protection (GDGP) and the Early Warning System (EWS) to the Commissioner of Food Security (CFS) are the key institutions responsible for meteorology, hydrology, climate, and management of disaster risk in Mali.

However, previous and recent assessments confirmed through direct technical discussions with these institutions, constitute severe obstacles in the provision of hydro-meteorological services to potential users, public and private sectors and at the level of communities especially:

- For MWA and NDH:
 - shortage of qualified staff and lack of personnel policy and continuing education;
 - weakness of institutional capacities including partnerships and service delivery procedures;
 - poor overall condition of the main observation infrastructures;
 - unreliable and slow communication systems specially to reach sparsely populated regions;

- limited storage and management data capacity;
 - low capacity in terms of meteorological and hydrological forecasting.
- For the EWS:
 - Low integration of urban and suburban areas;
 - inadequate collection systems and information management;
 - Communication impaired of the early warnings and direct action with the affected populations.
 - For the GDCP:
 - the tools currently available for the GDCP do not permit effective implementation of its coordination mandate, promotion and the facilitation interventions in key sectors involved in the management of disaster risk, particularly in connection with the warning flood / inundations;
 - the insufficient capacity of GDCP for emergency response and the coordination of preventive activities among different sectors.

Because of this, the use of weather and climate information is currently minimal in Mali. This Environmental and Social Management Framework (ESMF) established for the Project aims to define guidelines to ensure that the selection, evaluation and approval of sub-components (or sub-projects) and implementation comply with the laws, policies and environmental regulations of Mali, as well as political environmental safeguards of the World Bank.

1.2. Objectives and Modalities of the ESMF

The ESMF is a tool to identify and assess potential environmental and social impacts. Its objective is to establish a process of environmental and social selection that will enable structures in charge of the implementation of the project, from the planning stage, to identify, assess and propose measures to mitigate potential environmental and social impacts related to project activities

The Environmental and Social Management Framework (ESMF) defines the framework for monitoring and surveillance as well as institutional arrangements before, during and after project implementation and achievement of activities to mitigate adverse environmental and social impacts, to eliminate or reduce acceptable levels.

Also, the ESMF describes the different stages of the environmental and social screening process to determine the class of sub-projects and to decide whether to carry out environmental and social impact assessment (ESIA), or just apply simple mitigation measures of impacts using an environmental and social list, or if the sub project can be executed without any study or specific actions. The ESMF also determines the institutional arrangements for the implementation of the program. The structures responsible for the project implementation will use the environmental and social screening process proposed in order to identify and assess environmental and social impacts at the planning stage.

The ESMF accordingly determines training needs, capacity building and other technical assistance for the implementation of the measures.

The Environmental and social review procedure of ESMF will be integrated with the approval procedure and the general financing of sub-projects, and will be conducted under the laws of Mali and the Safeguards Policies of the World Bank. The ESMF will also support in the consultation process to ensure that the various stakeholders and those affected are informed of the project objectives and their concerns are adequately addressed.

In summary, the Environmental and Social Management Framework (ESMF) will therefore assess, widely and prospectively for each sub-project, the environmental and social impacts of proposed activities include a project evaluation grid and mitigation measures, compensation, support and capacity building.

An Environmental and Social Management Plan (ESMP) will also be prepared to ensure effective implementation of the activities of sub-projects that would be available with more information (known activities

and identified sites). These plans describe the particular environmental and social impacts of each of these activities and specific measures put in place for the mitigation of these impacts.

The potential social impacts will be identified according to their natures supported by the Resettlement Policy Framework (RPF) developed as a separate document for the project.

The preparation of this ESMF was carried out and the development of a document for the Resettlement Policy Framework of the Populations (RPF) should be prepared. The RPF will study in detail the terms of treatment and compensation of persons likely to be affected by the implementation of subprojects. The Resettlement Policy Framework (RPF) will define the principles of the resettlement and compensation and institutional arrangements set up for activities that require land acquisition leading to the physical movement of people, and / or loss of homes and / or loss of income sources, and / or loss of restrictions on access to economic resources. The Resettlement Plans will be prepared for activities whose sites are known. These plans describe notably specific measures to put in place to compensate people affected by the project (PAP).

1.3. Methodological approach of the ESMF

The first step involved the collection and analysis of the literature on the project environment, the context, the laws and regulations governing the environment in general and land management in particular in Mali, the environmental policies and resettlement policies of populations in Mali and in parallel with the operating policies of the World Bank. Such as:

- characterize the legal and regulatory framework for managing environmental impacts and sort the comparison with the policies of the World Bank;
- identify contemplated sub-project, the positive and negative impacts on the socioeconomic environment, especially local residents, as well as the biophysical potential sites for implementation of the various sub-projects / activities;
- propose generic measures of managing potential negative impacts, as well as recovery measures and reclamation of positive impacts;
- propose explicit procedures and methodologies for social and environmental planning as well as for the evaluation, approval and participatory implementation of activities related to the operations to be financed under the project;
- clarify institutional roles and responsibilities for ad hoc implementation of the ESMP, and outline the procedures mandatory reporting to manage and monitor the environmental and social concerns for these activities;
- identify the needs for capacity building and other technical assistance for the proper implementation of the provisions of the ESMF both at national and local levels;
- estimate the funding amount to be filled by the project to implement the activities proposed by the ESMF. The consultant will assess and internalize the costs of ESIA and ESMP specific subprojects and those of implementing mitigation and compensation measures proposed on the basis of similar experiences (similar projects in neighboring areas) and;
- provide the adequate information means adapted to sustainably implement the recommendations of the ESMF;
- submit the ESMF to different stakeholders involved in its validation and adoption.

The ESMF will include a procedure for analyzing and sorting which will determine, each proposed subproject: the operational guidelines of the World Bank that could be applied and the levels / types of environmental analyzes are required. For example, a complete environmental and social assessment (ESIA) including an environmental and social management Plan (ESMP), an ESMP only, or a simple application of good practices of construction and operations. the ESMF also define the content type of each instrument and describe the terms of its preparation, review, approval, and monitoring of its implementation.

2. PRESENTATION OF THE PROJECT

2.1. Summary of the project

Table 1: Synoptic view of parts of the project

| | |
|--|---|
| Project Title: Capacity building of hydro-meteorological services in Mali | |
| Intervention sector | Climate Change Adaptation |
| General objective | Increase the resilience of Mali to climate risks and disasters, through the strengthening of national institutions responsible for meteorology, hydrology and alert. |
| Specific objectives | The specific objectives of the project are improvement of early warning capacities for food security and nutrition, development of capacities related to early warning for extreme events (e.g. heavy rain, urban floods, winds, etc.) finally ownership, improvement and operationalization of contingency plans and emergency organization plans. |
| Partners / Implementing agencies | The Mali-Weather Agency, the National Water Directorate (NWD), the General Directorate of Civil Protection (GDPC) and the Early Warning System (EWS) to the Office of Food Security (OFS). |
| Financing | Green Climate Fund, World Bank and Government of Republic of Mali. |

2.2. Objectives of the project

The proposed project aims to enhance the adaptive capacity and climate resilience of vulnerable communities and economy of Mali in strengthening the capacities of hydro-meteorological and warning services. This will in turn support the adaptation planning for current and future users of public and private sectors.

2.3. Project components description

This project is part of a wider investment program supported by donors in the energy sector. It will be implemented over a period of 5 years and includes the following four components:

- **Component A** - Capacity and institutional development of Mali-Weather Agency, of the National Directorate of Hydraulics (NDH), the Early Warning System (EWS) and the General Directorate of Civil Protection (GDPC). It will finance the following activities:
 - **Activity 1:** Training and capacity building programs for agencies' staff and management: Develop and implement a capacity building, training and education program including: (i) personnel training and retraining; and (ii) professional orientation for senior staff. Modalities of training would include in-situ training, education at universities, study tours, distance learning program and training in OMM regional and other relevant training centers. Areas of technical training will include at least basic meteorology, hydrology and ICT, maintenance and operation of newly acquired equipment, information and communication technology, data processing, analysis & management, geographical information systems and remote sensing. Targeted training programs will also be developed for specific agency needs, such as simulation exercises for DGPC, forecasting models for MWA and NDH, and livelihood impact analysis methodologies for EWS.

- **Activity 2:** Enhancing institutional and regulatory frameworks: Strengthen institutions of hydro-meteorology, food security and civil protection through institutional development and strategic planning for its prevention, the anticipation and urgent response to extreme hydro-meteorology events (fluvial floods, pluvial floods, wind, drought, bush fires etc.)
- **Activity 3:** support for integration, the coordination and the detailed technical specification of Project activities: This activity includes the detailed development of Project design, ensuring integration and interoperability of the systems

The expected result through the component A is capacity building and institutional development of inter-ministerial coordination in Mali- Weather Agency (MWA), National Directorate of Hydraulic (NDH), the Early Warning System (SAP) and the General Directorate of Civil Protection (GDCCP).

- **Component B** –Modernization of observation infrastructure, forecasting, warning and response. It will finance equipment and infrastructure for improvement:
 - **Activity 1:** Improved transmission of data collection, prediction and decision support systems by updating the data collection and equipment and communication devices, data storage and management systems, computers and software for remote sensing, as well as custom software and GIS tools.
 - **Activity 2:** The physical and software infrastructure for data analysis and decision support. Through the expansion and improvement of hydro-meteorological observation networks, (Automatic Meteorological stations, rain gauges, lightning detectors, standard equipment, power supply, telecommunications to the stations, etc.), the agro-meteorological network of hydrological stations (of automatic step recorders) and specialized hydrological equipment (ADCP, bathymetric instruments, measuring instruments sediment, etc.), for rivers and small watershed lines at flooding risk.
 - **Activity 3:** The response means to improve civil protection, food security and nutrition.

The expected result through the component B is the modernization and sustainable operation of the data collection infrastructure and management and access to information systems in the four targeted institutions

- **Component C** - the improvement of the delivery of services to end users, will fund the following activities:
 - **Activity 1:** Establishment and operational implementation of the National Framework for Climatological Services (NFCS), assessing users' needs across different sectors and detailed planning to respond.
 - **Activity 2:** Improved forecasting and warnings of droughts and floods and developing new products for the specific needs of sectors such as agriculture, health, energy, water resources, the management of disaster risks
 - **Activity 3:** Enhancing connectivity of the "last kilometer" to enable an understanding and effective use of information, and (v) community awareness and establishing effective feedback procedures for those at risk
 - **Activity 4:** Mobilization and sensitization of communities at risk: Community capacity building, gender and youth group sensitization will take place through workshops.

The expected result is the optimum use of hydro meteorological services, reducing the risk of disasters and food security by users of different sectors across all existing distribution channels and dissemination in Mali (traditional, newsletters, internet, television, radio, SMS) and through all available devices (agricultural cooperatives, municipal committees, suppliers, etc.).

A Management and Coordination Unit at the General Directorate of Civil Protection will implement the project, which is under the Ministry of Security and Civil Protection. This unit will coordinate field operations through accountability of existing structures.

- **Component D.-** Project management

This component will include support all four entities for Project coordination, monitoring and evaluation, reporting, financial management, procurement and environmental and social safeguards, technical and financial audits, development of Project implementation manuals, and communication materials.

2.4 Project Financing

The project is prepared by the Government of Republic of Mali and presented to the GCF by the WB seeking a donation of about **22.75 million US dollars**. The total project cost is estimated at **27.25 million US Dollars** for the four components for a period of ten years (Table 2).

Table 2: Cost of components of the proposal of Mali project to GCF (in millions of US dollars)

| Component | Activities | Total cost | GCF cost |
|--|---|--------------|--------------|
| Capacity building and institutional development | Training of staff and experts | 2.5 | 2.5 |
| | Strengthening the institutional and legislative framework | 0.6 | 0.6 |
| | Support for integration, coordination and technical specification | 2.0 | 2.0 |
| Modernization of observation infrastructure, forecasting, warning and response | Improved transmission of data collection, prediction and support systems for decision | 5.3 | 4.5 |
| | Expansion and Improvement of hydro-meteorological observation networks | 1.8 | 1.5 |
| | Response means | 7.5 | 5.15 |
| Increased service delivery and warnings to users | Establishment and operational implementation of the National Framework for Climatological Services (NFCS) | 2.65 | 2.25 |
| | Improved forecasting and warnings of droughts and floods | 2.25 | 1.8 |
| | Enhancing connectivity "last kilometer" | 0,65 | 0.5 |
| | Mobilization and sensitization of the communities | 0.45 | 0.45 |
| Project Management | | 1.55 | 1.5 |
| Total Project | | 27.25 | 22.75 |

3. BIOPHYSICAL AND SOCIO-ECONOMIC CONTEXT OF THE PROJECT AREA

3.1. Geographical location and biophysical context of Mali

Mali is a Sahelian country located in West Africa. The Sahel is a wide band (400 to 500 km wide) of a dozen countries south of the Sahara, stretching about 5500 km along the Atlantic Ocean covering approximately 3 million square kilometers. It is a transition zone between the Sahara Desert to the north and Sudan area in the south.

Geographic and administrative situation: Mali is a sparsely populated, predominantly dry country with a land area of 1,241,248 km², representing 4.2% of the total area of Africa. 2/3 of the country are arid and semi-arid desert. It is a country of plains and plateaus with a slightly undulating profile. The average altitude is 500 m. between 10 ° and 20 ° North latitude and 120 ° West and 4.5 ° East longitude. As a landlocked country, Mali shares more than 7000 km of land boundaries with seven bordering countries, including: Algeria to the north and northeast, Niger to the east, Burkina Faso to the southeast, Côte d'Ivoire to the south, Guinea to the southwest, and Senegal and Mauritania to the west. The country is divided into eight administrative regions and 703 communes were created.

Climate: Mali has a hot and dry climate, with temperatures averaging between 35 ° (May-June) and 22 ° C (December-January). The average annual precipitation varies from 100 to 1,300 mm according to the specific ecological zones. The climate of Mali is often divided into three zones. The 2/3 of the Northern Territory is entirely deserted and belonged to the southern Sahara with extremely low annual rainfall (about 127mm. The Sahel region in the center of the country is too dry (very low rainfall) while the South Sudan region is relatively watered with rainfall that could reach 1400 mm per year in some places before 1970 (Figure 1).

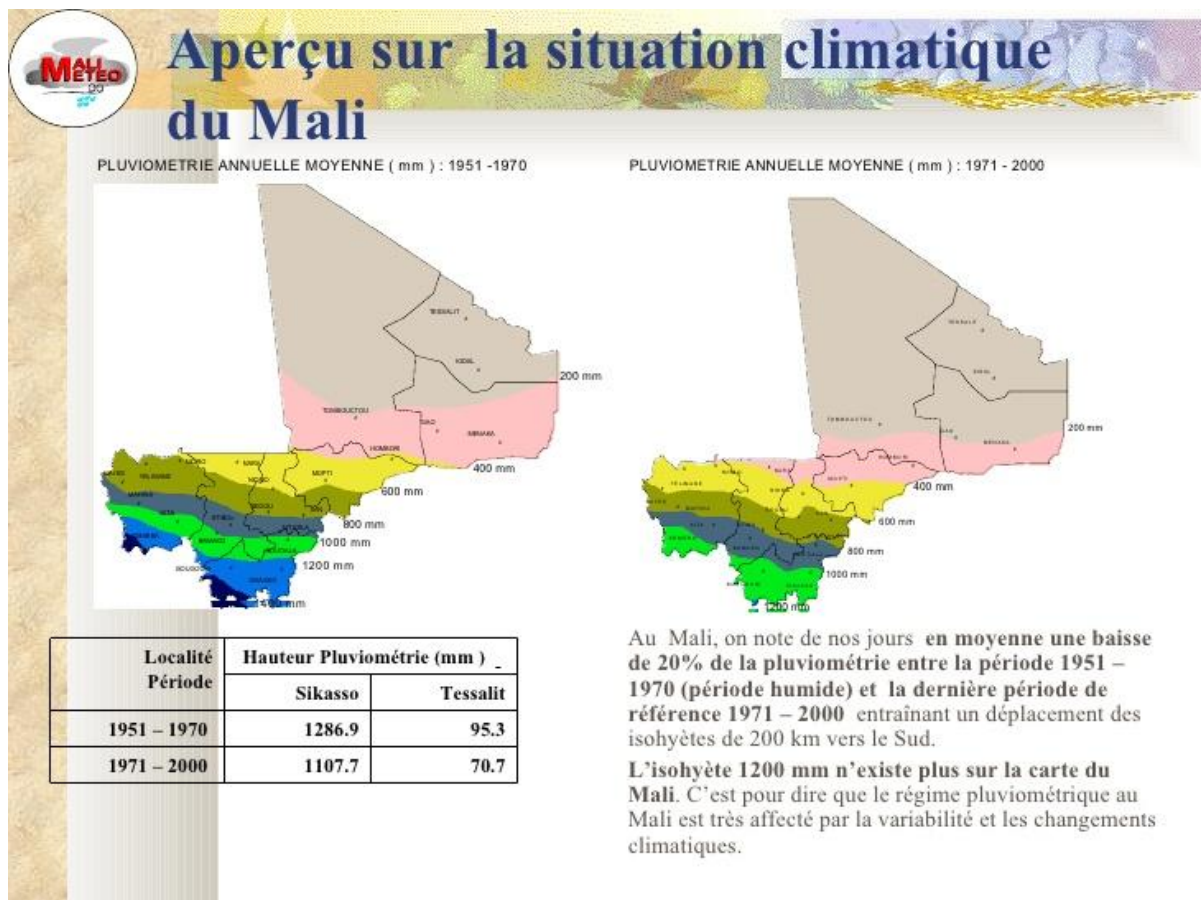


Figure 1. Evolution of rainfall in Mali (DNM, 2006)

Agro-climatic zones: The country is divided into four climatic zones: (i) the southern Sudano-Guinean zone between latitudes 12-14; 75,000² km or 6% of the national territory (this is the wettest of the country with a rainfall of between 1300 mm and 1500 mm of water per year; (ii) the North - Sudanian zone, with 1300 mm and 700 mm / year of water. This area covers approximately 18% of the Sudanian territory, with a much more dense vegetation cover: savanna woodland and forests); (iii) the Saharan zone: between latitudes 18-20; 632.000 km² or 51% (100-200 mm of rainfall per year with low vegetation cover consisting primarily of thorn-bush); (iv) the Sahelian zone: between latitudes 16-18; 320,000 km² or 26% (precipitation there varies from 200 to 700 mm per year and the vegetation is thorny and Acacia steppe-type), and contains the Interior delta of the Niger. The Interior delta of the Niger (also called lake zone or flooded zone) is the place of rice cultivation and fishing.

Water resources: Mali's surface water resources are essentially divided between two major rivers, several lakes and a few marshes. Hydrographic regime essentially consists of the upper Senegal and Niger basins. The northern part of the country is drained by the Senegal River and its tributaries, while the eastern part is drained by the River Niger and its tributaries. The Senegal River takes its source in Mali at the convergence of two rivers (Bafing, Bakoy) and the Niger (4 200km of which 1780 in Mali). The water that is distributed by the supply networks comes too from rivers. Also, from North to South, a quarter of the territory is located in the Sudano-Guinean, 50% area in the box Sahelian and 25% in the Sahara Desert. A total of 17 lakes are located along the lower course of the River Niger in the northern parts of Mali. 80-90% of the water supply originates from ground water.

Soils: There are ten major soil groups in Mali, based on geomorphology, geology as well as morphological and chemical properties. These soils cover 583,000 km² south of the Sahara Desert, ie 47% of the total area of the country. Three types of soils dominate all the arable land in Mali. First, slightly ferralitic soils cover about 20,000 km² of the Guinean zone in the extreme south of the country. The moderate fertility of these soils is partly compensated by their depth. Then, the tropical ferruginous soils predominate in the Sudanian zone and on two-thirds of the Sahelian zone, covering a total area of 173,000 Km². These fertile soils are moderately vulnerable to erosion. Finally, vertisol and hydromorphic soils occupy the Delta of the Niger River and the alluvial valleys of the country.

Vegetation: The bulk of the wood of the national forest resources, estimated at 100 million ha, about 32.4 million ha, or approximately 26% of the surface area, with 1.3 million ha of forest classified and 3.9 million ha of protected areas (1.5 million ha in Mopti and 1.75 million ha in Gao), to which the plantations and the agricultural land must be added, it is estimated at 15.7 million ha (Figure 2).

The flora of Mali has a wide variety of species related to changes in environmental conditions across the country. A total number of 1,739 spontaneous woody species distributed among 687 genera from 155 families Eight species are endemic in Mali (*Maerua* of *waillyi*, *Elatine fauquei*, *Pteleopsis habeensis*, *Hibiscus pseudobirtus*, *Acridocarpus monodii*, *Gilletiodendron glandulosum*, *Brachystelma medusanthemum*, *Pandanus raynalii*). To preserve the forest formations, the state has gradually established a classified forest network. It has developed management plans for some of them.

Fauna: Mali has a great potential in the field of wildlife due to the ecologic diversity of the country and the abundance of vegetation in some agro-ecological zones. This fauna includes all types of large mammals and birds of the African Savannahs. The bird life is particularly rich, with some 640 identified species, of which 15 are rare. The main migratory species are the Summer teal (*Anas quesquedula*), the Pintail (*Anas acuta*), the Shoveler duck (*Anas chrypeata*) and the nyroca Filicule (*Aythya nyroca*). The recovery of ringed birds in the Delta revealed that these migrants evolve between Mali and more than 18 countries in Europe, Africa and Asia. The Inner Niger Delta, which spans 40,000 km², is a very particular wetland. It includes three Ramsar sites of international importance: the Walado Debo, Lake Horo and the Seri plain recognized as world heritage to keep, about 162,000 ha. It houses nearly 350 species alone, of which 108 are migratory.

The country' fauna is now in decline or even extinction of species such as *Damaliscus korrigum*, *Taurotragus derbianus*, *Giraffa camelopardalis reticulata*, *Gazella dMMAab*, *Oryx algazella*, *Addax nasomaculatus*, *Acinonyx lervia*, *Choeropsis liberiensis*, *Acinonyx jubatus*, *Lycan pictus*, *Trichechus senegalensis*, *Manis spp.*, *Orycteropus afer*, lion, elephant, chimpanzee, jackal, spotted hyena, bushbuck.

3.2. Socioeconomic and human environment

The macroeconomic context of Mali is marked in 2014 by a consolidation of the recovery with a real GDP growth rate of 5.8% against 1.7% in 2013. This growth is driven by the primary sector (9.4%), thanks to the performance of agricultural sub-sector (an increase of 13%), a result of a good campaign. The activity was also motivated by the service industry (4.8%), with a surge of activity in the transport and telecommunications (7.4%) and trade (3%). In return, the secondary sector experienced a contrary-performance in 2014 (1.8% against 5.5% in 2013), even if the food industries, energy and building and public works (BPW) recorded increases of 12.2%, 10% and 5% respective thanks to the economy recovery. The current account deficit (including grants) worsened in 2014 (6.2) compared to 2013. In perspective, it will improve over 2015 and 2016. This trend is explained by the decrease in import values, due to fallen prices of petroleum products hence an improvement in terms of trade.

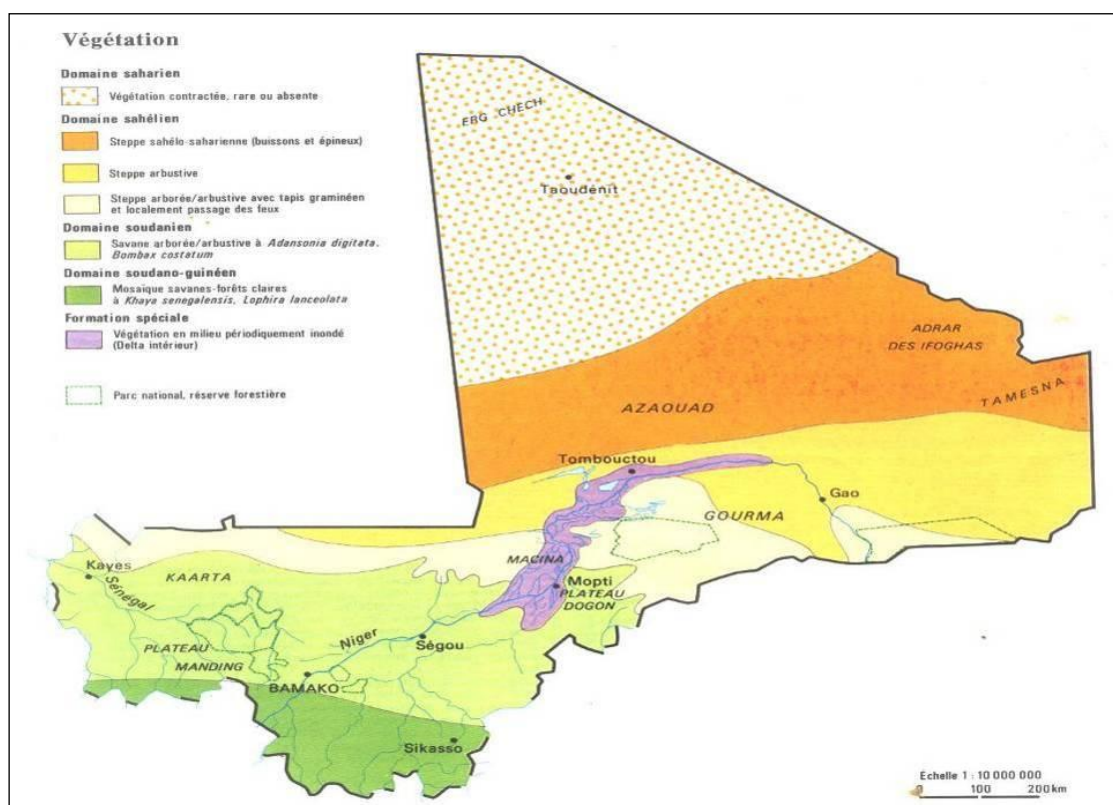


Figure 2 : Vegetation of Mali (Source: PNAE/PAN-CID, 1998, Mali)

With a Human Development Index (HDI) of 0.407 in 2014, Mali was ranked 176th over 187 countries worldwide. The crisis of 2012 resulted in lower funding development activities and reduced business activity. The consequence is an increase of precariousness in households and an increase in the incidence of poverty that has reached 47.1% in 2013. The rural medium contributes 91% to the incidence of poverty at the national level. Mali has little chance of achieving the target of 34.7% of the population living below the poverty line in 2015.

The medium-term macroeconomic outlook is favorable: the economic recovery should continue in 2015 and 2016 with real GDP growth rate of 5.4% and 5.1%. This growth should again be driven by the agricultural and tertiary sectors, in addition to the massive return of technical and financial partners (TFP). The recovery is expected, particularly in the BPW and services, with respective growth rates of 5.6% and 7% in 2015. The current account deficit (including grants) is projected to improve marginally to 5.5% of GDP in 2015. It should be financed by foreign direct investment (FDI) in the gold sector and telecommunications, as well as external assistance in loans. However, the same risks persist, could hamper these perspectives. The main causes are the volatility on prices of gold and cotton, the two main export products, and the fragile security situation in the country.

The prevalence of underweight decreased from 33% in 2001 to 25.5% in 2013. Mali has made significant efforts to achieve the target of 26.8%. However, chronic malnutrition (stunting) in children under 5 years remained stable at 38.3%. It is estimated that in 2013, 35% of child deaths are associated with Malnutrition¹. However,

despite the difficult context, Mali has been able to achieve the target C of MDG which was to reduce by half, from 2000 to 2015, the proportion of people who suffer from hunger.

Displaced and refugee populations are having problems with their children schooling, which resulted in part a decline in attendance with an impact on the national level. The gross enrollment rate in the first primary cycle has decreased from 79.8% in 2011 to 72.3% in 2014, of which 70.4% for the girls. The net enrollment rate was 55.4% in 2014 thus 53.6% for girls. It exceeds 70% in urban areas while it is only about 50% in rural areas. The target of a net enrollment rate in primary and secondary schools 100% for both sexes was not attained in 2015.

The parity index girls-boys in education has increased from 0.82 in 2011 to 0.85 in 2014. In addition, women account for 2014, 1.13% of mayors, 8.60% of local councilors, MPs 9.52% and only 2% of party leaders. For appointed positions, in this period, the rate of women ministers has experienced a sharp decline numerically with 3 women ministers out of 29.

In 1991, upon 1 000 live births, 123 died before their first birthday (infant mortality) and 238 died before reaching the age of 5 (juvenile mortality). In 2013, infant mortality was reduced to 56‰ without achieving the target of 41.3‰ planned for 2015. The risks of child death are much higher in rural than urban areas. Indeed, in 2012 the infant mortality rate was 43‰ in urban areas and 68‰ in rural areas. As for juvenile mortality, it was down to 95‰ a decrease of 60‰, but still far from the target in 2015, which was 79.6‰. In rural areas, it is 113‰ against 64‰ in urban areas.

The maternal mortality rate is 368 per 100 000 live births (LB) in 2013, with a proportion of assisted deliveries attended by 58.6%. But there is a wide disparity of assisted delivery rates between urban and rural areas. In 2013, with 92%, the urban milieu has exceeded the target of 85% while the rural area was only 51%. Achieving the reduction target by ¾, between 1990 and 2015, the maternal mortality rate, that is to say, from 577 in 1990 to about 144 per 100 000 live infants in 2015, seems to be out of reach (Table 3).

The prevalence of HIV has decreased by 1.3% in 2006 to 1.1% in 2013. The prevalence was significantly higher in women than in men. The prevalence is twice as high in urban than rural areas.

Table 3: Key socio-economic data of Mali

| | |
|---|---------------------------------|
| Area | 1 241 300 km² |
| Total population (people, 2015) | 17 963 218 |
| Population density (inhabitants per km ²) | 14,46 |
| Rural population (% of total population), 2013 | 62 % |
| Population growth (annual %), 2013 | 3,6 % |
| Life expectancy at birth (2014) | 58 years |
| Maternal mortality rate (per 100 000 LB), 2015 | 368 |
| Infant mortality rate (per 1 000), 2015 | 41,3 |
| Gross enrollment rate in 2014 | 72,3 % |
| Parity Index Girls - Boys (2014) | 0,85 |
| Adult literacy rate (15 years), 2015 | 38,70 % |
| HIV prevalence (% of population aged 15 to 49), 2015 | 1,1 % |
| Population rate affected by food insecurity (2015) | 19,4 % |
| Rate of access to drinking water (2015) | 78,7 % |
| GDP (in US \$), 2014 | 12,07 billion |
| GDP per inhabitant (in US \$), 2014 | 690 |
| GDP growth rate (annual %, November 2015) | 5,8 |
| GNI per inhabitant (in US dollars, 2015) | 650 |

| | |
|--|--------|
| Poor rate according to the national level (2015) | 47,1 % |
| Unemployment rate (2015) | 10,3 % |
| Rate of ODA relative to GDP (2013) | 6,5 % |
| HDI (2014) | 0,407 |

(Sources: UNDP: RNS MDGs, ODD, 2015; ADB, 2015, IBRD-IDA / WB, 2016)

Bush fires are a serious call for concern. They consume annually about 14 million ha course to the detriment of pastoralism. The supply of drinking water had been significant progress before the crisis, 80.9% of households had access to a drinking water source in 2011. Today, the displaced and insecure areas are experiencing serious supply problems. The access rate decreased to 78.7% in 2014.

The humanitarian situation remains precarious in the north. The attacks multiply and persist fighting against the positions of the Malian army, integrated multidimensional United Nations Mission for Stabilization in Mali (UNMSMA) and even between different armed groups. The situation results in serious problems of food insecurity and malnutrition, involving urgent need of food aid (about 1.7 million people including 260,000 in crisis). The return of refugees and displaced persons to their areas of origin cannot be done without difficult conditions. The Strategic Response Plan (SRP) developed by the humanitarian community in Mali in 2014 was estimated at 481 million USD.

3.3.Environmental and social major challenges

In Mali, the natural resources degradation process is characterized by strong pressure on forest resources with agricultural clearing, but also in socio-economic activities; significant levies on wood which is the main source of domestic energy; loss of soil fertility for crops caused by water and wind erosion; overgrazing. Regarding the preservation of the natural environment, the main threat comes from desertification due firstly to the importance of water and wind erosion and, secondly misuse of space by inadequate rural production systems.

Because of extensive deforestation, most of the country is prone to severe soil erosion; erosion and soil depletion (long remained without significant amendment) which constitute a limiting factor in agricultural productivity and soil depletion.

Strong pressure on forest resources is enormous: land clearing, overexploitation of fuelwood, bush fire, overexploitation of medicinal biomass overgrazing. This causes a loss of forest cover and trees, the decline in biodiversity, the threat of extinction of plant and animal species. We can admit that the degradation of forest stands has increased with the growth of urban population that generates a higher demand for energy wood in cities.

Although theoretically abundant resources in surface and ground waters are highly threatened, including industrial and domestic pollution, but also waste and the unsound management.

At the social level and the living environment, the major constraints include: land insecurity; the anarchic development of habitat; (With dramatic consequences, cf flood 2013 in Bamako with nearly 40 dead and thousands affected) the establishment of industrial units in residential areas; the deterioration in the quality and scope of urban and rural life; a notorious deficit of public facilities for sanitation; inadequate infrastructure and basic services in urban centers; wandering animals, the proliferation of uncontrolled dumps; lack of management of discharges from industry and crafts; air pollution (industrial emissions, etc.).

3.4.Vulnerability and disaster risk country profile

Vast Sahel countries representing 1 / 24th of the total area of Africa, Mali is exposed to various natural hazards, but is particularly vulnerable: the drought, locust infestation and floods 1. Its vulnerability is linked mainly to its isolation in the heart of West Africa between seven countries and its Sahelian climate, dry tropical, with great variability alternating drought and intense rainfall (Table 4). Vulnerability is also linked, in the rainy season, the flooding of two great rivers Niger and Senegal rivers and their tributaries, which are an important river system inscribed in huge watershed that Mali shares with twelve countries. Considerable potential groundwater exists but its operation is facing a very uneven spatial distribution and constraints of access to water, including depth of groundwater in some areas.

This physical vulnerability is exacerbated by social and environmental factors, including:

- the high dependence of agriculture, a key sector of the Malian economy, to an erratic rainfall;
- poverty still marked with a GDP per inhabitant estimated at 690 US dollars in 2014 and a Human Development Index (HDI) relatively low, ranking Mali 176th out of 187 countries (2014);
- the installation of the populations in flood zones formed by the ponds or the beds of rivers and streams, denoting a development problem of planning and land use;
- an environmental degradation.

Table 4. Effects caused by hazards and disasters in Mali

| Causes of vulnerability | Consequences |
|-------------------------|---|
| Floods | Loss of homes Drowning Death of livestock Destruction of crops Epidemics Pollution of wells |
| Bush fires | Destruction of forests and natural habitats Destruction of crops and harvests habitat destruction human and livestock losses Soil depletion |
| Drought | Loss of natural habitats Land degradation Drying up of rivers Famine / Death Malnutrition |
| locust invasion | Destruction of crops and harvests Famine |

Two thirds of the territory of Mali consist of desert areas (arid and semiarid) in the North, undergoing chronic drought since 1970. Mali is characterized by high spatial variability of temperature and rainfall. Normally, the temperature increases the Southwest to the Northeast with maximum observed during the year up to or exceed 45 ° C while the minimum rarely below 10 ° C. Rainfall has decreased from south to north over 1000 mm per year in the Sudano-Guinean zone South, less than 200 mm per year in the North Saharan zone. In addition, rainfall has a high inter annual variability resulting in recurrent drought years become increasingly frequent since 1968. In 27 years (1980-2007), the country experienced five major droughts. The persistent drought has caused a strong migration of northern populations to the south of the country, but also the practice of rain fed agriculture in the lowlands and flood valleys of rivers and backwaters especially for rice (Figure 3).

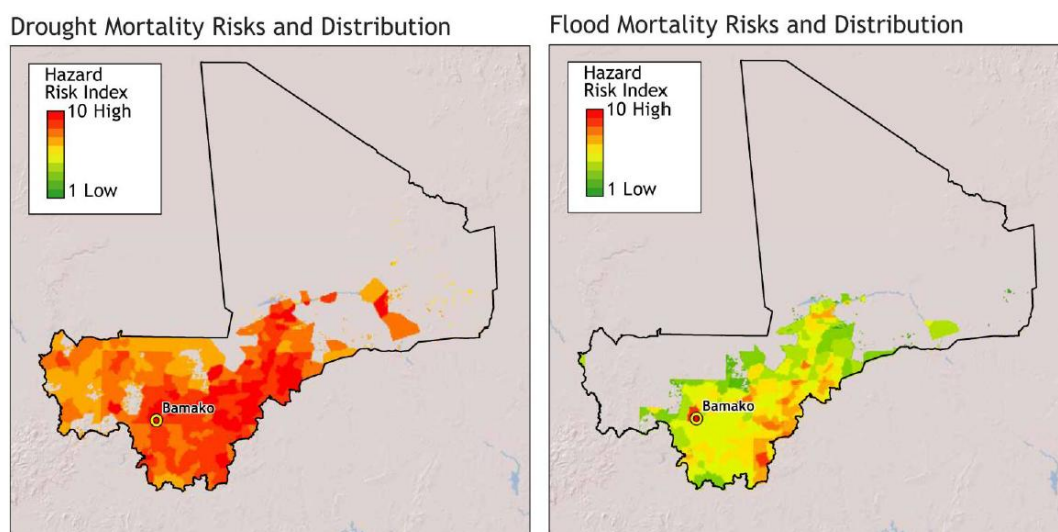


Figure 3 : Exposure to drought and flood hazards across Mali (USAID, 2014)¹

In 27 years (1980-2007) natural disasters including drought, floods and epidemics (malaria infections, water-borne diseases) affected nearly 3 million people and killed nearly 3,300 people in Mali. In 2003, floods have caused nearly 20 deaths, 6052 houses destroyed, 12,000 hectares of flooded fields and the destruction of roads and bridges. If in 2003, the floods have affected nearly 10 000 people, in 2007 they affected nearly 88 000 people. In 2013, the balance of floods in Bamako was officially as 37 deaths, many persons wounded and hundreds of houses destroyed or damaged. The main areas at risk of flooding are in the Inner Niger Delta River (64 000 km²), which is a particular ecosystem related to hydrography, ranging in strip along the Niger River. Besides the capital Bamako, the regions of Timbuktu, Gao, Mopti, Segou, Kayes, Sikasso and Koulikoro are among the most exposed. In 2004, some regions were heavily affected by the floods and locust invasion, including Koulikoro, Segou, Mopti and Timbuktu. The damage was very variable depending on the area, but millet, sorghum and cowpea were the most affected with respective losses of 37 000, 9000 and 3000 tonnes. The 2004 invasion have severely affected the economic growth of Mali, which was 2% on a forecast of 5%. The most significant droughts in 1980 and 2005 affected 1.5 million and 1 million people respectively with significant economic consequences.

Mali has undergone fifteen floods in 27 years (1980-2007), generally affecting 10 000 to over 45 000 people at each event.

Occurring in both rural and urban areas, floods are usually due to overflow and flood the rivers and streams (Figure 4), but also the failure of drainage systems. They follow generally heavy rainfall and are often linked to the base, to a failure of regional planning and the mastery of land use, with uncontrolled occupation of low flood fund, beds and basins of rivers and streams and their tributaries. The problems of environmental degradation and soil erosion and silting in response to deforestation and bush fires, constitute major underlying risk factors. Loss of significant arable land of around 6.5 tons / ha / year, ranging from 1 ton to the north to more than 10 tons in the South were observed.

¹ Cartographie de vulnérabilité climatique du Mali. USAID, 2014, 58p.



Figure 4 : Floods of 2013 and Rescue operations in Bamako by agents of GDCP

Mali has regularly suffered locust invasions, the most recent and most serious of 2004.

Mali is both a country of invasion and development of desert locusts. If the invasion concerns throughout the territory, the development of locusts relates to specific areas called "outbreak areas" which are places of regeneration and the usual habitats of desert locusts, mainly: The Adrar of Iforas (Kidal region) Timetrine (border with Algeria), Tamesna (border with Niger), Timbuktu and North East Valley Tilemsi. The invasion of 2004 undermined agricultural production targets of 30.2% compared to forecasts for the country and caused additional budgetary expenditure of 7 billion FCFA.

Like other Sahelian countries, Mali has experienced climate variability for years, even in normal times and this will accelerate in the future. Climate variability in Mali translates alternating wet and dry periods, which are respectively characterized by, low rainfall and relatively abundant rainfall compared to normal.

But Mali is also undergoing the phenomenon of climate change for several decades. Indeed, a downward trend of the average annual rainfall was observed over the period from 1921 until the 1980s the average rainfall increased from 700 mm per year between the years 1921 and 1941, 400 mm year to the 1980s Furthermore, analysis of reduced temperature anomalies, established on the basis of maximum temperature and minimum temperature data of 13 stations from 1961 to 2004, showed a downward trend of maximum temperatures and minimum from 1961 to 1986 and an upward trend in maximum and minimum temperatures from 1986 to 2004. the climate scenarios developed for Mali predict a temperature rise of over 2 ° C throughout the country for 2005 -2100. The persistence of drought in the 1970s has led quite significant rainfall deficits and changing isohyets south. The average flow of the Niger River, which reached 1 300 m³ in 1978 was only 895 m³ in 2002. Water resources and agriculture are among the most exposed to climate change sectors, with a forecast of widespread declines of returns between 2005 and 2025 (maize, river rice, cotton, millet / sorghum). Mali has been and will be constantly exposed to random and insufficient rainfall, but at the same time the successive floods, the frequency seems to grow more and more.

3.5.Food Security related to Risks and Disasters

The Forum on the tools of prevention and management of food and nutrition crisis in Mali was held in January 2016 under the auspices of the Food Security Commission, with technical and financial support of the European Union, WFP and FAO. The overall objective of this forum was to better understand the determinants of food insecurity in Mali and to define the most appropriate tools for the prevention and management of food crises in the light of new contexts and challenges in food security.

The objective of the Malian Government is to guarantee access to adequate food and quality to all citizens, indispensable condition for social justice and development. Rural development and food security are a priority area for EU cooperation in Mali and has received funding of more than 65 billion CFA francs for the 2014-2020 periods. The priorities of the EU in Mali revolve around:

- sustainable intensification of production and the development of agricultural products;

- reducing food insecurity and malnutrition;
- support for the governance of agriculture and food and nutrition security.

The reform of the National Food Security Device (NDSD) is engaged by the State with the support of its partners and recorded in the Memorandum of Understanding between the State and the TFP to strengthen the NDSD signed in November 2015. The reflection on the desirable development of intervention methods is inseparable from the current operationalization steps of the reform. A wide debate is open on the shape and quality of response to food crises and cyclical nutritional, while reflecting on their links with the issues related to strengthening the resilience of vulnerable populations and communities, reducing poverty and vulnerability and their inclusion in a development trajectory.

It follows eight major recommendations that are all important projects, linked to the evolution of crisis-management tools for prevention. These recommendations require monitoring, reflective thinking, and the development of appropriate action plans.

2. ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK POLICY

The policy of the environmental and social management in Mali is marked by several strategic documents, which challenge the Project, and foremost among which we note:

4.1. The Poverty Reduction Strategic Framework

The Strategic Framework for Growth and Poverty Reduction (SFGPR, 2012-2017) is the unique setting medium-term reference for Mali's Development Policy and the main repository for all technical and financial partners in their support for the country. Its central objective is "to promote sustainable growth and poverty reduction, by reviving the productive sectors and the consolidation of public sector reforms." More specifically, the CSCRП aims to accelerate economic growth at a rate of 7% per year (2007-2011) and to improve the well-being of the Malian people. The SFGPR prescribed in its priority areas of intervention: (i) environmental protection and better management of natural resources; (ii) the restoration and recovery of degraded areas and sites; (iii) the conservation, management of natural resources and wildlife; the fight against desertification. The 3rd CSCRП for the period 2012-2017 is being prepared.

4.2. National Environmental Protection Policy

The national environmental protection policy 'ensures a healthy environment and sustainable development by taking into account environmental issues in any decision affecting the design, planning and implementation of policies, programs and activities for development involving all relevant stakeholders'. Its implementation should make a significant contribution to the fundamental development questions, such as the fight against desertification, food security, the prevention and the fight against pollution, and poverty reduction.

Thus, its specific objectives are to: (i) develop and support the implementation of decentralized and participatory renewable natural resources management; (ii) to promote environmentally sustainable agricultural production systems; (iii) develop and support the implementation of participatory natural resource management programs to reduce the effects of degradation, desertification and/or drought; (iv) strengthen the fight against any form of nuisance and pollution; and (v) strengthen the capacities of the involved actors.

Implementing the policy takes place through 9 programs taking into account all of the conventions, treaties and international conventions ratified by Mali. These programs are: Country planning; natural resources management; water resources control; the living environment improvement program, development of new and renewable energy resources, environmental information management, program of information, education and communication environment: implementation of environmental conventions, agreements and treaties, research program on the fight against desertification and the protection of the environment.

4.3. The national strategy for disaster risk reduction

Mali, like other countries of the Sahel is exposed to the adverse effects of climate change, with its corollary of disasters that are desertification, drought, locust invasions, floods, etc. To this context, the State, NGOs, donors, communities and groups combine their efforts to prepare, organize, fight, and build their capacities for response and disaster resilience. Many vulnerabilities factors are due to the inequality and marginalization, which means that some regions and social groups are more vulnerable than others to the risks and are more strongly affected by its impacts.

Mali signed the Hyogo Framework for Action and appears to CAH2 as an acceptable example internationally. In its strategy to reduce disaster risk, some legislation and regulations have been developed and submitted for approval to the authorities. This concern the:

- Decree establishing the responsibilities, organization and functioning of the National Platform for Disaster Prevention and Risk Management;
- Decree adopting the Comprehensive National Contingency Plan;
- Decree adopting the Plan of Relief Organization (ORSEC Plan);
- Approval of the National Strategy for Disaster Risk Reduction;
- Approval of the National Communication Strategy on the prevention and management of disaster risks.

For the disaster and risk reduction (DRR), the following activities were carried out in 2014:

- development and validation of DRR training modules;
- validation of Curricula ;
- forums of South elected and those of the North;
- development and validation of ORSEC contingency and communal plans;
- development and validation of AP of the monitoring and management committees in Bamako I Council;
- the development and validation of the communal communication strategy;
- experience sharing workshop.

The actors and beneficiaries of the national strategy for disaster risk reduction are:

- General Directorate of Civil Protection (GDPCP);
- National Agency of Meteorology ;
- Agency for Environment and Sustainable Development;
- National Directorate of Hydraulics ;
- The Centre for against the Desert Locust;
- Commissioner for Food Security - Early Warning System (SAP CSA);
- National Department of Planning;
- Government agencies and departments;
- Civil society including NGOs and associations involved in the field of risk management of disasters;
- Industries and firms potentially vulnerable to disaster risks.

The difficulties encountered in the implementation of disaster and risk reduction strategy are:

- The vast national territory;
- Insecurity in the north, making it difficult missions and monitoring;
- Flood risks in all major cities due to the lack of reliable water drainage system;
- The continual degradation of the environment;
- The extreme poverty of the population;
- Low literacy and enrollment rates;
- Global warming ;
- The coordination of inter-agency actions;
- Difficulties in mobilizing members of the Evaluation Commission.

To cope with these difficulties, it has been envisaged:

- The return of the administration in the north to facilitate the tasks and monitoring of risk areas;
- The development of the banks of rivers and lowlands;
- The eviction of the occupants of river beds;
- The implementation of urbanization patterns;
- The implementation of the communication strategy on the P / GRC;
- Supporting people through the program to fight against poverty;
- Support for functional literacy;
- The effective coordination of actors SNRRC in reducing risks related to climate change.

Efforts by CPB in relation to other sectors have an awareness of the authorities and populations. Moreover, Mali receives financial support from the Global Device for Disaster Reduction and Reconstruction (GFDRR) managed by the World Bank for the implementation of "Disaster Risk Management Project and Adaptation Climatic changes ".

4.4. Sectoral Policy of Urban Development (SPUD)

The overall objective of the sectoral policy on urban development, which was adopted by the government on September 25 1996, is to create the conditions to improve the quality of life and particularly strengthen the fight against urban poverty based on decentralization as a general framework for action. Its implementation was projected through 3 specific objectives and 10 strategies:

- Objective N ° 1: create the conditions for better control urban growth;
- Objective N ° 2: contribute to the improvement of the living conditions in cities by strengthening the fight against urban poverty;
- Objective N ° 3: promote a greater valorization of the national cultural heritage for a more harmonious development of cities;

4.5. Strategy for the Development of Cities in Mali

For a sustainable urban development in Mali as stipulated by the *Sectorial Policy of urban development*, the *Strategy for the development of cities* has the objective to provide a framework for environmental, economic and social management and, on the other hand, facilitate participatory development and the empowerment of stakeholders-local beneficiaries (*Municipalities and Populations*) in the following objectives:

- **Objective 1:** Strengthen the capacity of the elected officials and municipal officers in the management of their territory in accordance with the principles of good governance;
- **Objective 2:** Support the local authorities in the definition of a prospective vision and in the development of their programs of sustainability;
- **Objective 3:** Develop and implement the action plans and the programs of investment priority to stimulate economic, social and cultural cities of Mali and thus improve the quality of life of populations and reducing urban poverty.

4.6. Decentralization and Planning Policy

The purpose of the decentralization policy is to strengthen the process of democratization of the society, to adapt the tasks and the organization of the state to the requirement of local initiatives. It aims to establish a framework for development and spatial planning compatible with the skills, which are transferred to local authorities in the design, programming and implementation actions of development economic, social and cultural of regional and local interest. The operational framework for implementation of the decentralization is set by the outline of the scheme of planning (ESAT, 1995) and the drafts of regional program for management and development (AP-SRAD, 1997).

These tools are mainly intended to confer on economic development planning a territorial dimension within an organization of space taking into account the requirements arising from decentralization. The strategic directions identified in the policy are structured around four major axes: (i) rebalancing of the process of urban development through the promotion of secondary urban centres; (ii) the concentration of industrial activities in a limited number of urban centres, to promote a better pollution control; (iii) strengthening of the regional integration process by setting up liaison infrastructures and the interconnection of regional urban systems; and (iv) the preservation of the natural environment and threatened ecosystems.

4.7. The National Water Policy (NWP)

The current framework for water resources management is marked politically by the existence of a national water policy adopted in 2006 and with the overall objective to contribute to the socio-economic development of the country, by providing appropriate solutions to the water problems in respect of sustainable management of water resources. Its specific objectives are among others: (i) consider the water resources needs, quantity and quality of population growth, as well as ensuring respect for aquatic ecosystems and preserving the needs of future generations; (ii) contribute to the development activities agro - sylvo - pastoral by their security to the climatic hazards, (iii) the protection of people and goods against water related hazards and the protection of water resources against the pollution. The policy provides strategic directions that should serve as a frame of reference for a sustainable management of the water resources of the country, in respect of the balance of the

physical environment and aquatic ecosystems. One of the instruments for implementation of this policy is the national hydraulic planning program.

4.8. The National Sanitation Policy (NSP)

The national sanitation policy was developed in a participative way, and is designed to improve access of population to sustainably managed sanitation public service. It should make it possible to harmonize the approaches and interventions of the various actors involved in managing liquid, solid, special waste and storm water, bringing together public and private efforts and to increase the funding available for the sector. To achieve these goals, five strategic areas have been identified: They carry on the special, storm water, solid and liquid waste management and the transfer of skills. As a framework for all stakeholders involved in issues of sanitation, the national sanitation policy will contribute, through its implementation, to the reduction of poverty and infant mortality, the promotion of gender equality, the fight against diseases related to unsanitary conditions and the achievement of the objectives of the Millennium Development Goals (MDGs) by 2015 namely: a million people per year must have access to an improved rural and urban sanitation.

4.9. National Biodiversity and Conservation Strategy

Mali is endowed by a very diverse ecological landscape. Its natural heritage is marked by the existence of 1730 species of woody plants; about 640 species of birds; over 130 species of terrestrial wildlife; more than 140 species of fish (of which 24 endemic). The national strategy on biological diversity and its action plan are intended *inter alia* to: (i) have a directory of areas of interest to flora, fauna and the ecosystem-specific; (ii) improving knowledge on the functioning of ecosystems and animal and plant species economic or ecological interest; (iii) improve knowledge on the national genetic heritage of cultivated plants, related wild species, breeds of domestic animals and wildlife. (iv) promote the sustainable use of wildlife and flora; (v) ensure the preservation *in situ* of local crops and animal breeds threatened with extinction.

4.10. The National Forest Policy

The national forest policy is intended to contribute to achieving the objectives of economic growth, food self-sufficiency, increased income and environmental protection through the management of forest, wildlife and fishery resources. To do this, it revolves around three options specific to forestry, wildlife and fisheries resources: a social option aimed at empowering the rural for a sustainable management of resources recognizing the ability to rationally manage these resources with advice support they need; an economic option that aims to promote land investment by the co-financing of the state, if necessary, and providing guarantees of security of tenure; an ecological option that addresses conservation of genetic diversity, the diversity of production and biological diversity.

4.11. National Policy on Climate Change of Mali (NPCC)

The overall objective of the National Policy on Climate Change (NPCC) of Mali is to face the challenges of climate change through sustainable development. These specific objectives are: (i) facilitate better integration of climate challenges in the sector policies and strategies of national socio-economic development and direct interventions of public, private and civil society for sustainable development; (Ii) strengthen the adaptability and resilience of ecological systems, economic systems and social systems to the effects of climate change through the integration of adaptation measures in priority to the most vulnerable sectors; (Iii) build capacity for prevention and risk management and natural disasters; (Iv) contribute to the global effort to stabilize greenhouse gas emissions in the atmosphere, particularly by promoting clean and sustainable projects; (V) promote national research and technology transfer for climate change; and (vi) strengthening national capacities on climate change.

On the energy front, the strategic directions of the NPCC in the energy sector will revolve around: (i) the promotion of renewable energy; (ii) promoting energy efficiency; (iii) promotion of alternative energy sources Wood low cost energy (biogas, butane gas, fuel briquettes); (iv) the promotion of biofuels (production, processing and local use); (v) promotion of micro dams, and (vi) the mapping of biomass resources, wind and solar.

4.12. The National Health and Environment Policy

It aims to promote and maintain an environment conducive to health for sustainable development through (i) drinking water; by 2020 (ii) the management of solid and liquid wastes; (iii) the control of the quality of the water; (iv) the control of exposure to contaminants in the environment. It is part of the spirit of certain agreements and international conventions which: (a) the international decade for drinking water and sanitation; (b) the Convention on the rights of the child and water - Hygiene sanitation component; (c) the Stockholm Convention on persistent organic pollutants. In addition, there is the existence of technical services devolved in the field of water, hygiene and sanitation, and the existence of training modules.

4.13. The National Cartography and Geographic Information Policy

It includes in its objectives the improvement of the coverage of the territory mapping, aerial photographs and satellite images. To improve techniques for the collection of geographic information, Mali has set different priorities, namely basic cartographic information must be updated and standardized, while all the cartographic documentation will need to be scanned. A national geographic information committee, which includes all high-level directors and a regional Committee, have been created. The policy is implemented by the Geographical Institute of Mali (GIM).

4.14. National, Regional and Local Plans Related to Disaster Risk Reduction and Preparedness

The development of national plans, regional and local concerning the Prevention of Disasters and Relief Organization are provided by the draft texts under consideration. GDPC with its support project PRECARICA (1), has started and is currently pursuing the development process of these Plans. The National Action Plan will have an overview of coordination, monitoring / evaluation of the state of reducing disaster risk (RDR) of the country and define the integration strategy of the RDR in adaptation strategies to climate change and in developing programs and projects.

4.15. National Action Plan for Adaptation to the Adverse Effects of Climate Change (NAPA)

The National Action Plan for Adaptation to the adverse effects of Climate Change (NAPA) was finalized and approved in July 2007, under the leadership of the National Directorate of Meteorology (DNM) within the Ministry of Equipment and transport. Its development was carried out in a group of experts and highly participatory manner. The program identifies nineteen-priority adaptation options presented project ideas form.

5. LEGAL FRAMEWORK OF THE ENVIRONMENTAL AND SOCIAL MANAGEMENT

The project is questioned by several laws and regulations at national level, but also through agreements, treaties and conventions ratified by Mali.

5.1. Conventions, Treaties and International Agreements

The conventions, agreements and international treaties to which Mali has signed and which might be affected by the activities of this project proposal are given in the table below.

Table 5: Major international treaties signed by Mali

| N° | Designation of the Convention / Protocol / Agreement | Year of Adoption | Year of ratification |
|----|---|------------------|----------------------|
| 1 | <i>Rotterdam Convention on the Prior Informed Consent Procedure knowingly for certain Hazardous Chemicals and Pesticides in International Trade</i> | 1998 | 2002 |
| 2 | <i>The UN Convention on Biodiversity</i> | 1992 | 1995 |
| 3 | <i>The United Nations Framework Convention on Climate Change</i> | 1992 | 1994 |
| 4 | <i>The United Nations Convention to combat against desertification in countries experiencing serious drought and / or desertification, particularly in Africa</i> | 1994 | 1995 |
| 5 | <i>The African Convention on the conservation of nature and natural resources</i> | 1968 | 1974 |
| 6 | <i>The Bonn Convention on the Conservation of Migratory Species of Wild Animals</i> | 1979 | 1987 |
| 7 | <i>The Convention for the protection of the world cultural and natural</i> | 1972 | 1977 |
| 8 | <i>The RAMSAR Convention on wetlands of international importance</i> | 1971 | 1987 |
| 9 | <i>The International Convention on the trade of wild flora and fauna species threatened by extinction (CITES)</i> | 1973 | 1994 |
| 10 | <i>The Basel Convention on the control of transboundary movements of hazardous wastes and its disposal</i> | 1989 | 2000 |
| 11 | <i>The Vienna Convention for the Protection of the Ozone Layer</i> | 1994 | 1994 |
| 12 | <i>The Montreal protocol on substances that deplete the ozone layer</i> | 1987 | 1994 |
| 13 | <i>The of Stockholm Convention on persistent organic pollutants</i> | 2001 | 2003 |
| 14 | <i>The International Plant Protection Convention</i> | 1987 | 1987 |
| 15 | <i>Agreement on the Conservation of African-Eurasian migratory water birds' adoption</i> | 1995 | 1999 |
| 16 | <i>The "Hyogo Framework of Action 2005-2015 and CAH2: For the prevention and the implementation of the Disasters Risk Reduction"</i> | 2005 | 2005 |
| 17 | <i>Minamata Convention on Mercury: protect human health and the environment against emissions and anthropogenic releases of mercury and mercury components</i> | 2013 | Not Ratified |

Based on the analysis of the potential impacts of its activities, the RMD Project will take into account the requirements of safeguards and environmental protection contained in these international instruments.

5.2. National Legal Texts Applicable to the Project

The national legal framework on the environment is very rich and varied. Mali has legislated on almost all

environmental aspects: fauna, flora, living environment, environmental assessment, biosafety, water, pesticides, etc. Several laws and regulations are operational and have been considered relevant for the implementation of this project. There may be cited following:

5.2.1 The Constitution

It refers in its preamble to the commitment of the people of Mali to “ensure the improvement of the quality of life, protection of the environment and cultural heritage” and acknowledges to everyone "the right to a healthy environment”. It stipulates in article 15 "the protection, defense of the environment and the promotion of the quality of life are a duty for all and for the State.

5.2.2 National Legislation on the Environment and the Protection of Natural Resources

- Act No. 19-028 July 12, 2010, determining the principles of management of national forestry resources. It defines the conditions of conservation, protection, exploitation, transport, marketing, development and sustainable use of forest resources;
- Decree N ° 10-387/P-RM of 26 July 2010 establishing the list of protected forest trees and forest trees of economic value;
- Act No. 95-031/AN-RM of 20/03/1995 laying down the conditions of management of wildlife and its habitat, which lays down the General conditions of conservation, protection enhancement and exploitation of wildlife and its habitat in the national wildlife area;
- Decree No. 96-050/P-RM of 14/02/1996 on the procedures for classifying reserves and wildlife sanctuaries and areas of hunting interest.
- Act No. 02-006/AN-RM of 31/01/2006 concerning code water. The water code stipulates in its article 2 rules of use, conservation, protection and management of water resources.
- Decree No. 01-394 P - RM of September 06, 2001, which defines the purpose of the management of solid waste and concepts related to this form of pollution.
- Decree No. 01-397 P - RM of September 06, 2001, which defines the purpose of the management of pollutants of the atmosphere and concepts related to this form of pollution;
- Decree No. 01-396 P - RM of September 06, 2001, which defines the matter for noise management, concepts related to this form of nuisance;
- Act No. 92-013/AN-RM of 17 September 1991, establishing a national system of standardization and quality control which aims to ensure: the preservation of health and the protection of life; safeguard the security of men and goods; the improvement of the quality of goods and services; the protection of the environment;
- Decree No. 90-355/P-RM of 08 August 1990, laying down the list toxic wastes and the modalities for the application of the law N ° 89-61 / AN - RM;
- Act No. 01-020 dated May 30, 2001, relative to pollution and nuisances establishes the application of the polluter-pays principle which is designed to encourage developers to implement good environmental practices, and to carry out pollution abatement investments or to use cleaner technologies;
- The law N ° 08-033/AN-RM of 11 August 2008 relative to the installations classified for the protection of the environment;
- Decree No. 06-258/P-RM of 22 June laying down conditions for the implementation of the audit of the environment;
- The law N ° 85-40/AN-RM of 26 July 1985, relating to the protection and promotion of national cultural heritage.

5.2.3 Specific Land Management Legislation

- Act N ° 85-53/AN-RM of 21 June 1985, establishing administrative easements planning;
- Act N ° 93-008/AN-RM of 11 February 1993 laying down the conditions of the administrative freedom of local authorities, as amended by Act No. 96 056 of 16 October 1996 and amended by Act No. 99037 August 10, 1999;
- Act N ° 95-034/AN-RM of 12 April 1995 code of territorial communities, amended by Act No. 98 010 of 19 June 1998 and amended by Act No. 98 066 of 30 December 1998;
- Act No. 96/050 16 October 1996 on principle of constitution and management of the domain of local authorities;
- Act No. 96-059 04 November 1996 establishing communes;
- Act No. 035, 10 August 1999 establishing the territorial communities of circles and regions;
- laws No. 95-034 April 12, 1995, 98-010 of 15 June 1998 and 98-066 30 December 1998 code of territorial communities;
- Act No. 96-050 16 October 1996 on principles of constitution and management of the domain of local authorities;
- Law N ° 06-40/AN-RM on law of agricultural Orientation;
- Order No. 00-027/P-RM of 22 March 2000 Land Title Code, amended and ratified by Act No. 02-008 dated February 12, 2002;
- Decree N ° 01-040/P-RM of February 02, 2001 determining the forms and conditions of allocation of the land of the private estate of the State;
- Decree N ° 01-041/P-RM of 02 February 2001 laying down the procedures for the award of the permit to occupy;
- Decree No. 02-111/P-RM of the 06 Mars²2002 determining the forms and conditions of management of the real estate public areas of the State and local authorities;
- Decree No. 02-112/P-RM of 06 March 2002 determining the forms and terms of powers of the grounds of the private estate of local authorities.

5.2.4 Legislation Specific to the Study of Environmental Impacts

Conducting environmental assessment is regulated by the provisions of Decree N ° 08-346 P-RM of 26 June 2008 concerning environmental and social impact assessments, amended by Decree N ° 09-318/P-RM of June 26, 2009 laid out by the rules and procedures relating to Environmental and Social Impact Studies. This Decree on ESIA brings significant progress and an important legislative instrument for environmental protection applicable to the various sectors of activities affecting the environment: natural resources and urban environment, industrial and craft activities, mining and agricultural activities, electric transport, etc.

The decree emphasizes the obligation to carry out an environmental impact study and the respect of the procedure for all Projects, whether they are public or private which are likely to impair the biophysical environments and human. In addition, the provisions of the legislation on environmental and social impact studies are based on the following principles:

- The environmental assessment is an integral part of programs and Projects and the results of the impact study are presented in the file for approval of the administrative permission;
- The proponent is responsible for the completion of the study, of the constitution of the EIA documentation and provides costs;
- The proponent also ensures the realization of measures of correction, reduction and/or compensation of the negative impacts of the Project as well as the internal monitoring according to the required standards.

The Decree specifies the important elements concerning the scope of impact studies, the requirement of the procedure for some Project types, the content of the reports, the obligation of the public consultation, the development of the Environmental and Social Management Plan (ESMP), including the costs of mitigation, the role of stakeholders and implementation timelines. For all Projects subject to EISA, the performance of the work is subject to obtaining an environmental permit issued by the Minister of the environment.

The decree classifies the development Projects in three (3) categories:

- Projects in category A: Projects that can have very negative, usually irreversible impacts, unprecedented, most often felt in an area broader than the sites subject of work;

- Category B Projects: Projects including negative impacts on the environment and populations are less serious than those of Category A Projects. These impacts are of a bounded and rarely irreversible nature.
- Category C Projects: Projects including negative impacts are not significant on the environment.

Projects in categories A and B are subject to the study Environmental and Social Impact Assessment (ESIA). Category C Projects are subject to a simplified impact assessment sanctioned a record of environmental and social impact. Policies, strategies and programs subject to strategic environmental assessment.

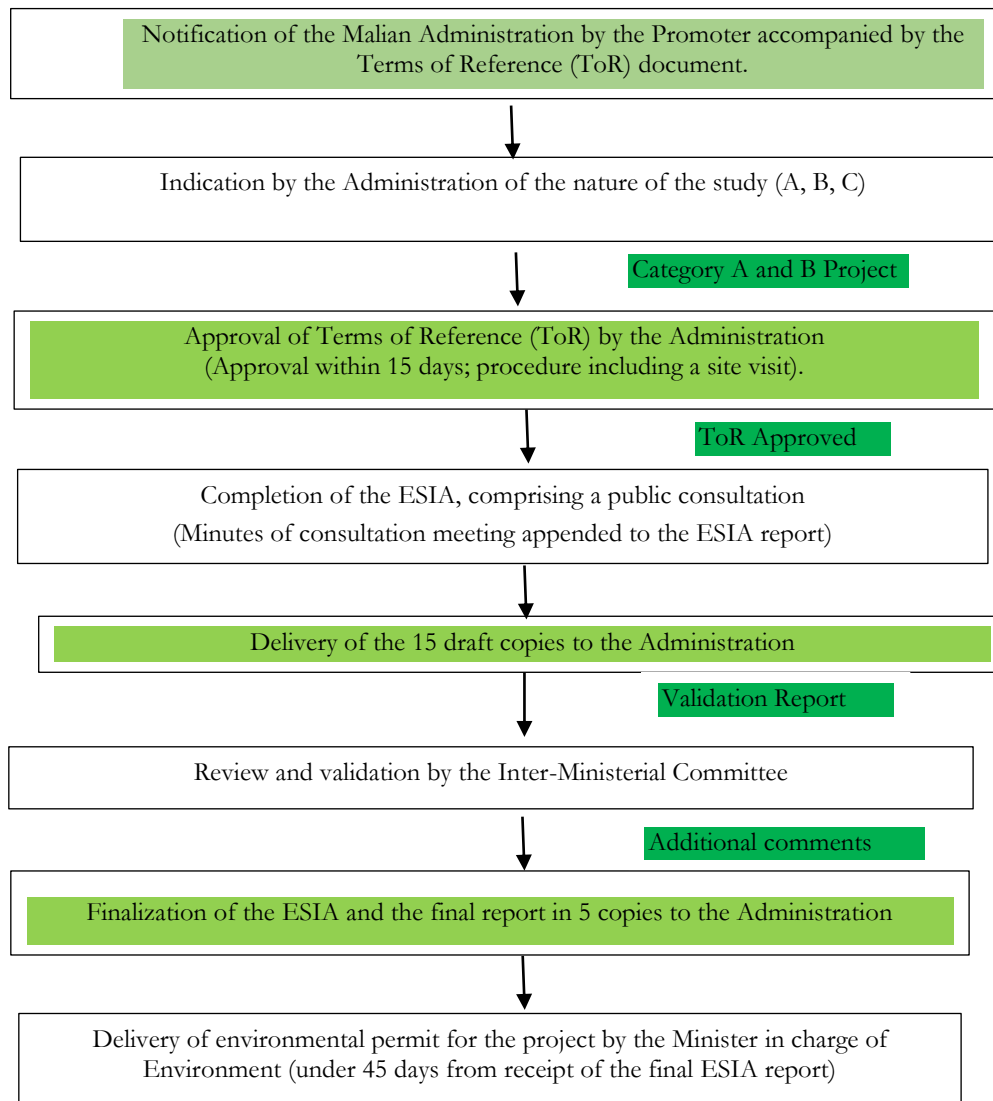


Figure 5: Realization Procedure of ESIA in Mali - Category A or B projects

6. INSTITUTIONAL FRAMEWORK FOR PROJECT ENVIRONMENTAL MANAGEMENT

The environmental and social impact assessment makes reference to the following institutions:

6.1. Ministry of the Environment, Sanitation and Sustainable Development

The Ministry of the Environment, Sanitation and Sustainable Development (MESSD) is responsible for the implementation of the environmental policy of the country. Its mission covers the following areas: ensuring the creation of a basic environmental infrastructure as supports to domestic and foreign investment; monitoring and promoting ongoing programs in the fight against desertification, the remediation of the living environment, and control of activities classified to risks to the environment; protecting the ecosystem of rivers and their basins; maintaining and developing the parks, forests and nature reserves.

The following services of the MESSD are implicated by the implementation of the Project:

- ***The Agency of Environment and Sustainable Development (AESD)***: it was created by act No. 10-027/P-RM of 12 July 2010. It arises from the will of the Government to review the institutional framework of environmental management put in place since 1998. Its mission is to ensure the coordination of the implementation of the national policy of protection of the environment (PNPE); the capacity of the different actors involved in the management of environmental issues through training, information, education and communication; to mobilize the necessary funds for the implementation of programs and Projects through existing mechanisms. The creation of this agency will ensure better monitoring of the implementation of the agreements, treaties and conventions on the environment and establish the necessary synergy in the interventions of the different actors.
- ***The National Directorate of Sanitation Pollution and Nuisances Control (NDSPNC)***: it follows and ensures taking account of environmental by sectoral policies plans and development programs; oversees and controls the ESIA procedures; develops and ensures compliance with standards for sanitation, pollution and nuisances; control the compliance with the requirements of legislation and standards and supports local sanitation authorities fight against pollution and nuisance. The NDSPNC offers decentralized services at the regional level, circle, and common, supporting local authorities for their level of operation. In the implementation of the SREP, the NDSPNC and its decentralized services (NDSPNC) must ensure the application of the ESIA procedure, validation of ESIA reports and participate in the supervision and monitoring of the implementation.
- ***The National Directorate of Water Resources and Forests (NDWRF)***: the primary mission of the NDWRF is to develop the national policy for the conservation of nature and to ensure execution. As such, it is responsible: to develop and implement plans of development and restoration of forests, parks and reserves, as well as programs of action to combat desertification; to participate in the negotiation of agreements and international treaties to the conservation of forests and wildlife and to ensure their implementation; to ensure the collection, processing and dissemination of statistical data and to train local authorities in the Management of Natural Resources (MNR), for the transfer of skills and financial resources on Natural Resources Management (NRM) to communities, in accordance with the operational decentralization.

6.2. The Ministry in Charge of Domain and Population Resettlement Policy

The impacts of relocation caused by development projects, if not mitigated, often result in economic, social and severe environmental risks. These risks result from the dismantling of systems of production or loss of income sources for people adversely affected by the project activities. Note that involuntary relocation procedure is triggered only when the people are affected by actual physical movement. It is also when the activity taken in the project will simply results in land acquisition.

The domain and land system is essentially based on the Ordinance No. 00-27 of 22 March 2000 National Land Code amended and the provisions of Law No 96-050 of 16 October 1996 on the principles of the constitution and management in the domain of local governments. The public domain of the State consists of natural and artificial public domain. Decree No. 01-040 / P-RM of 2nd February 2001 determined the forms and conditions of allocation of land in the real estate private domain of the State. The law confirms the collective or individual customary rights over unregistered land. The different properties may be subject to compliance with the principle of public utility.

Mali' framework of relocation provides an evaluation and compensation commission. But, increasingly, in the framework of certain projects, ad hoc committees are also put in place to deal with the issue of compensation. It is for this reason, that an evaluation and compensation Committee should be established for this purpose. The procedures for expropriation and compensation also exist in the federal code. Thus, no one may be expropriated except for public purposes and for just compensation in advance.

The expropriation procedure is quite long. The public utility of a project must be specifically declared in the act of authorizing the work. Otherwise, a supplementary declaration may be made by decree or order. After the declaration of public interest, the Minister of Land tenure usually makes an order stating that transferability within the period of one year from the order, no construction can be carried out, any planting or improvement cannot be done on land located in an area specified in the act, without authorization of the Minister. However, the order must be made not later than one year after the declaration of public utility, if not it will be considered that the administration has abandoned the expropriation. Moreover, the order of transferability cannot be taken without "the stalk and incommode survey". This is used to determine the advantages and disadvantages of the project to the public. In this context, the project is deposited with a plan showing the land titles. The people affected by this project will be processed under this procedure. The Malian Ministry of Housing, Land Affairs and Urban Planning in 2011 has improved the institutional framework with the help of the World Bank in the urban infrastructure development project (UIDP).

The institutions concerned are:

- The Ministry of Housing, Land Affairs and Urban Development (MHLAUD);
- The Ministry of Territorial Administration and Local Government (MTALG);
- The Ministry of Rural Development;
- The Ministry of Environment, Sanitation and Sustainable Development

Other institutions involved in the resettlement procedure of populations:

- **The Regional Land Commissions:** they are presided over by the administrative authority, and include local elected officials and the decentralized technical services. Their responsibilities are; to observe the effectiveness of the land development; to try to reconcile the parties or give its opinion on the amount of compensation in case of eminent domain, as well as the building purchase price, which are the subject of a pre-emption and any issue affecting the land orientation of the local community.
- **The National Commissions** play an important role in resettlement to the extent that they can hear anyone who might give them information about the land situation of the building concerned. The Ministry of Urban Development officials may for this purpose assist them. Each Local Authority also has a state-owned commission. It is in this context that National Commissions exist in different urban and rural municipalities. They are responsible for implementing the land policy of the local authority and rule on disputes that exist within their localities in the land sector. Their technical reviews permit local officials to decide if a problem is related to this field.

Furthermore, the compensation procedure in agricultural losses, provides the setting up of a commission composed of State services representatives (land service, the Agriculture Service, Department Forestry and Water), the Local Authority concerned and of the support structure for the establishment of facilities. Previously, a letter of gratitude is addressed to the manager of state land affairs service. National and regional services of Agriculture are responsible for the assessment to be made for the compensation of victims whose assets are affected. They must determine the amount payable in the case of an orchard, a vegetable perimeter or a

farm. The results of the evaluation of the parcel are to be presented to all the members in the general meeting when it is an OCB / OSP (Cooperative Association, etc.).

The weaknesses of the institutional framework can be summarized as follows:

- Lack of information about the resettlement process;
- Lack of consultation with stakeholders;
- Poor definition of the eligibility criteria of displaced persons

6.3. Other Institutions involved in Environmental and Social Management of the Project

The General Directorate for Civil Protection (GDCP): the GDCP is the main institution of risk management and disaster at the national level (Law n°004, January 6, 2006). As coordinator of the RRD/GRD in Mali, the GDCP is responsible: to organize and coordinate Prevention and Assistance; elaborate disaster management plans and implementing them; manage the logistical resources allocated to the performance of its tasks; to coordinate and control the actions of rescue services; to run the National Civil Protection policy (NCP). GDCP coordinates the implementation of the Assistance Plan. GDCP is also responsible for carrying out rehabilitation actions after the disasters, calamities and disasters, promote actions to help secure populations; to participate in peacekeeping operations and humanitarian missions.

The environmental and social management of Project requests other categories of stakeholders, namely:

- The Mali Meteo Agency (MMA)
- The National Directorate of Water Resources (NDWR)
- The National Centre for the Fight against the Desert Locust (NCFDL)
- Civil society organizations.

Sectorial institutions are mandated to manage the risks according to their nature. The focal points for the management of specific risks include the National Centre for the Fight against the Desert Locust (NCFDL), the Sahel Institute, and GDCP is the focal point for the flood. Specialized structures deal with issues of food security in particular the Office of food security (OFS). The National Centre for the Fight against the Desert Locust (NCFDL) evaluates and continuously tracks the risk of locust invasion.

A draft of legislation, ongoing review prior to its submission to the National Assembly, stipulates the implementation of a permanent National Commission for prevention, fight against disasters and organization relief.

6.4. Territorial Collectivities

At the local level, the local authorities play an important role for local development, with the risk and disaster management skills (law n° 95-034/AN-RM of 12 April 1995 on local and regional authorities code, amended by Act No. 98 010 of the 19 June 1998 and amended by Act No. 98 066 of 30 December 1998), but also sanitation, health, urban roads and environmental and social management. With the support of the services of the State, the local authorities may take any measure to preserve public health and improve the quality of life in housing, management of communication and information, maintenance of drainage pipes, etc.

6.5. Analysis of the environmental and social management capabilities in the project

Environmental and social capacities of sub regional institutions services

The CILSS, SSO, the NBA and ACMAD are specialized institutions that have experts in environmental and social sciences.

Environmental and social capacities of MESSD services

The NDSPNC is the national institution in charge of the ESIA (validation and follow-up of the implementation of the ESMP). To ensure the supervision, a general guide to studies and environmental impact instructions has

been developed. The NDSPNC offers regional structures (RDSPNC) which reinforces its effective operational capability in terms of proximity in the conduct and especially monitoring of the implementation of the ESIA. The Project must provide institutional support to the NDSPNC for the assessment, approval and monitoring of the activities to be undertaken.

Environmental and social capacities of implementation structures and recipient agencies

The GDCP provides the technical execution of the project and shall ensure the taking into account of the environmental and social aspects in the planning and implementation of micro-projects. However, the recipient agencies (MWA; FSC; NDH) do not have expert environmentalists, but generally thematic experts (hydrology, meteorology; etc.) but not in environmental and social. In addition, as part of the Project, these structures must be strengthened in managing environmental and social projects.

7. SAFEGUARD POLICIES OF THE WORLD BANK

The World Bank's environmental and social safeguard policies include both, Operational Policies (OPs) and Bank Procedures (PB). Backup policies are designed to protect the environment and society against the potential negative effects of projects, plans, programs and policies. The policies of the most common environmental and social safeguards are: OP/BP 4.01 environmental assessment, including the Participation of the Public; OP/BP 4.04 Natural Habitats; OP/BP 4.09 Pest; OP/BP 4.11 Physical Cultural Resources OP/BP 4.12 involuntary Resettlement; OP/BP 4.10 Indigenous People; OP/BP 4.36 Forests; OP/BP 4.37 Dams Safety; OP/BP 7.50 Projects in International Waterways; OP/BP 7.60 Projects in Disputed Areas.

The environmental and social safeguard policies of the World Bank that may apply to sub-projects that will be conducted as part of the implementation of the program are: **OP 4.01** "Environmental Assessment"; **OP 4.12** "Involuntary Resettlement of people." The program should consider activities that trigger the indicated above policies and compliance measures are proposed in this ESMF. The remaining operational policies are not triggered by the Project.

7.1. OP/BP 4.01: Environmental Assessment

OP/BP 4.01 aims to ensure that Projects financed by the World Bank are viable and environmentally feasible and that the decision-making is improved through appropriate analysis on their probable environmental impacts (OP/BP 4.01). This policy is triggered, if a project has likely potential environmental impacts (negative) in its area of influence. OP/BP 4.01 covers impacts on the physical environment (air, water and land); the quality of life, health and security of the populations; physical cultural resources; and cross-border and global environmental concerns. The project triggers this policy because certain activities may be subject to an environmental impact study.

7.2. OP 4.12: Involuntary Resettlement Population

The objective of OP 4.12 is to avoid or minimize involuntary resettlement where feasible, exploring all other alternatives ways of viable projects. In addition, OP 4.12 intends to provide assistance to displaced people by improving their former living standards, the ability to generate revenue, production levels, or at least to restore them. The project includes activities that could lead to a relocation (loss of property and assets) may cause population displacement or loss of land.

8. POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS

The most significant environmental and social impacts will occur with the implementation of sub-component B: modernization of observation infrastructure, forecasting, warning and response. It will finance equipment and infrastructure to improve:

- data collection networks;
- physical and software infrastructures for data analysis and decision support;
- the response means to improve civil protection, food security and nutrition

8.1. Positive environmental and social impacts of the project

The positive impacts of this project in development stage focus on the human component of the environment. The planned investments taking into account purchases of construction materials and equipment to install and development operations of the site, construction of buildings and equipment installation. Thus, the project start is still a business opportunity for construction companies, technical monitoring, import-export. Furthermore, site development work requires staff, thus reducing unemployment.

8.2. Negative environmental and social impacts

The project activities, which could have negative environmental and social impacts are the construction of hydro-metrological stations and construction or rehabilitation of infrastructure (Table 6).

Table 6: Actions with negative environmental and social impacts

| Institutions | Actions that have negative environmental and social impacts | Potential impact |
|--|---|---|
| National Agency of Meteorology (MMA) | Civil engineering operations Installation, monitoring and maintenance of hydro-meteorological stations | Reduction of vegetation cover Risks of accidents and pollution Risk of mercury pollution Risk of conflict for land |
| General Directorate of Civil Protection (GDPC) | Civil engineering operations | Risks of accidents and pollution |
| Food Security Commission (FSC) | Civil engineering operations | Risks of accidents and pollution |
| National Directorate of Hydraulics (NDH) | Installation, monitoring and maintenance of hydro-meteorological stations | Mercury pollution risk Human health affected Disruption of the natural environment |

Negative impacts on air quality: during the construction phase, site facilities and construction / rehabilitation of buildings locally increase the dust in the air during strong winds and during labor, with gear changes and direction. The demolition work will also cause the release of dust. These harmful dust can easily be inhaled and cause damage to lung tissue.

- **Negative impacts on soil:** In construction phase, the risk of alteration of the texture of the surrounding soil of the site will be relatively low with the presence of works vehicles and storage of materials. However, the use of mechanical devices (or exceptionally explosives) could cause moderate adverse impacts on the structure of soils. Can just worry about risks of degradation and contamination by residues of construction, but that will be very limited and could be easily avoided. During the operation of the building, there will be no significant impact on the soil.

- **Negative impacts on water:** In the working phase, there are risks alteration courses waters and their surroundings, particularly the disruption of spawning areas and other ecologically sensitive areas in the implementation of the hydro- meteorological stations and these risks also exist in operating phase, surveys of the measures.
- **Negative impacts on flora and fauna:** The work relates mostly to existing sites. However, it is possible that trees be removed on some sites. In the operating phase, there will be no significant negative effects.
- **Negative impacts on local residents:** During the work, lawless discharges of solid and liquid of construction waste (residues, cuttings, etc.) could degrade the immediate environment, as the points of discharge could be transformed into wild dumps of garbage, especially residues of demolitions and cuttings will be very important. Rotations of the vehicles carrying the equipment and construction materials may also interfere with the movement and mobility in general, as well as nuisances (noise, dust) to which residents will be exposed. There is even the risk of traffic accident. The work will not cause inconvenience in the provision of water, electricity and phone in riparian areas to the work. The risk of disruption of the socio-economic activities is very low.
- **Risks related to construction accidents:** During the construction phase, there are risks of accidents related to construction equipment and construction material poorly protected or used inappropriately. The risk of falling of plain - foot exists for all authorized and unauthorized on the site in terms of narrow and congested traffic areas. The risk of accidents also related to road traffic for the delivery of building materials is to be feared (movement of gear: collision, skid, striking, pinching, crushing, or load - fall, striking reversal during operations).

8.3. Risks related to installation and maintenance of hydro-meteorological stations

- The mercury is in different devices chosen to help protect the environment and the population by hydrometeorology. Compared to international instruments, hydro-meteorological services are not clearly mentioned in international regulations. Mercury is a chemical element present everywhere in nature (water, air, soil). It is used in many fields due to its outstanding physicochemical properties. However, its accumulation in nature has serious consequences on the environment. According to the WHO, mercury is one of the ten chemicals of high concern for public health. Inhaled or ingested, it is still very harmful to human health. The negative impacts of mercury on human health are also the cause of a considerable decrease in human resources available for affecting the brain; it has the ability to reduce the intelligence quotient of intoxicated persons.
- The mercury has many negative impacts on the environment because of its high level of toxicity. In the air, it can be driven into the ground by rainwater and pollute plants, wildlife, soil, ground water and suddenly the water available for the population as well as for fish and wildlife. In water, it is able to adsorb suspended solids and sediment and inhibit the metabolism of microorganisms, thus blocking their function in the wastewater treatment. By reducing the potential for water self-purification, it disrupts the aquatic ecosystem with consequences for the change in the nature of aquatic fauna. This level of spread with a heavy metal such as mercury that has the ability to accumulate in living tissue and gradually increase in the food chain is a global alert (Minamata Convention in 2013, signed by Mali).
- The World Health Organization (WHO) publishes data on the health effects of different forms of mercury, tips for identifying populations at risk of exposure to mercury. It also provides tools to reduce exposure to this element, as well as tips for replacing helpful thermometers and blood pressure for healthcare. It conducts projects to promote rational management and disposal of health care waste and has facilitated the development of a device without mercury, validated and affordable to measure blood pressure.

8.4. Other negative impacts

Significant adverse social impacts will concern mainly the acquisition of land for the establishment of new monitoring stations of the national agency of meteorology. Other consequential potential negative social impacts in construction of hydro-meteorological stations include: disruption of the living, the generation of solid waste; the occupation of private lands by machinery and equipment construction sites, the probable destruction of crops, the risk of accidents at work, etc. Other negative impacts can be reported.

- Inconvenience and nuisance caused by bad choice of location observation stations***
The non-compliance to the choice of location of the observation stations can have negative consequences in terms of risk (tidelands or hazardous slips, etc.), which will increase the risk of accidents. Nuisance due to the movement of vehicles and construction machinery: On the human environment, the vehicles carrying the equipment will risk impede movement and mobility in general, in addition to (noise, dust) which populations will be exposed. It is the same risk of traffic accident.
- Risk of spread of STDs / HIV / AIDS***
We must also point out the risk of spread of STD / HIV / AIDS with the building construction sites of staff, when we know that some staff working in construction sites will reside temporarily in these places, which can promote contact with women or men of the said localities.
- Risk of social frustration when not using the local labor force***
The non-use of the resident labor during work may cause frustration (and even conflict at the local level). Local recruitment of unskilled labor should be encouraged, which would not only provide jobs for some unemployed young people, but especially local ownership of the project. The frustration born of non-use of 'local' may result in vandalism during and after construction. However, recruitment can be a security pattern, warranty and maintenance and infrastructure protection. Vandalism acts may involve sabotage, looting or damage to infrastructure.
- Risks of social conflicts in case of public or private land occupation***
The unauthorized storage of materials and / or works vehicles on private land could generate conflicts with owners, especially in cases of pollution / degradation.

8.5. Synthesis of negative environmental and social impacts

The following table 7 presents the synthesis of potential negative environmental and social impacts of the Project.

Table 7. Synthesis of potential negative environmental and social impacts

| Activities | Negative Impacts | Impact Sources |
|---|---|--|
| Civil engineering operations | Reduction of vegetation cover Risks of accidents Risks of pollution of soil, water and air Risk of mercury pollution Risk of conflict for land Disruption of the Natural environment Loss of land for agriculture Risk of potential erosion of embankments Waste accumulation | Embankment Building site wastes Involuntary population displacement Bad use of PIE Recruitment and installation of workers Change in habits |
| Installation, monitoring and maintenance of hydro-meteorological stations | Risk of water pollution (rivers and sea) Human health affected Pollution of fauna and flora Loss of biodiversity Reduction of natural purification capacity of aquatic ecosystems | Low equipment operating Unintentional spills of mercury |

9. MITIGATION MEASURES OF NEGATIVE IMPACTS

The Project is Class B according to the criteria of the World Bank, the negative impacts are localized. Thus, some activities are subject to an Environmental and Social Management Plan (ESMP) before starting or an Action for Resettlement Plan (RAP) in the event of involuntary displacement (relocation of people, loss property, etc.). These environmental and social studies will determine more precisely the nature of the measures to be applied in each sub-component. In case of no need for such studies, simple environmental and social measures, to achieve both during the construction phase and in operation period, may be applied following the steps below.

The main recommendation in this context relates to the strict application of international standards, including guidelines on environmental, health and safety of the World Bank, the European Union and the World Health Organization guidelines for health relationship with Malian environmental texts.

Table 8 below summarizes the mitigation measures for previously identified impacts. Guidelines and environmental and social clauses to be included in the bidding documents and works are proposed. Given the danger of potential impacts of mercury, an additional analysis was reserved for specific measures to be adopted for mitigating such impacts.

Table 8 Synoptic distribution of mitigation measures

| Impacts | | Mitigation measures |
|--------------------------------------|--|--|
| Soil | Risk of potential erosion of embankments | Reuse or disposal of embankments in the shortest possible time |
| | | Lead the work generating sediment accumulation in the dry period |
| | | Establish temporary mechanical structures for soil conservation |
| | Potential soil erosion during construction | Reuse or disposal of material deposits in the shortest time |
| | Disruption of the surface layer of topsoil or (deposition materials etc.) | Collect waste containing mercury with suitable containers and dispose of in landfill sites. |
| Construction waste | | |
| Vegetation | Landscape modification | Avoid, among others, as much as possible earthworks, excavation and tree cutting |
| | Potential for absorption in the mercury content plants escaped into the atmosphere by the aerial parts | Collect appropriate solid waste and eliminate them in engineered landfills. |
| | Loss of biodiversity | Avoid sites with endemic species |
| | | Avoid the disposal of animals and habitats out of the grip of the work |
| | Restore or rehabilitate sites | |
| Aquatic fauna | Fish contamination risk by food (plankton), or by breathing through the body surface | Collect the solid / liquid waste with suitable containers and dispose in places determined by the Government. |
| Surface water and groundwater | Risk of water pollution (rivers and sea) from solid waste and unintentional spills of chemical waste | Train staff in the handling, storage and containment of chemical waste and hazardous materials |
| | | Use of machinery and equipment in good condition. |
| | | Collection, reuse / disposal of solid wastes by the standards of environmental safeguards sediment and waste sites |
| | | Collection, reuse or disposal by the standards of environmental safeguards sediment and waste sites |

| | | |
|--------------------|--|---|
| | Risk of deterioration of the water quality of the river due to the transport of sediment and construction waste | Collection, reuse or disposal by the standards of environmental safeguards toxic waste |
| | Risk of contamination and / or disturbance of aquatic ecosystems from runoff of toxic wastes (residual cement, scrap metal, oils and fluids equipment, paints, etc.) | Building / use of temporary latrines by the standards of environmental safeguards or use of mobile latrines for workers |
| | Water supplies contaminated by feces risks for workers | |
| Air | Building / use of temporary latrines by the standards of environmental safeguards or use of mobile latrines for workers | site watering, wearing of protective equipment for speed and control workers and frequency of vehicle traffic |
| | Building / use of temporary latrines by the standards of environmental safeguards or use of mobile latrines for workers | Collect waste containing mercury with suitable containers and dispose of in storage places decided by the Government |
| Fauna | Contamination of fish-eating birds | Collect waste containing mercury with suitable containers and dispose of in landfill sites. |
| Populations | Influx of workers, laborers and other unknown in the area looking for opportunities related to the project resulting in cases of criminality and violence. | Search the participation of local elected officials, heads of Base Organizations and other local leaders in the recruitment process |
| | Population exposure risks to mercury pollution. | Collect waste containing mercury with suitable containers and dispose in storage places decided by the Government |
| Workers | Risk of accidents during construction | Port of protective equipment |
| | Risks related to the implementation of equipment | Port of protective equipment |
| | Risks related to respiratory problems due to dust | site watering, wearing of protective equipment for the workers |

10. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

This Environmental and Social Management Plan Framework (ESMPF) includes the following components:

- the methodology for the preparation, approval, and implementation of subprojects (environmental selection process or screening) to enable the identification of potential environmental and social impacts that may arise from project activities and implementation of the proposed mitigation measures;
- capacity building;
- monitoring and implementation of mitigation measures;
- cost estimates related to timeline.

The ESMPF must be included in the Project Operations Manual.

10.1 Methodology for the preparation, approval, and implementation of subprojects

10.1.1. The process of environmental and social screening of project activities

The results of the selection process will determine the environmental and social measures necessary for the activities of the Project. The various activities of the Project, including those relating to the construction of buildings and infrastructure, could be an environmental and social screening process. The selection process will:

- identify project activities that may have negative impacts at environmental and social level;
- identify appropriate mitigation measures for activities with adverse impacts;
- identify activities that require the development of the Environmental and Social Management Plans (ESMP);
- describe the institutional responsibilities for (i) the analysis and approval of the results of the selection, the implementation of proposed mitigation measures, and the preparation of ESIA reports; (ii) monitoring of environmental indicators in the realization of activities and their implementation;
- indicate program activities likely to cause population displacement and land acquisition.

The environmental and social screening process includes the following steps:

Step 1: preparation of sub-project (technical files of the execution of the infrastructures)

The preparation of technical files of sub-projects to realize will be done by Mali-Weather Agency, National Directorate hydraulic (NDH), the Early Warning Service (EWS) and the General Directorate of Civil Protection (GDCP) to the operations of the component B "Modernization of observation infrastructure, forecasting, warning and response." It is at this preparatory stage that the environmental and social aspects must begin to be addressed, especially with the filling of the environmental and social screening forms.

Step 2: Filling of the selection form and environmental and social classification

Once the implementing technical documents have been realized according to the components, the Environmental Units of the four institutions (according to the component to be financed), will conduct the environmental and social screening targeted activities to see whether or not an environmental work is required. For this, each unit will (i) fill the environmental selection form (see Annex 1) and the environmental and social checklist (Annex 2); (ii) analyze the planned activities and (iii) follow with the classification of the concerned activity.

The classification and approval of projects will be as follows:

- If no backup policy is triggered, the process of preparation and implementation is ongoing;
- If the project triggers a backup of the World Bank policy, they will ensure that agreed procedures are followed, such that an Environmental and Social Management Plan (ESMP) is prepared, and a Resettlement Action Plan (RAP) in connection with the Minister of Environment, Sanitation and Sustainable Development (MESSD). These units can rely on consultants in environmental and social assessment, including the preparation of TOR to recruit the consultant(s) to better facilitate the review and approval of the ESMP to achieve.

Evaluation rubrics help to minimize the outset negative impacts of the project and specially to minimize resettlement and loss of land and access to resources. Even if national environmental legislation does not have an environmental classification of projects in accordance with the requirements of the World Bank (notably OP 4.01), the ESMF will fill this gap. Thus, the Project activities that may have negative impacts on the environment are classified into three categories:

- Category A: Project with some major environmental and social risk;
- Category B: Project with moderate environmental and social risk;
- Category C: Project without significant impacts on the environment.

In this respect, the results of the selection will be the environmental category B or C. No technical file of the Project would be started once all the environmental and social due diligence is actually taken into account and incorporated in the files.

This stage will be conducted parallel with the technical file preparation phase to incorporate in the design of the identified environmental and social concerns.

The Project Management Unit (PMU) will recruit an expert in environmental and social assessment (ESA Expert) who will support the Environmental Units of the four institutions (Mali -Weather, NDH, EAS, GDPC) to consolidate and strengthen the “environmental and social function” of the project.

Step 3: Execution of environmental and social work

After analyzing the information contained in the results of the selection and after determining good environmental category, and the magnitude of the environmental work required, the Environmental Units will make a recommendation whether: (a) environmental work will not be necessary; (B) the application of simple mitigation and safety measures will suffice; or (c) a specific Environmental and Social Management Plan (ESMP) will be prepared.

Step 4: Review and approval of the ESIA reports

The eventual Environmental and Social Impact Assessment reports are reviewed and validated at the national level by the Services of the Ministry of Environment, Sanitation and Sustainable Development (MESSD). The ESIA report will be submitted to the World Bank for non-objection.

Step 5: Public consultations and dissemination

National legislation in relation with EIA makes available the information and public participation should be ensured during the implementation of the environmental impact assessment, in collaboration with the competent organs of the administrative district and local authority concerned. Public consultations already initiated during this development phase of ESMF and RPF will equally be held during the preparation of the ESMP and RAP, so that the feedback from these consultations can be incorporated in these documents.

The consultation results will be incorporated in these reports and will be available to the public and in accordance with the requirements of consultation and dissemination of the World Bank.

Step 6: Integration of the environmental and social provisions in the tender dossier

In case of environmental work, the project SEA Expert will integrate the recommendations and other environmental and social management measures in the bidding dossiers and implementation by the company.

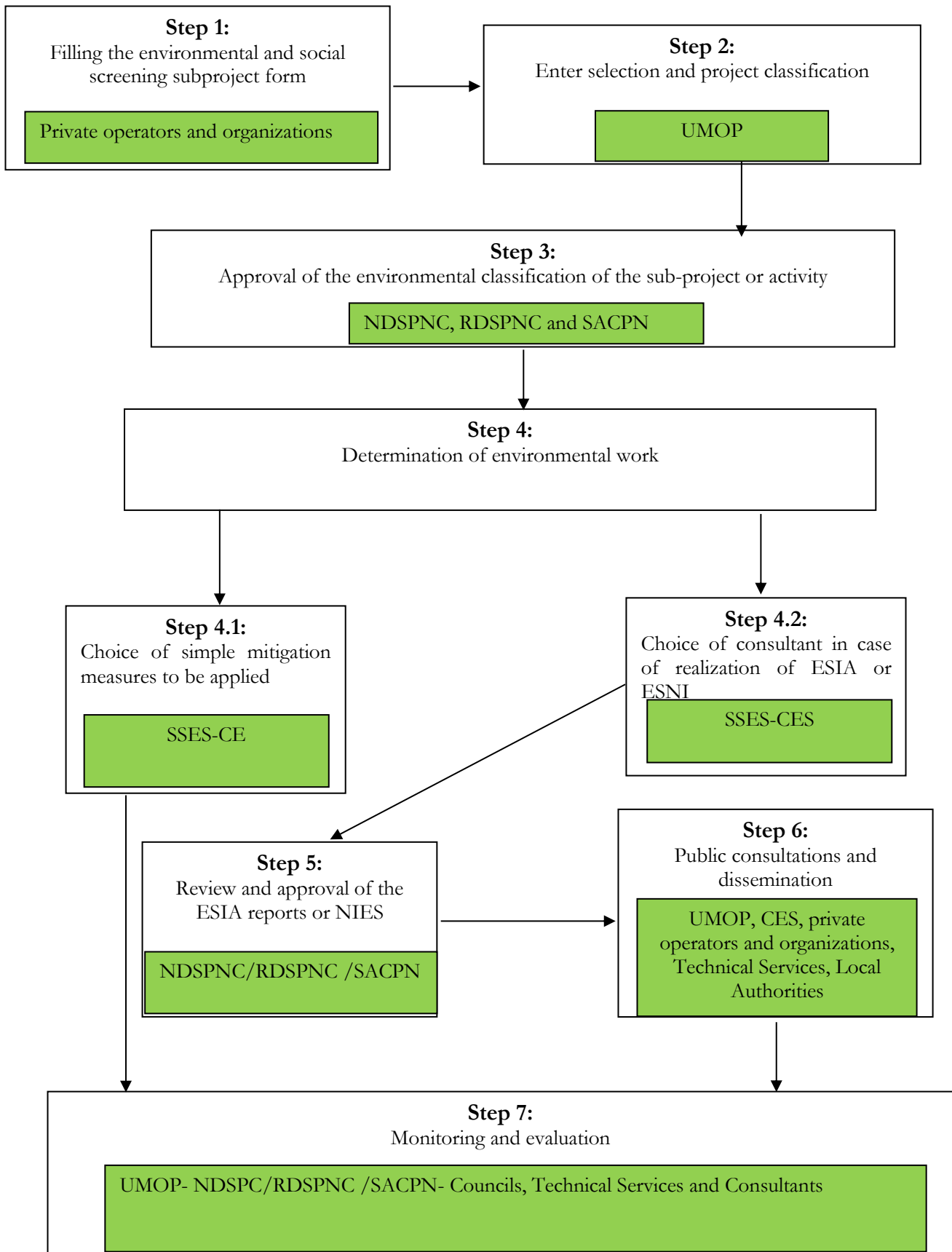
Step 7: Environmental and Social Monitoring

The classification of forms validated as well as ESMP will be transmitted, for information, Mali- Weather, NDH, EWS or GDPC, according to the components to run, to coordinate monitoring by relevant experts.

- Environmental and social monitoring will be done by the ESA Expert of the project.
- Internal monitoring of the implementation of the components will be provided by the Ministry of Public Works and Transport.
- External monitoring will be conducted by the Ministry of Environment, Sanitation and Sustainable Development, the Local Authorities, etc.

- The evaluation will be carried out by the consultants (national and / or international), at the end of the project. The final evaluation will be done once for all executed sub-projects.

10.1.2. Responsibilities for the implementation of the environmental and social screening



10.2. Responsibilities for the implementation of the environmental and social screening

Table 9 below provides a summary of the steps and institutional responsibilities for the selection and preparation, evaluation, approval and implementation of subprojects.

Table 9: Summary of the stages of the selection and responsibilities

| <i>Stages</i> | Responsible structures |
|--|---|
| <i>1. Preparation of the sub project (technical files execution of infrastructure)</i> | Technical Teams (Mali- Weather, NDH, EWS or GDCP) |
| <i>2. Filling the selection and environmental and social classification form</i> <i>2.1 Form Filling</i> <i>2.2 Project Classification and Determination of Environmental work</i> | ESSS |
| <i>3. Execution of environmental work</i> | |
| <i>3.1 Consultant Selection</i> | PMU/GDCP (in relation with ESSS EU / EDH or METO) |
| <i>3.2 Implementation of ESMP</i> | ESIA Consultants |
| <i>4. Review and approval of ESMP</i> | Interministerial Committee |
| <i>5. Dissemination</i> | MESSD |
| <i>6. Integrating environmental and social provisions in the bidding dossiers and of works</i> | ESSS |
| <i>7. Surveillance and Monitoring and Evaluation</i> | Environmental and Social Monitoring: ESSS Project Internal monitoring: METO External monitoring: MESSD Assessment: Consultants (national and / or international) |

10.3. Analysis of environmental and social capacities – capacity building measures

The consideration of environmental and social aspects in the project must concern primarily the Ministry of Environment, Sanitation and Sustainable Development, the Ministry of Equipment, Transport and Opening up (METO) MWA / NDH / EWS / GDCP, local authorities, to ensure that national and the World Bank regulations are respected.

10.4. Recommendations for the environmental and social management project

The consideration of environmental and social aspects in the ESMF must be guaranteed in order to ensure that the sub-projects will not cause significant negative impacts that could annihilate all the expected positive effects. The environmental and social management of the project activities will also require the establishment of capacity building measures as described below.

The implementation of the ESMP will require different measures, notably: (i) institutional strengthening of the Project by the recruitment of the SEA expert, boosting of EU / MWA / NDH / EWS / GDCP, putting in place a partnership with the Ministry of Environment, Sanitation and Sustainable Development; (ii) the provision for environmental and social assessment (ESIA, ESMP, RAP) and their implementation; (iii) strengthening the capacities of actors (iv) information and awareness programs; (v) the provision of grants for the implementation of any ESMP or specific measures; (vi) monitoring and evaluation of the execution of the ESMP; (vii) compliance with safeguard policies.

These technical support actions, training and awareness aim at: (i) to operationalize the strategy for environmental management of the Project; (ii) encourage the development of local expertise and professionals in environmental and social management; (iii) raise the level of professionalism and responsibility in environmental management; (iv) protecting the environment, health and safety of the beneficiaries.

10.4.1. Institutional strengthening measures

These measures will include, in emergency and short-term, (i) to recruit (part time for about 2 years) an Expert in Environmental and Social Assessment (ESA Expert) to support the preparation and implementation of project to help revitalize the EU / MWA / NDH / EWS / GDCP, support in the establishment of a partnership with the Ministry of Environment, Sanitation and Sustainable Development for approval of studies and external monitoring as well as social aspects. These partnerships should be formalized through collaboration Protocols.

Strengthening the Environmental Units of MWA /NDH /ESW / GDCP

The SEA Expert will also be responsible to support the performance of Environmental Units MWA / NDH /ESW / GDCP who will fully ensure, at the end of the project, the Environmental and Social function, with the main tasks of:

- implement this environmental and social management framework and the application documents follow by, the ESMP and RAP potential subcomponents;
- ensure the interface of the PMU and SDEE for everything related to the application of ESMF, RPF, ESMPs and RAP;
- ensure that companies and mission control, meet their environmental commitments;
- carry out controls at construction sites to ensure that social and environmental measures are addressed;
- intervene urgently to any incident or accident that requires verification and control;
- notify any breach of the companies involved in the project contractual commitments to environmental and social management;
- inform affected communities and NGOs of their right and obligation regarding the implementation of the project;
- ensure that the complaints of the population are identified and properly addressed;
- ensure that national regulations and safeguard policies of the World Bank are respected in the phases of preparation and during the work proper.

Descriptive sheets of Environmental Counsellors positions define the tasks (coaching, coordination and supervision of different managers), the reporting lines with respect to the one in charge of the environmental unit. Their activities and responsibilities mainly concern: database design, tools; proposals for preventive and remedial measures to help improve the environment; the preparation of environmental testing protocols, conduct an environmental audit of the equipment, prepare the guidelines, procedures and methods to Mali-Weather Agency / NDH /ESW / GDCP to respect the laws and rules of the art in Environmental Protection).

10.4.2. Technical Capacity measures

The strengthening of the technical Measures is involved in the following activities.

- Provision for the achievement and implementation of the ESIA: The installation of the lines, installation of generators and development of reserved depending on the number of selected sites or axes that will result in the realization of ESIA. In these cases, the project should make provision to ensure consultants to conduct these studies and implement ESMP relating thereto. Implementation of any PGES could cause measures with costs and which should be budgeted now by the project to be executed in due course. For this it is necessary to make a provisional endowment that will support all measures.
- Technical inspection measures for construction buildings: In case of construction / rehabilitation of buildings, it is suggested to carry out technical inspections of infrastructure security
- **Monitoring and evaluation of project activities:** The monitoring program will focus on permanent monitoring, supervision and evaluation.

10.4.3. Training measures for actors

For an upgrade and better sharing of backups of documents, it is necessary for the project to organize a training workshop and capacity building of stakeholders involved in environmental and social management of the project: PMU EU / HRE, technical service of MWA / NDH /ESW / GDCP and METO, MESSD, etc. Furthermore, the workshop will help to understand the environmental and social challenges of the project and potential impacts of environmental regulations applicable to the project; guidelines and backup tools from the World Bank; the provisions of ESMF, of the procedure for selection and environmental responsibilities in the implementation of good environmental and social practices; environmental control of construction sites and environmental monitoring.

10.4.4. Information and awareness of people in the project area

The SEA Expert EU / MWA / NDH /ESW / GDGP and METO will coordinate the implementation of information and awareness campaigns for local authorities' beneficiaries of infrastructure projects, especially on the nature of work and environmental and social issues in the implementation of project activities. In this process, local associations and NGOs should be involved in the foreground. In this context, local elected officials and their technical teams should be more trained to better manage these activities. The production of educational materials should be developed and it is important to use rationally all existing channels and media for the transmission of appropriate messages. The public media play an important role in raising awareness of the population. The federal structures of NGOs will also be put in place for public awareness

10.4.5. Compliance measures with the Environmental and Social Safeguard Policies

In addition, this chapter identifies the measures and strategies envisaged to comply with these policies. The installation of the lines, installation of generators and development of selected depending on the number of selected sites or axes will result in the realization of ESIA. In these cases, the project should make provision of consultants' services to conduct these studies and implement related ESMP. Implementation of any PGES could cause measures with costs and which should be budgeted now by the project to be executed in due course. For this, it is necessary to make a provisional endowment that will support all measures.

10.5. Environmental and social monitoring program

10.5.1. Monitoring and Evaluation

Monitoring and evaluation are complementary. The monitoring aims to correct "real time", through ongoing monitoring, implementing interventions and infrastructure operating methods. As for the evaluation, it is intended (i) to ascertain whether the objectives have been met and (ii) to draw operational lessons to modify future intervention strategies.

Environmental and social components to follow

During the works, monitoring will include the effectiveness of the implementation of the mitigation measures included in the ESMP. The environmental and social components that will need to be followed are: watercourses (disruption during the works); soil susceptibility; land acquisition and disruption of agricultural and socio-economic activities; the health of the populations and workers (hygiene, HIV / AIDS, accidents, etc.).

In each project intervention site, indicators and technical elements are proposed to be followed by the ESSS of the Project in connection with EU / MWA / NDH /ESW / GDGP, METO but also national and departmental services of the environment and Forestry and the local authorities.

10.5.2. Institutions responsible for monitoring

- The ESSS of the project will be responsible for the Environmental and social monitoring.
- Internal monitoring of the implementation of the components will be provided by the METO or (EU / MWA / NDH /ESW / GDGP).
- External monitoring will be conducted by the MESSD, the Local Authorities, etc.
- The evaluation will be carried out by the consultants (national and / or international), at the end of the project. The final evaluation will be done once for all executed sub-projects.

10.5.3. Monitoring Indicators

Indicators are parameters whose use provides quantitative and qualitative information on the impacts and environmental and social benefits of the project. In order to assess the effectiveness of project activities, environmental and social indicators of monitoring are here by suggested:

The strategic indicators order

Strategic indicators to follow are as follow:

- Effectiveness of environmental and social selection and implementation of ESIA;
- Number of organized training / awareness sessions;
- Number of environmental monitoring and evaluation mission.

Indicators to be monitored by the Environmental Unit of MWA / NDH /ESW / GDCP

- Number of projects that pass through environmental and social selection;
- Number of projects that pass through ESIA with ESMP implemented;
- Number of tender files and execution that are integrated in the environmental and social requirements.

The strategic indicators order to monitor

Strategic indicators to follow are as follow:

- Effectiveness of the environmental and social selection (Screening) of project activities;
- Number of actors trained / educated in environmental and social management;
- Number of realized environmental and social monitoring missions.

Table 11. Environmental and social monitoring Canvas during construction

| Elements | Impacts and follow up measures | Responsibility | | Indicators | Frequency | Cost estimate |
|--|--|----------------|--|----------------------------------|-----------|---------------|
| | | Supervision | Follow-up | | | |
| Air | <u>Air pollution</u> Dust pollution from the work Monitoring the air pollution | SEA Expert | MMA/ NDH /ESW / GDCP or METO MESSD Communities | Standards of air quality | monthly | 10 000 000 |
| Water | <u>Water Pollution:</u> Pollution monitoring and disruption of waterways Monitoring of activities using water resources | SEA Expert | MMA/ NDH /ESW / GDCP or METO MESSD Communities | Standard of water quality | monthly | 10 000 000 |
| Soil | <u>Land degradation:</u> soil erosion control during construction Control of land reclamation measures Monitoring of discharges (cuttings) and various soil pollution | SEA Expert | Mali-Weather Agency NDH /ESW / GDCP or METO MESSD Communities | Quantity of releases to soil | monthly | 5 000 000 |
| Vegetation | Control of deforestation and tree felling Evaluation of measures of reforestation / plantations and regeneration rate | SEA Expert | MMA NDH /ESW / GDCP or MESSD Communities | Number of trees planted / felled | monthly | 5 000 000 |
| Cultural Heritage | Follow-up in the event of discovery of archaeological remains Follow up of sacred places | SEA Expert | MMA NDH /ESW / GDCP or METO MESSD Ministry of Culture Communities | Absence of destruction | quarterly | RAP |
| living and natural environment framework | <u>Pollution and nuisances:</u> Monitoring of collection and waste disposal practices Control of cuttings discharges and other places residues from construction sites | SEA Expert | MMA/ NDH /ESW / GDCP or MESSD Communities | Absence of waste | Daily | RAP |
| | <u>Loss of land, crops and homes:</u> Monitoring the effectiveness of compensation paid to people for loss of property or housing from affected villages and towns Control of the occupation of the grip of the line (fields, pastures, fallow land, etc.) Checking the resettlement program of the eventually displaced population | SEA Expert | MMA NDH /ESW / GDCP or MSPLA Communities | Number of people compensated | quarterly | RAP |
| | <u>Social conflicts:</u> Monitoring compliance with cultural sites Control of cohabitation site personnel with host populations | SEA Expert | MMA/ NDH /ESW / GDCP or Social services Communities | Number of Complaints | quarterly | RAP |
| | <u>Sanitary, health and safety measures:</u> Check the efficiency of the measures recommended by the project | SEA Expert | Mali-Weather Agency/ NDH /ESW / GDCP or METO | No occupations | Daily | RAP |

| | | | | | | |
|--------------|---|--|--|--|--|-------------------|
| | Application of health, hygiene and safety Control the provision of security precautions Providing adequate equipment and port protection for site personnel Monitoring compliance with the enforcement of labor laws | | | | | |
| Total | | | | | | 30 000 000 |

10.6. Institutional arrangements for the implementation and monitoring

Under the project, the "Environmental and Social" function could be performed at different levels:

- The Ministry of Equipment, Transport and Opening up (METO) and EU / Mali-Weather Agency / NDH /ESW / GDCP for a strategic coordination (ensuring that all stakeholders are involved and assume fully their missions);
- The Ministry of Environment, Sanitation and Sustainable Development (MESSD) which is the national institution responsible for the coordination and monitoring of ESIA and whose services will be responsible for carrying out external monitoring of the implementation ESMF work;
- A SSES will be recruited (as part-time by the Project) which will ensure the internal monitoring near respectively in the preparation phase (studies) and execution of work at the local level (in the project areas).

Institutional arrangements below are proposed project regarding the roles and responsibilities for implementation and monitoring of the project. These arrangements will be discussed with key stakeholders in the implementation and monitoring of the project. The Consultant considered the sovereign functions of each of the targeted structures.

10.6.1. Coordination, preparation and supervision during construction

- **The Ministry of Equipment (Infrastructure), Transport and Opening up (METO)** partially ensures the project supervision will also coordinate and be responsible for overseeing the implementation of environmental monitoring of the project.
- **The SSES** will coordinate the local monitoring of environmental and social aspects of the Project's work in connection with EU /MMA / NDH /ESW / GDCP and METO. He cannot perform any EIS for this project.
- **The SSES** will fill the environmental and social screening sheets and proceed with determining the appropriate environmental categories, in relation to EU / MMA / NDH /ESW / GDCP or METO. He will lead the implementation of any ESIA and training / awareness program. He will also conduct the choice of appropriate mitigation measures in case of need to develop ESMP for projects. He will also coordinate the monitoring of environmental aspects and interface with other actors.

10.6.2. Implementation and close monitoring

- **Contracting Enterprises (SMEs):** They must carry out environmental and social measures and respect the directives and other environmental requirements contained in the project work contracts. The enterprises prepare and implement their own ESMP Enterprise (ESMPE). To this end, companies will have a Head of Hygiene Safety Environment.
- **The Design Offices (Consultants) and Control and specialized NGOs:** They ensure the mastery of delegated project for Local Authorities and must ensure control of the effectiveness and efficiency of the implementation of environmental and social measures and compliance with guidelines and other environmental requirements contained in the project work contracts. The control offices are responsible for monitoring and implementation of ESMPE, having a specialized supervisor on Hygiene, Safety Environment in their team.
- **Local communities in the project area:** The local communities will participate in the monitoring of neighborhoods of the implementation of the ESMP recommendations, especially for information and public awareness.

10.6.3. Environmental and social monitoring

The Ministry of Environment, Sanitation and Sustainable Development: The Ministry for the Environment is mainly concerned with the project will conduct external environmental and social monitoring of the implementation of the project activities, but also the approval and distribution of potential ESMP. The project will provide institutional support to the Ministry in this monitoring process. External monitoring will also involve forest services, social services, local authorities, NGOs and local civil society.

10.7. schedule of measure implementation

The calendar of implementation and follow-up activities of the project will be as in table 11 that follows:
Table 11. Implementation of the environmental and social measures schedule

| Measures | Actions proposed | Duration of the project | | | | |
|------------------------------------|--|-------------------------|--------|--------|--------|--------|
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
| Mitigation measures | See list of mitigation by subproject | | | | | |
| Institutional measures | Recruitment of design offices and monitoring offices | | | | | |
| Technical measures | Realization of s SEIA to certain activities in the project | | | | | |
| Training | Training officers (DGPC and recipient agencies) | | | | | |
| Monitoring and evaluation measures | Follow-up and monitoring of the project | Monitoring proximity | | | | |
| | | Supervision | | | | |
| | Evaluation | final | | | | |

10.8. Estimated cost of environmental and social measures

The estimated costs for the inclusion of environmental and social mitigation measures, a total of **two hundred and forty-five million CFA francs (245 million FCFA)**, about **425 000 \$US** are distributed in table 12.

Table 12: Estimate of environmental and social measures of the ESMPF for a period of 5 years

| Activities | Quantity | Unit cost (FCFA) | Total cost (FCFA) |
|--|----------|------------------|--------------------|
| Recruitment of an Expert Cabinet ESA (annual salary/contract) | 5 | 10 000 000 | 50 000 000 |
| Realization of five (5) ESIA | | 15 000 000 | 75 000 000 |
| Strengthening the capacity of actors | 4 | 10 000 000 | 40 000 000 |
| Continuous monitoring of the implementation of the ESMPF (biannual) | 10 | 3 000 000 | 30 000 000 |
| Assessment (midterm and final) of the implementation of the ESMPF (Annual) | 5 | 10 000 000 | 50 000 000 |
| Total | | | 245 000 000 |

11. CONCERTATION WITH STAKEHOLDERS

11.1 Organization

Consultations with stakeholders in this context replace conventional public consultations that characterize participatory option announced in the methodology. All stakeholders of a project have the liberty of speech and a concerted action on the impact of project activities on the environment. Since all the locations of various civil infrastructure and equipment are not yet clearly defined, the consultation mainly concerned the main actors of the project.

The discussions were conducted in the offices of officials or in meeting halls when needed to meet many people. During the meetings, the objectives and activities of the project, in terms of economic, sociocultural and environmental issues were presented and discussed with key stakeholders in the administrative and municipal structures, but also with representatives of the Malian civil society organization.

11.2. Results

It is generally observed that the concerns are the same and that the project is rather well accepted by the various partners. The overall assessment of a low environmental and social impact project seems to be well received. The validation session before the Interministerial Technical Committee (Figure 6), in addition to its statutory character assessment, has also turned into a broad debate on the opportunities and constraints of this project.



Figure 6: Bamako ESMF validation workshop

The main recommendations from these interviews are:

Planning / preparation:

- construction of infrastructure and equipment
- strengthening the response capabilities
- awareness of the risks linked and arrangements
- device for prevention and early warning

Implementation

- Consultation, collaboration and synergy with other local projects
- Backup environmentally sensitive areas and protected species
- Strengthening communities and populations capabilities
- Involvement of all stakeholders
- surveillance and monitoring measures
- Service and maintenance of infrastructure
- Development of a strategic communication plan for alert conditions and mandatory reactions
- Education, awareness and training of the population to these new tools

The synthesis of these consultations is reflected in the table below, by category of actors met.

Table 13. Summary of the results of public consultations

| Institutions | Matters discussed and collected information |
|---|--|
| GDPC | Construction of infrastructure (5 relief centres; 1 Regional Direction; 1 operational Centre; etc.) Equipment (vehicles and emergency facilities) Training/capacity-building Maintenance and maintenance of infrastructure and equipment |
| Mali Meteo Agency | Capacity-building Investments: station observation; weather equipment) Development of weather products Weather stations shall not be made in cities Maintenance and maintenance of infrastructure and equipment |
| National Directorate of Hydraulic (DNH) | Followed by stations (the DNH provides daily monitoring of the level of watercourses and piezometers) Equipment for monitoring; database; etc. |
| AEDD | The ESIA process is driven by the NDSPNC |
| CSA/EWS | Improving the collection of data Training of staff to accomplish its mission |
| National sanitation pollution and nuisance control (NDSPNC) | Existence of an environment Act, which regulates EIAs and implementing legislation The NDSPNC is a key player in the Project (followed by implementing screening; validation of the ESIA;) Plan a validation of the ESIA session Inspection and monitoring measures |
| Mamadou Ben Cherif DIABATE (NGO SOS-Culture Kelemonzon Agency presentation) Alkaou KANOUTE (SECO-NGO ASSAFEDE, UJUEMOA / Mali) | OK for the Project and the procedures adopted by the Government of Mali Awakening of consciousness of the population by improving the dissemination of environmental and social information and training-education of end users Strengthening governance in the exploitation of natural resources Food Security Plan of Development for the most vulnerable Developing a Strategic Plan of Communication for the implementation of the disaster risk reduction |

3. CONCLUSION

This Environmental and Social Management Framework was developed to meet the environmental requirements of the project and its subcomponents. The legal framework and institution of Mali regarding environmental management is sufficiently expanded. Several texts comply with safeguard policies of the World Bank or other international institutions. The impacts of this project were qualified from moderate to weak, look insignificant. The proposed mitigations measures are therefore able to reduce and even eliminate any negative effects. The Environmental and Social Management Framework has been estimated at **245 million CFA** francs or approximately **425,000 US dollars**. Due to some operational constraints, consultations of project stakeholders were preferred to conventional public consultations.

ANNEXES

Annex 1: Environmental and Social Selection Form

Project location.....

Project managers:

Part A: Brief description of the work

.....

Part B: Identification of social and environmental impacts

| Environmental and social concerns | Yes | No | Observation |
|---|-----|----|-------------|
| Ressources of the sector | | | |
| Does the project need the significant volumes of construction materials in local natural resources (sand, gravel, laterite, water, construction timber, etc.)? | | | |
| Does it require clearing | | | |
| Biodiversity | | | |
| Will the project be detrimental on rare species, vulnerable and / or economically, ecologically, and culturally important? | | | |
| Are there any areas of environmental sensitivity that might be negatively affected by the project? forest, wetlands (lakes, rivers, seasonal flood plains) | | | |
| Protected areas | | | |
| The project area (or its components) does it include protected areas (national parks, national reserves, protected forests, world heritage site, etc.) | | | |
| If the project is outside, but close to protected areas, could it adversely affect the ecology within the protected area? (Eg interference with bird flights with mammalian migrations) | | | |
| Geology and Soils | | | |
| Are there unstable areas from a geological point of view or soil (erosion, landslide, collapse)? | | | |
| Are there areas at salinization risk? | | | |
| Aesthetic landscape | | | |
| Does the project have an adverse effect on the landscape values? | | | |
| Historical, archaeological or cultural | | | |
| Could the project change one or more historical, archeological, or cultural sites, or does it require excavation? | | | |
| Loss of assets and other things | | | |
| Does the project triggers the temporary or permanent loss of habitat, crops, agricultural lands, pastures, fruit trees and household infrastructure? | | | |
| Pollution | | | |
| Will the project result in a high level of noise? | | | |
| Will the project generate solid and liquid waste? | | | |
| If "yes" does the infrastructure has a plan for the collection and disposal | | | |
| Are there facilities and infrastructure for it management? | | | |
| Is the project going to affect the quality of surface water, groundwater and drinking water sources? | | | |
| Will the project has an effect in the atmosphere (dust, various gases) | | | |
| Life style | | | |
| Can the project cause alterations in the lifestyle of the local people? | | | |
| Will the project result in a widening of social inequalities? | | | |
| Will the project result in incompatible applications or social conflicts between different users? | | | |
| Health security | | | |
| Will the project lead to the risks of accidents for workers and populations? | | | |
| Is the project going to cause health risks to workers and the population ? | | | |
| Will the project result in a population increase of disease vectors? | | | |
| Local revenues | | | |
| Will the project help in the creation of jobs? | | | |

| | | | |
|---|--|--|--|
| Does the project promote the increase of agricultural production and others? | | | |
| Gender preoccupation | | | |
| Does the project encourage the integration of women and other vulnerable groups? | | | |
| Does the project support women's concerns and does it promote their involvement in decision making? | | | |

Public consultation

Were the consultation and public participation popular?

Yes ___ No ___

If "Yes", briefly describe the measures taken for this purpose.

Part C : Mitigation

In view of the Annex, for all the answers "Yes" briefly describe the steps taken for this purpose.

Part D: Project classification and environmental work

Type of project: A (not fundable) B C

- Category C: environmental work will not be necessary
- Category B: the application of simple mitigation measures will suffice (ESMP); or an Environmental and Social Impact Assessment (ESIA) will be separately carried out;
- Category A: not fundable.

Travail environnemental nécessaire :

No environmental work

Simple mitigation measures (ESMP)

Environmental Impact Assessment

Note: This form is to be filled while taking into account environmental and social checklist results in Annex 2 below.

Annex 2: Environmental and social clauses

These clauses are intended to help the people in charge of writing micro files so that they can integrate in these documents the requirements for optimizing the environmental and socio-economic background.

Environmental Guidelines for Contracting Companies

Overall, the companies in charge of construction and rehabilitation of structures must also comply with environmental and social directives:

- Having the necessary permits in accordance with the laws and regulations
- Establish a site regulation (what is allowed and does not allow in yards)
- Conduct an information and awareness campaign for residents before work
- Ensure compliance with health and safety measures for site installations
- Conduct signalling works
- Employ local labour priority
- Ensure compliance with safety rules during work
- Protect neighbouring properties of the site
- Avoid maximum production of dust and noise
- Ensure the collection and safe disposal of waste from work
- Conduct awareness campaigns on STI / HIV / AIDS
- Closely involve local technical services in monitoring the implementation
- Ensure compliance with plant species protected during work
- Provide protective equipment to workers

Compliance with national laws and regulations:

The Contractor and its subcontractors must: know, respect and apply the laws and regulations in the country and on the environment, disposal of solid and liquid waste, the rejection and noise standards, working hours, etc .; take all appropriate measures to minimize environmental damage; assume responsibility for any claims related to non-compliance of the environment.

Permits and approvals before work

Any construction works must be subject to prior information procedure and administrative permissions. Before starting work, the contractor must obtain all permits necessary for the implementation of work under the contract of the road project authorizations issued by local authorities, forest services (in case of deforestation, pruning, etc.), network managers, etc. Before starting work, the Contractor must consult the residents in order to facilitate arrangements for the progress of projects.

Works Start off Meeting

Before starting work, the Contractor and the Project Manager shall organize meetings with the authorities, representatives of the populations in the project area and the relevant technical services, to inform them of the consistency of the work to be performed and duration, affected routes and locations likely to be affected. This meeting will also enable the Project Manager to obtain the people observations, make them aware of the environmental and social issues and their relationship with workers.

Preparation and release of the site- Respect rights of way and tracks

The Contractor shall inform the people concerned before any destruction of fields of activity, orchards, vegetable required as part of the project. The release of the grip must be on a schedule defined in agreement with the affected population and the project manager. Before installing and starting work, the contractor must ensure that the compensation is actually paid to the person concern by the project manager. The Contractor must comply with the rights of way and plots defined by the project and for no reason will it change. All damages related to non-compliance paths and rights of way defined are his responsibilities and repairs at his expense.

Locating dealers' network

Before starting work, the contractor must instruct a registration procedure dealer networks plan (water, electricity, telephone, sewer, etc.) to be formalized with the Minutes signed by all parties (Entrepreneur, project manager, dealers).

Release of public and private domains

The Contractor must know that the scope of public interest related to the transaction is the perimeter likely to be affected by the work. Work cannot begin in the areas covered by the private rights that can only be when they are released after an acquisition procedure.

Environmental and Social Management Program:

The Contractor shall develop and submit for the approval of the Project Manager, a comprehensive program of environmental and social management of the site.

Display of internal regulations and staff awareness

The Contractor shall post a visible rule in the various base-living facilities prescribing specifically: respect for local customs and traditions; protection against STI / HIV / AIDS; the rules of hygiene and safety measures. The Contractor shall make its employees including respect for customs and traditions of the people of the region where the work is executed and the risks of STIs and HIV / AIDS.

Employment of local labour: The Contractor shall engage (apart from its technical management staff) the best possible workforce in the area where the work is done.

Compliance with work schedules: The Contractor shall ensure that work schedules respect the national laws and regulations. The Contractor must avoid to perform the work during off hours, Sundays and public holidays.

Protection of site personnel: The Contractor must provide site personnel with regulatory working outfits in good condition, and all protective equipment and own safety in their activities (helmets, boots, belts, masks, gloves, goggles, etc.). The Contractor must ensure strict wearing of protective equipment on site. A permanent control must be done for this purpose and, in case of breach; enforcement action (warning, suspension, dismissal) must be applied to the staff involved.

Health, Safety and Environmental Manager

The Contractor must appoint a Health / Safety / Environmental manager who will ensure that the rules of hygiene, safety and environmental protection are rigorously followed by all and at all levels of the execution, as for workers population and others in contact with the site. It must develop a common medical emergency service and the basic life, adapted to the size of its staff. The Contractor must prohibit access to the site from the public, protect it with tags and signs, indicating the different access and take all measures of order and safety to avoid accidents.

Measures against obstruction of traffic

The Contractor must avoid obstructing public access. He must maintain permanently the movement and access of residents during construction. The Contractor shall ensure that no excavation or trench remains open at night without proper signage accepted by the Project Manager. The Contractor must ensure that temporary deviations permit safe traffic.

Construction and redevelopment downturn: A full release site, the contractor leaves the premises clean for their immediate assignment. It may not be released from his obligations and responsibility regarding their use without having formally been observed in a good state. The Contractor will perform all the necessary amenities in the rehabilitation of the premises. It must withdraw all its equipment and materials and cannot abandon on the site or nearby.

Protection of unstable areas:

During the dismantling of structures in unstable environments, the contractor must take the following precautions to avoid increasing ground instability: (i) avoid heavy traffic and overloading in the zone of instability; (ii) preserve as much as possible the plant cover or rebuild it using appropriate local species in case of erosion risks.

Notification of findings

The Project Manager shall notify the Contractor in writing all cases of default or non-performance of environmental and social measures. The Contractor shall rectify any breach of the requirements duly notified to him by the Project Manager. The resumption of work or additional work resulting from non-compliance with the clauses is the responsibility of the Contractor.

Sanction

In applying contractual provisions, non-compliance with environmental and social clauses, duly noted by the Project Manager, can be a reason for terminating the contract.

Signaling works

The Contractor shall place prior to the opening of building sites and whenever necessary, a pre-signaling and signaling long-distance sites (quarries outlets or life-bases, circuit used by machinery, etc.) that meets the laws and regulations.

Protection of agricultural works and areas

The work schedule should be established to minimize disruption of agricultural activities. The main periods of agricultural activity, (seeds, harvest, drying,) should especially be known to adapt the timetable for these periods.

Protection of wetlands, flora and fauna

It is forbidden to the Contractor to carry out temporary installations (storage areas and parking, bypass roads or work, etc.) in wetlands

Protection of sacred sites and archaeological sites

The Contractor shall take all necessary measures to respect the worship and cultural sites (cemeteries, sacred sites, etc.) in the vicinity of the work and do not carry their attacks. For this, it must first ensure their typology and their location before works begin. If, during construction, the remains of worship, historical or archaeological interest are discovered, the contractor must follow this procedure: (i) stop work in the area; (ii) immediately notify the Project Manager who must make arrangements to protect the site to avoid destruction; a protected area must be identified and materialized on the site and no activity will take place there; (iii) refrain from removing and moving objects and relics. Work must be suspended within the scope of protection until the national organization responsible for historical and archaeological sites have given permission to continue.

Tree-cutting measures and deforestation

In case of deforestation, felled trees should be cut and stored in places authorized by the Project Manager. The local population must be informed of the possibility for them to be able to have this wood at their convenience. Felled trees should not be left behind, or burned or fled under the earth materials.

Prevention of bushfires

The Contractor is responsible for the prevention of bush fires on the scope of its work, including borrowing and access areas. It must strictly observe the instructions, laws and regulations enacted by the competent authorities.

Solid waste management

The Contractor shall deposit garbage in sealed bins and to be emptied periodically. In case of evacuation by trucks of construction, dumpsters must be watertight to prevent the escape of waste.

Protection against noise pollution

The Contractor shall limit construction noises likely to seriously annoy the residents or by an excessively long either by their extension outside normal working hours. The thresholds are not to exceed 55 to 60 decibels by day; 40 decibels at night.

Prevention against STI / HIV / AIDS and related diseases in the work

The Contractor must inform and sensitize its staff on the risks related to STI / HIV / AIDS. It must make available personnel condoms against STIs / HIV-AIDS. The Contractor shall provide the following preventive measures against the risk of disease: (i) establish the wearing of masks, uniforms and other appropriate footwear/security shoes; (ii) systematically install infirmaries and provide free to site personnel the basic drugs needed for emergency care.

Construction Journal

The Contractor shall maintain a site logbook in which complaints will be recorded, breaches or incidents have a significant impact on the environment or incident with the population. The site diary is unique for the site and the notes must be written in ink. The Contractor must inform the general public and local residents in particular, the existence of this newspaper, indicating the place where it can be accessed.

Annexe 3: Environmental and Social Safeguard Policies of the World Bank

The World Bank's environmental and social safeguard policies include both, Operational Policies (OPs) and Bank Procedures (PB). Backup policies are designed to protect the environment and society against the potential negative effects of projects, plans, programs and policies. The policies of the most common environmental and social safeguards are: OP/BP 4.01 environmental assessment, including the Participation of the Public; OP/BP 4.04 Natural Habitats; OP/BP 4.09 Pest; OP/BP 4.11 Physical Cultural Resources OP/BP 4.12 involuntary Resettlement; OP/BP 4.10 Indigenous People; OP/BP 4.36 Forests; OP/BP 4.37 Dams Safety; OP/BP 7.50 Projects in International Waterways; OP/BP 7.60 Projects in Disputed Areas.

OP/BP 4.01: Environmental Assessment: OP/BP 4.01 aims to ensure that Projects financed by the World Bank are viable and environmentally feasible and that the decision-making is improved through appropriate analysis on their probable environmental impacts (OP/BP 4.01). This policy is triggered, if a project has likely potential environmental impacts (negative) in its area of influence. OP/BP 4.01 covers impacts on the physical environment (air, water and land); the quality of life, health and security of the populations; physical cultural resources; and cross-border and global environmental concerns. The project triggers this policy because certain activities may be subject to an environmental impact study.

Distribution: OP 4.01 also describes the requirements for consultation and dissemination. For category: (i) projects A and B; and (ii) sub projects classified as A and B in a programmatic loan, the borrower consults project affected groups and Non-Governmental Organizations (NGOs) about the project's environmental aspects and takes into account their views . The Borrower starts this consultation as soon as possible. For Category A projects, the borrower consults these groups at least twice: (a) shortly before the environmental selection and end of the drafting of terms of reference for the ESIA is prepared. In addition, the borrower consults with such groups throughout the implementation of the project as often as necessary to address the issues affecting the ESIA. The Borrower provides relevant information quickly enough before the consultations, and in a language accessible to the groups being consulted.

The Borrower makes available the draft ESIA (for projects in category A) or separate ESIA report (for category B projects) in the country and in the local language in a public place accessible to affected groups the project and local NGOs prior to assessment. Authorized by the Borrower, the Bank will disseminate appropriate reports to Infoshop. The sub-projects of category A will not be funded under this program is classified as Category B.

OP/BP 4.04: Natural Habitats

OP / BP 4.04, Natural Habitats, do not allow the financing of degrading or converting critical habitats projects. Natural sites of special interest and which are important for the preservation of biological diversity or because of their ecological functions. Natural habitats deserve special attention during the realization of environmental impact assessments. The CRP does not provide for construction of buildings on natural habitats sites. Only piezometers will be installed on some rivers. In this respect, the CRP does not trigger this policy.

OP/BP 4.09 : Pest Control: This policy supports integrated pest control approaches. It identifies pesticides which can be financed under the Project and develop an appropriate plan of pest control to deal with the risks. The policy is triggered if: (i) the acquisition of pesticides or pesticide application equipment is envisaged; (ii) the Project supports an activity that requires the use of pesticides that can create negative effects on the environment. This policy is not triggered.

OP/BP 4.10: Indigenous People: Indigenous peoples, in the direction of the Bank, do not exist in Mali. Consequently, the Project is in accordance with this backup policy, without any need to take specific measures.

OP/BP 4.11 : Physical Cultural Resources: This policy a survey of potentially affected cultural resources and their inventory. It incorporates mitigation measures when there are negative impacts to cultural resources. Mali has a relatively rich cultural heritage, but that is not specifically covered by the activities of the Project. However, the Project is not based specifically on archaeological or cultural relics sites for the realization of infrastructure and equipment. This policy is triggered not by the Project.

OP 4.12, Involuntary Resettlement population: The objective of OP 4.12 is to avoid or minimize involuntary resettlement where feasible, exploring all other alternatives ways of viable projects. In addition, OP 4.12 intends to provide assistance to displaced people by improving their former living standards, the ability to generate revenue, production levels, or at least to restore them. The project includes activities that could lead to a

relocation (loss of property and assets) may cause population displacement or loss of land. Despite many similarities, Malian regulation (procedures and practices) on involuntary displacement and the provisions of OP 4.12 of the World Bank have some differences:

- At the definition of eligibility criteria and categories of impact entitlement to compensation. According to Malian legislation, only those with legal rights over the occupied lands are eligible for compensation. According to OP. 4.12 World Bank, the following categories of persons are eligible for compensation: holders of a formal and legal rights to the land, including customary rights recognized by the National Land Code of the Republic of Mali; people who do not have formal rights to the land at the time the census begins but who have claims on these lands; people who have no formal rights or titles may be recognized on the land they occupy.
- The national policy and the World Bank's policy differ on the definition of damage incurred. According to Malian law, expropriation compensation should only cover the damage directly caused by it. The World Bank requires compensation that covers the assistance required by the PAP so that they recover at least the standard of living they had before the project.
- Finally, there are other differences between the two regulations in particular regarding the participation of affected people in the development and implementation of Resettlement Action Plan (RAP). The fundamental difference with OP 4.12, covers the following points: No description of the consultation strategy resettled persons of host communities and participation of the latter in the design and implementation of resettlement activities; no particular attention to the views expressed and how these views have been taken into account in preparing the resettlement plan; the absence of resettlement alternatives presented and the choices made by the displaced in terms of options available to them; no institutionalized channels through which displaced people can communicate their concerns to the authorities of the project throughout the planning and implementation.

Other differences concern (i) the illegal occupants (whose determination and status are not clearly described) compensation options (the national legislation does not provide, apart from compensation and / or the allocation of new land, employment or as granting work alternative compensation), vulnerable groups (the Malian legislation did not provide special provisions for vulnerable groups, deadlines for compensations (no time is provided in national law), the move of PAP, relocation costs, economic rehabilitation (not mentioned in national legislation), and monitoring and evaluation (not mentioned in national legislation).

Whenever there is a difference between the two procedures, the provisions of OP 4.12 will be applied.

OP 4.36: Forestry: OP 4.36 provides the support-oriented and sustainable forestry on the conservation of the forest. It does not support commercial exploitation in primary rainforests. Its overall objective is to reduce deforestation, to strengthen the contribution of the woodland to the environment, to promote afforestation. The Project does not raise this policy because it provides no logging activities.

OP 4.37, Dam Safety: OP 4.37, *Dam Safety* recommends large dams for the realization of a technical study and periodic security inspections by independent experts in the safety of dams. The project does not trigger this policy because its activities will not affect the construction or management of dams.

OP 7.50, Projects in international waterways: OP 7.50, Projects affecting international waters, checks that there are riparian agreements and guarantees that the littoral States are informed and no objection against the interventions of the Project. There is no public consultation but notification to residents is a requirement. The Project includes activities limited to very small scale that should not affect the use of the water in international watercourses that may be detrimental to other riparian States. In this respect, the project does not trigger this backup policy.

OP 7.60, Projects in disputed areas: The OP 7.60 shall guarantee that persons claiming their right to the disputed areas have no objection to the proposed project. There are no litigation areas in Mali. As a result, the project does not raise this safeguard policy.

In conclusion, the environmental and social safeguard policies of the World Bank that may apply to sub-projects that will be conducted as part of the implementation of the program are: OP 4.01 "Environmental Assessment"; OP 4.12 "Involuntary Resettlement of people." The program should consider activities that trigger the indicated above policies and compliance measures are proposed in this ESMF. The remaining operational policies are not triggered by the CRP.

Annexe 4 : Environnemental Licence

MINISTRE DE L'ENVIRONNEMENT,
DE L'ASSAINISSEMENT ET DU DEVELOPPEMENT
DURABLE

REPUBLIQUE DU MALI
Un Peuple - Un But - Une Foi

SECRETARIAT GENERAL

0033

DECISION N° 2016.....MEADD-SG

PORTANT DELIVRANCE DE PERMIS ENVIRONNEMENTAL AU PROGRAMME HYDROMETEOROLOGIQUE AFRICAIN PHASE I POUR SON PROJET DE RENFORCEMENT DE LA RESILIENCE CLIMATIQUE EN AFRIQUE SUB-SAHARIENNE.

LE MINISTRE DE L'ENVIRONNEMENT, DE L'ASSAINISSEMENT ET DU DEVELOPPEMENT DURABLE,

- Vu la Constitution ;
- Vu la Loi N° 01-020 du 30 mai 2001 relative aux pollutions et aux nuisances ;
- Vu la Loi N°08-033 du 11 août 2008 relative aux installations classées pour la protection de l'Environnement ;
- Vu l'Ordonnance N° 98-027/P-RM du 25 août 1998 portant création de la Direction Nationale de l'Assainissement et du Contrôle des Pollutions et des Nuisances ratifiée par la Loi N° 98-058 du 17 septembre 1998 ;
- Vu le Décret N°01-394/P-RM du 06 septembre 2001 fixant les modalités de gestion des déchets solides ;
- Vu le Décret N°01-395/P-RM du 06 septembre 2001 fixant les modalités de gestion des eaux usées et des gadoues ;
- Vu le Décret N°01-396/P-RM du 06 septembre 2001 fixant les modalités de gestion des pollutions Sonores ;
- Vu le Décret N°01-397/P-RM du 06 septembre 2001 fixant les modalités de gestion des polluants de l'atmosphère ;
- Vu le Décret N°06-258/P-RM du 22 juin 2006 fixant les conditions d'exécution de l'Audit d'Environnement ;
- Vu le Décret N°07-135/P-RM du 16 avril 2007 fixant la liste des déchets dangereux ;
- Vu le Décret N°08-346/P-RM du 26 juin 2008, relatif à l'Etude d'Impact Environnemental et Social ;
- Vu le Décret N°09-666/P-RM du 21 décembre 2009 fixant les modalités d'application de la loi N°08-033 du 11 août 2008 relative aux installations classées pour la protection de l'Environnement ;
- Vu le Décret N° 2016-0022/P-RM du 15 janvier 2016 portant nomination des Membres du gouvernement ;
- Vu l'Arrêté interministériel N°10-1509/MEA-MIIC-MEF du 31 mai 2010 fixant le montant, les modalités de paiement et de gestion des frais afférents aux activités relatives à l'Etude d'Impact Environnemental et Social ;
- Vu l'Arrêté interministériel N°2013-0256/MEA-MATDAT-SG du 29 janvier 2013 fixant les modalités de la consultation publique en matière d'Etude d'Impact Environnemental et Social ;
- Vu les résultats de la réunion du Comité Technique Interministériel du 17 mai 2016 tenue dans la salle de réunion du Centre de Formation pour le Développement (CFD) relatifs au rapport du Cadre de Gestion Environnementale et Sociale (C.G.E.S) du projet de renforcement de la résilience climatique en Afrique sub-saharienne phase I.

DECIDE :

Article 1^{er} : Il est délivré **AU PROGRAMME HYDROMETEOROLOGIQUE AFRICAIN PHASE I** le présent permis environnemental pour la réalisation de son projet de renforcement de la résilience climatique en Afrique sub-saharienne phase I.

Article 2 : le **PROGRAMME HYDROMETEOROLOGIQUE AFRICAIN PHASE I** est tenu de se conformer aux obligations contenues dans le rapport d'Etude d'Impact Environnemental et Social (REIES), (art. 25, D.08-346).

Article 3 le **PROGRAMME HYDROMETEOROLOGIQUE AFRICAIN PHASE I** est tenu d'exécuter le projet dans les trois ans qui suivent la délivrance du présent permis, au cas contraire, il sera soumis à nouveau à une Etude d'Impact Environnemental et Social. (art. 21, D.08-346).

Article 4 : le **PROGRAMME HYDROMETEOROLOGIQUE AFRICAIN PHASE I** doit obligatoirement soumettre son projet à l'audit de Vérification de Conformité Environnementale tous les cinq ans s'il y a lieu et avant la fin du projet en vue de l'obtention du quitus. Cet audit d'environnement est exécuté par une équipe d'audit composée d'auditeurs professionnels et/ou d'experts techniques sous la supervision de l'Administration compétente (art. 4, art.8 D.06-258 et art. 31, D.08-346).

Article 5 : Le Ministre en charge de l'Environnement peut suspendre ou retirer définitivement le permis environnemental pour l'inexécution totale ou partielle des obligations contenues dans le rapport d'Etude d'Impact Environnemental et Social (EIES) et les clauses environnementales sans indemnisation ou dédommagement. (art. 25, 33 et 34 D.08-346).

Article 6 : Le présent permis environnemental qui prend effet à compter de sa date de signature sera enregistré et communiqué partout où besoin sera.

Ampliations :

- Original/promoteur----- : 1
- MEADD-SG-CAB----- : 3
- DNACPN----- : 1
- TOUTES DRACPN----- : 09
- TOUS Gouvernorats.... : 09
- Archives ----- : 1/25

Bamako, le **20 MAI 2016**



Le Ministre

Ousmane KONE
Officier de l'Ordre National

Annex 5: List of generic mitigation measures

| Activities | Negative impacts | Mitigation measures |
|--|--|--|
| Construction (observation stations and hydrometeorological, emergency operations centers) and equipment installation | Contamination of water and soil with construction waste | Ensure collection and disposal of waste to an authorized site |
| | Social conflicts with the occupation of farmland | Prohibit installation on agricultural land |
| | Loss of crops, agricultural land and habitat | Conduct information campaigns / awareness of people with goods on construction sites (targeted meetings, etc.) |
| | | Prepare a Resettlement Plan which allows a just and fair compensation / compensation in cases of sources of income losses incurred by the work |
| | Reduction of the ozone layer | Involve Forest Services in the choice of construction sites |
| | | Provide compensatory afforestation in case of deforestation (two replacement trees for a felled tree) |
| | Loss of biodiversity | Establish barrels for the collection of waste oils in view of their possible recycling |
| | | Proceed with the solid waste collection and disposal to authorized sites |
| | | Conduct proper sanitary facilities in the life bases |
| | Water pollution and soil | Favoring manual work (excavation, etc.) |
| | | Conduct information campaigns / awareness of people with properties on the construction site (targeted meetings, etc.) |
| | | Prepare a Resettlement Plan which allows a just and fair compensation in cases of sources of income losses incurred by the work |
| | Erosion of land with the movement of construction machinery | Conduct information campaigns / awareness of people with goods on construction sites (targeted meetings, etc.) |
| | Loss of land, agricultural and socio-economic activities | place the tarpaulins on scaffolding |
| | | Oblige the wearing of individual protective equipment (IPE) for all site personnel |
| | Conflicts for land acquisition | Establish a gear of the traffic plan |
| | Dust pollution from the work | Educate machine operators |
| | Noise pollution caused by noise and vibration gear | Establish a kit for first aid for the yard |
| | Work accidents with vehicles | Educate the site staff about the risks of work |
| | | Focusing priority recruitment of local labor on site (laborers, guards, stevedores). |
| No use of the local workforce | Inform and educate the work of staff and local residents about the risks of STI / HIV / AIDS | |
| Potential risk of spread of STI / HIV-AIDS | Provide free condoms to the work of staff | |
| | Conduct information / awareness campaigns for people with goods on construction sites (targeted meetings, etc.) | |
| domestic infrastructure demolition | Preparing a Resettlement Plan which allows a just and fair compensation / compensation in cases of sources of income losses incurred by the work | |

| | | |
|--|---|---|
| | | Educate the work of staff |
| | Disruption and customs | Conduct information / awareness campaigns for people with properties on the construction site (targeted meetings, etc.) |
| | Disruption waterfront activities | Ensure collection and disposal of waste to an authorized site |
| | uncontrolled discharges of solid waste and debris | Establish a movement and deviation plan |
| | Traffic disruption | Ensure collection and disposal of waste to an authorized site |

Special case of mitigation of potential impacts of mercury during the various implementation phases of the project

| Project implementation stage | Impact | Mitigation measures | comments |
|-------------------------------------|---|---|---|
| Pre-Construction | Ignorance of workers about the impact of mercury leads to mercury contamination by negligence | Train workers before the start of the work and discuss the impact of mercury in the environment, workers' health, and the importance of safety while working with the hydrometallurgical equipment | The facilities that often include mercury are thermostats, batteries and fluorescent bulbs. |
| | Workers are at risk due to inadequate protective equipment | Provide workers with gloves, glasses, etc. as for personal equipment. In addition, provide adequate mercury removal kit to collect thermometers | A structurally sound container to be used for storage (best practice is to use the original box or container). This must be the start date clearly marked accumulation and should be kept closed. Waste streams should be separated |
| | Workers are at risk of contact with mercury during a spill | Make sure that there is a plan in case of mercury spill up to the contractor to follow the procedures for spills a) on workers; b) field | See Appendix (procedures in the event of a mercury spill on a worker) |
| Removing / Installing Equipment | Mercury thermometers due to poor handling, may fall, break and spill mercury | Train workers on mercury handling and make sure they know what to do in case of a spill. Use proper storage containers Having a plan in hand for dealing with mercury spills. See details in the text. Removing mercury in the designated area for hazardous waste | |
| | Contamination of water, soil | Use proper storage containers | In most cases, the mercury contamination is close to the surface. An investigation will be conducted to |

| | | | |
|--|-----------------------------------|--|---|
| | | | determine the amount of spilled mercury and if the surface and / or groundwater were affected. Contaminated soil excavation to 50% beyond the depth of the contamination must ensure the removal of the contaminant. Contaminated soil can be placed in drums DOT approved 55-gallon or other suitable containers for disposal off-site to a licensed facility to treat and / or dispose of waste |
| | Mercury is not adequately removed | Having a plan in place for dealing with mercury spills. See details in the text. | <p>Mercury is a hazardous waste.</p> <p>Mercury can not be thrown into sanitary sewers, septic tank, buried or thrown in a technical way to the trash.</p> <p>Mercury waste must be properly labeled and stored in an airtight container.</p> <p>Mercury waste should be separated from other waste streams when stored</p> |

Annex 6: Bibliography

- Risk Management and Disaster in Mali - Rating Country and description of the proposed priority actions: "Action Sheets" - World Bank, 2010
- The National Policy for the Protection of the Environment, MEA
- Sector Policy Urban Development (SDPU) adopted by the Government of the Republic of Mali 25 September 1996
- Development Strategy of Cities of Mali (SDVM)
- National Water Policy adopted in 2006
- National Policy on Health and Environment, MSP
- Law No. 85-53 / AN-RM of 21 June 1985 establishing administrative easements in urban planning;
- Law No. 93-008 / AN-RM of 11 February 1993 determining the conditions for the free administration of local authorities, as amended by Act No. 96056 of 16 October 1996 and amended by Law No. 99037 of 10 August 1999;
- Law No. 95-034 / AN-RM of 12 April 1995 on the code of local authorities, as amended by Act No. 98010 of 19 June 1998 and amended by Law No. 98066 of 30 December 1998;
- Law No. 96/050 of 16 October 1996 on the principle of establishing and managing the domain of local authorities;
- Law No. 035 of 10 August 1999 creating Circles of local authorities and regions;
- Ordinance No. 00-027 / P-RM of 22 March 2000 laying Domanial and Land Code, amended and ratified by Law No 02-008 of 12 February 2002;
- Decree No. 186 / PG-RM of 26 July 1986, revised in 2005, regulating the Master Plan and Schematic Summary of planning and development;
- Decree No. 01-040 / P-RM of 2 February 2001 determining the forms and conditions of allocation of land in the real estate private domain of the State;
- Decree No. 01-041 / P-RM of 2 February 2001 laying down the procedures for awarding the occupancy permit;
- Decree No. 02-111 / P-RM of 06 Mars²2002 determining the forms and land management conditions of real public areas of the State and Local Authorities;
- Decree No. 02-112 / P-RM 06 March 2002 determining the forms and conditions of land awards in the real estate private domain of local authorities;
- Decree No. 02-113 / P-RM of 6 March 2002 laying down detailed rules of organization and preparation of the real estate register;
- Decree No. 02-114 / P-RM of 6 March 2002 laying down the transfer price and royalties of urban and rural land in the private domain of the state, commercial, industrial, craft, office, dwelling or other;
- National Environment Action Plan and National Action Programs of the Convention against desertification (PNAE / PAN-CID); Ministry of Environment, Volume I Environmental diagnosis 1998
- National Environment Action Plan and National Action Programs of the Convention against desertification (PNAE / PAN-CID); Ministry of Environment, Volume II Programmes of Action 1998
- Demographic and Health Survey of Mali (DHS) III

Annex 7: Resource persons in Bamako

| | | | | |
|---|---|---|-------------|--|
| N° | Environment and Sustainable Development Agency (ESDA - Ministry of Environment, Sanitation and Sustainable Development) | | | |
| 1 | Aboubacar DIABATÉ | Directeur-Général | 66 97 58 02 | aedd@environnement.gov.ml |
| 2 | Abdoulaye DICKO | Secrétaire du Fonds Climat Mali | 76 14 06 26 | |
| 3 | Lassina COULIBALY | Représentant de l'AEDD pour la mission | 66 43 64 82 | coulibalylassina@gmail.com |
| 4 | Tieffing TRAORÉ | Point focal de la Plateforme nationale de réduction des risques de catastrophes | 64 60 38 02 | tiefingtraore@yahoo.fr |
| Agence Mali-Météo (Ministère de l'Équipement et des Transports) | | | | |
| 5 | Djibrilla A. MAÏGA | Directeur Général | 76 45 39 71 | djibamaigafr@yahoo.fr |
| 6 | Aliou TEKÉTÉ | Directeur réseau d'observation et prévisions météorologiques | 76 45 62 94 | aliou.tek@gmail.com |
| 7 | Birama DIARRA | Directeur applications météorologiques et climatiques, point focal de la plateforme RRC | 76 10 34 28 | biramadia@yahoo.fr |
| 8 | Moussa NIAMBELE | Directeur administratif et financier | 63 64 47 47 | moussaniambele@yahoo.fr |
| 9 | Daouda ZAN DIARRA | Chef de service agro-météorologique | 76 47 28 47 | ddiarra165@gmail.com |
| 10 | Tandia Fanta TRAORÉ | Chef service changements climatiques et recherches | 76 68 65 98 | courouny@yahoo.fr |
| 11 | Mamadou Adama DIALLO | Chef des services de pluies provoquées et climatique | 76 47 91 96 | madialloba@gmail.com |
| 12 | Adama KONATE | Chef service de gestion du réseau d'observation météorologique | 66 55 41 11 | konadamo@gmail.com |
| 13 | Moussa TOURÉ | Chef bureau prévisions générales | 74 50 99 31 | mositoure@yahoo.fr |
| 14 | Isaïe SOMBORO | Chef bureau communication | 66 72 08 67 | isomboro@gmail.com |
| 15 | Daba DIARRA | Chef service budget et affaires générales | 76 27 24 72 | daba-diarra11@gmail.com |
| 16 | Mamady A. DICKO | Conseiller qualité | 76 45 53 83 | mamadoudicko@yahoo.fr |
| Direction Nationale de l'Hydraulique (DNH – Ministère des Mines, de l'Énergie et de l'Eau) | | | | |
| 17 | Boubacar YAYA | Directeur national adjoint | 76 05 13 51 | yaya.boubacar@yahoo.fr |
| 18 | Mama YENA | Chef de section eaux de surface | 66 79 69 96 | mamayena@yahoo.fr |
| Commissariat à la Sécurité Alimentaire (Présidence de la République) | | | | |
| 19 | Samba DOLLO | Responsable du département production prévention gestion de crises alimentaires | 66 78 36 47 | dollo_samba@yahoo.fr |
| 20 | Mary DIALLO | Coordonnateur national du Système d'Alerte Précoce (SAP) | 76 22 06 67 | marysap2@yahoo.fr |
| 21 | Mamy COULIBALY | Coordinateur National adjoint du SAP | 76 46 38 49 | mpaara1@gmail.com |
| Direction Générale de la Protection Civile (DGPC – Ministère de la Sécurité et de la Protection Civile) | | | | |

| | | | | |
|---|-----------------------------------|---|---|--|
| 22 | Colonel Seydou DOUMBIA | Directeur-Général | 76 45 12 64 | doumbiaseydo2005@yahoo.fr |
| 23 | Colonel Faguimba KEITA | Directeur-Général Adjoint | 66 78 29 21 | faguimba1@yahoo.fr |
| 24 | Commandant Cheick Fouta MADY KONE | Médecin des urgences | 76 48 21 76 | cf1_kone@yahoo.fr |
| 25 | Colonel Tiécoura SAMAKÉ | Inspecteur en Chef de la Protection Civile | 76 39 32 21 | samcommandant@yahoo.fr |
| 26 | Colonel Dramane DIALLO | Sous-Directeur Etude et Prévention | 66 88 02 97 | dramanediello94@yahoo.fr |
| 27 | Colonel Mery DIAKITE | Sous-Directeur des Opérations de Secours et d'Assistance | 66 88 03 06 | merydiakite917@yahoo.fr |
| Ministère de l'Environnement, de l'Assainissement et du Développement Durable | | | | |
| 28 | Mamadou GAKOU | Secrétaire-Général | 76 46 16 45 | mgkou@yahoo.fr |
| Banque mondiale | | | | |
| 29 | Paul NOUMBA UM | Directeur des opérations | 20 70 22 17 | hmaiga@worldbank.org |
| 30 | Boubacar WALBANI | Chargé principal des opérations | 20 70 22 38 | bwalbani@worldbank.org |
| 31 | Jean-Baptiste MIGRAINE | Expert en gestion des risques de catastrophes (GRC) | +12024580093 | jmigraine@worldbank.org |
| 32 | Fatoumata DIOURTE BERTHE | Assistante d'équipe | 20 70 22 01 | fberthe@worldbank.org |
| Utilisateurs et partenaires techniques et financiers | | | | |
| 33 | Mamadou Ben Cherif DIABATÉ | Réseau des Communicateurs Traditionnels (RECOTRAD) | 79 17 84 33 | diabatecherif@yahoo.fr |
| 34 | Aminata DEMBELE FAYE | Fédération Nationale des Collectifs d'Organisations Féminines du Mali (FENACOF) | 66 78 83 37 | mdayeamyfaye@yahoo.fr |
| 35 | Alassane TRAORÉ | Union des jeunes de l'UEMOA (UJUEMOA) | 76 19 84 02 | ujuemamali@yahoo.fr |
| 36 | Alkaou KANOUTE | SECO – ONG ASSAFEDE UJUEMOA | 76 43 44 51 | Alkaou.kanoute@yahoo.fr |