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The World Bank

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Report No: PAD2016

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED CREDIT

IN THE AMOUNT OF SDR 51.6 MILLION
(US$75 MILLION EQUIVALENT)

TO THE

REPUBLIC OF MADAGASCAR

FOR THE

INTEGRATED URBAN DEVELOPMENT AND RESILIENCE PROJECT FOR GREATER ANTANANARIVO

APRIL 26, 2018

Social, Urban, Rural and Resilience Global Practice
Water Global Practice
AFRICA

CURRENCY EQUIVALENTS

(Exchange Rate Effective March 31, 2018)

Currency Unit =	Malagasy Ariary (MGA)
SDR 0.6878 =	US$1
MGA 3,224.45 =	US$1

FISCAL YEAR
January 1 - December 31

Regional Vice President: Makhtar Diop
Country Director: Mark R. Lundell
Senior Global Practice Directors: Ede Jorge Ijjasz-Vasquez, Guang Zhe Chen
Practice Managers: Bernice K. Van Bronkhorst, Catherine Tovey
Task Team Leaders: Michel Matera, Glenn Pearce-Oroz

ABBREVIATIONS AND ACRONYMS

AAL	Average Annual Losses
AFD	French Development Agency (*Agence Française de Développement*)
AGETIPA	Executing Agency for Public Interest Works (*Agence d'Exécution des Travaux d'Intérêt Public et d'Aménagement*)
APIPA	Antananarivo Flood Protection Agency (*Autorité pour la Protection contre les Inondations de la Plaine d'Antananarivo*)
BNGRC	National Disaster Risk Management Agency (*Bureau National de Gestion des Risques et des Catastrophes*)
BPPAR	National Office for Regional Development Projects (*Bureau National des Projets de Promotion de l'Aménagement des Régions*)
CAE	Administrative Evaluation Commission (*Commission Administrative d'Evaluation*)
CERC	Contingent Emergency Response Component
CESMP	Contractor Environmental and Social Management Plan
CMOD	Delegated Contract Management Agreement (*Convention de Maitrise d'Ouvrage Déléguée*)
CUA	Municipality of Antananarivo (*Commune Urbaine d'Antananarivo*)
CPF	Country Partnership Framework
CPGU	Emergency Management and Prevention Unit (*Cellule de Prévention et Gestion des Urgences*)
DALY	Disability Adjusted Life Year
DGATE	Director General for Land Use Planning and Equipment (*Direction Générale de l'Aménagement du Territoire et de l'Equipement*)
EA	Enumeration Area
EAD	Expected Annual Damage
EIB	European Investment Bank
ESMP	Environmental and Social Management Plan
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESSF	Environmental and Social Screening Form
EU	European Union
FM	Financial Management
FY	Fiscal Year
GA	Greater Antananarivo
GBD	Global Burden of Disease
GDP	Gross Domestic Product
GHI	Global Hunger Index
GOM	Government of Madagascar
GRM	Grievance Redress Mechanism

GSURR	Global Practice for Social, Urban, Rural and Resilience
HSE	Health Safety and Environment
IDA	International Development Association
IFR	Interim Financial Report
IHME	Institute for Health Metrics Evaluation
IRM	Immediate Response Mechanism
IUWM	Integrated Urban Water Management
JICA	Japan International Cooperation Agency
JIRAMA	National Water and Electricity Utility (*Jiro Sy Rano Malagasy*)
JRC	European Union's Joint Research Centre
LCS	Local Consultation Structure (*Structure Locale de Concertation*)
MFB	Ministry of Finance and Budget
MID	Ministry of the Interior and Decentralization
M2PATE	Ministry attached to the Presidency, in charge of Presidential Projects, Land Use Planning and Equipment (*Ministère rattaché auprès de la Présidence en charge des Projets présidentiels, de l'Aménagement du Territoire et de l'Equipement*)
M&E	Monitoring and Evaluation
MEEH	Ministry of Water, Energy and Hydrocarbon *(Ministère de l'Eau, de l'Energie et des Hydrocarbures)*
MOIS	Institutional and Social Project Manager (*Maitrise d'Œuvre Institutionnelle et Sociale*)
MOU	Memorandum of Understanding
NGO	Non-Governmental Organization
NPV	Net Present Value
ONE	National Office of Environment (*Office National pour l'Environnement*)
O&M	Operation and Maintenance
OPCI	Public Inter-municipal Cooperation Organization (*Organisme Public de Coopération Intercommunale*)
PAP	Project Affected People
PEBSP	Participatory Evaluations of Beneficiary Satisfaction on the Project
PEFA	Public Expenditure and Financial Accountability
PFM	Public Financial Management
PIAA	Antananarivo Integrated Sanitation Program (*Programme Intégré d'Assainissement d'Antananarivo*)
PIM	Project Implementation Manual
PMU	Project Management Unit
PPA	Project Preparation Advance
PRODUIR	Integrated Urban Development and Resilience Project (*Projet de Développement Urbain Intégré et de Résilience*)
PUDI	Urban Master Plan *(Plan d'Urbanisme Directeur)*
RAP	Resettlement Action Plan
RF2	Water, Sanitation and Hygiene Community Groups (*Rafitra Fikojàna ny*

	Rano sy Fidiovana)
RPF	Resettlement Policy Framework
SAMVA	Antananarivo Autonomous Sanitation Service (*Service Autonome de Maintenance de la Ville d'Antananarivo*)
SCD	Systematic Country Diagnostic
SEP	Stakeholder Engagement Plan
SOP	Series of Projects
STEP	Systematic Tracking of Exchanges in Procurement
TA	Technical Assistance
TOR	Terms of Reference
US$	United States Dollars
WB	World Bank

BASIC INFORMATION

Is this a regionally tagged project?	Country(ies)	Financing Instrument
No		Investment Project Financing

[ ] Situations of Urgent Need of Assistance or Capacity Constraints

[ ] Financial Intermediaries

[✓] Series of Projects

Approval Date	Closing Date	Environmental Assessment Category
17-May-2018	28-Feb-2023	A - Full Assessment

Bank/IFC Collaboration
No

Proposed Development Objective(s)

The Project Development Objective is to enhance urban living conditions and flood resilience in selected low-income neighborhoods of Greater Antananarivo; and to improve the Recipient's capacity to respond promptly and effectively to an Eligible Crisis or Emergency.

Components

Component Name	Cost (US$, millions)
Improving urban drainage, services and resilience in targeted areas	58.04
Strenghtening institutional capacity for resilient urban governance	5.46
Project Management, Coordination, Monitoring and Evaluation	6.50
Contingent Emergency Response Component (CERC)	0.00
Unallocated	5.00

Organizations

Borrower :	Ministry of Finance and Budget
Implementing Agency :	Ministry attached to the Presidency, in charge of Presidential Projects, Land Use Planning and Equip

PROJECT FINANCING DATA (US$, Millions)

[ ] Counterpart Funding	[ ] IBRD	[✓] IDA Credit	[ ] IDA Grant	[ ] Trust Funds	[ ] Parallel Financing

Total Project Cost:	Total Financing:	Financing Gap:
75.00	75.00	0.00
	Of Which Bank Financing (IBRD/IDA): 75.00	

Financing (in US$, millions)

Financing Source	Amount
IDA-62450	75.00
Total	**75.00**

Expected Disbursements (in US$, millions)

Fiscal Year	2018	2019	2020	2021	2022	2023
Annual	0.00	4.70	11.04	15.60	24.01	19.65
Cumulative	0.00	4.70	15.74	31.34	55.35	75.00

INSTITUTIONAL DATA

Practice Area (Lead)

Social, Urban, Rural and Resilience Global Practice

Contributing Practice Areas

Governance
Water

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

Gender Tag

Does the project plan to undertake any of the following?

a. Analysis to identify Project-relevant gaps between males and females, especially in light of country gaps identified through SCD and CPF

Yes

b. Specific action(s) to address the gender gaps identified in (a) and/or to improve women or men's empowerment

Yes

c. Include Indicators in results framework to monitor outcomes from actions identified in (b)

Yes

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	Substantial
2. Macroeconomic	Moderate
3. Sector Strategies and Policies	Moderate
4. Technical Design of Project or Program	Moderate
5. Institutional Capacity for Implementation and Sustainability	High
6. Fiduciary	Substantial
7. Environment and Social	High

8. Stakeholders	Substantial
9. Other	
10. Overall	Substantial

COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

[ ] Yes [✓] No

Does the project require any waivers of Bank policies?

[ ] Yes [✓] No

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	✓	
Natural Habitats OP/BP 4.04	✓	
Forests OP/BP 4.36		✓
Pest Management OP 4.09		✓
Physical Cultural Resources OP/BP 4.11	✓	
Indigenous Peoples OP/BP 4.10		✓
Involuntary Resettlement OP/BP 4.12	✓	
Safety of Dams OP/BP 4.37		✓
Projects on International Waterways OP/BP 7.50		✓
Projects in Disputed Areas OP/BP 7.60		✓

Legal Covenants

Sections and Description

Schedule 2, Section I.F.1. The Recipient shall, not later than three (3) months after the Effective Date, establish and maintain a financial management system including records, accounts and preparation of related financial statements in accordance with accounting standards acceptable to the Association.

Sections and Description

Schedule 2, Section I.F.2. The Recipient shall ensure that financial statements of the project shall be audited in

accordance with international auditing standards and that such audited financial statements for each fiscal year shall be furnished to the Association not later than six (6) months after the end of the fiscal year.

Sections and Description
Schedule 2, Section I.F.3. The Recipient shall cause the Service Provider to furnish the annual financial statements audit report to the Association not later than six (6) months after the end of the fiscal year.

Sections and Description
Schedule 2, Section I.F.4. The Recipient shall, not later than three (3) months after the Effective Date, recruit (i) a senior internal auditor and (ii) and independent external auditor, with qualifications and experience acceptable to the Association.

Sections and Description
Schedule 2, Section I.A.4(a) For purposes of verifying the number of people who would be affected by resettlement under Parts 1.1(iv) and Part 1.2 (iv) of the Project, including the amount of cash compensation and or resettlement assistance to be paid to such people, no later than three (3) months after the Effective Date, the Recipient shall hire an independent agent under terms and conditions acceptable to the Association; and immediately thereafter furnish to the Association an audited compensation statement report, acceptable to the Association.

Sections and Description
Schedule 2, Section I.A.4(b) For auditing purposes, the Recipient shall ensure that the independent agent referred to in Schedule 2, Section I.A.4 paragraph (a) of the Financing Agreement, furnishes annual financial statement audit reports of the cash compensation paid to the people who would be affected by the resettlement under Parts 1.1(iv) and Part 1.2 (iv) of the Project.

Sections and Description
Schedule 2, Section I.C.2 The Recipient shall furnish to the Association, not later than November 30 of each year, the annual work plans and budgets approved by the Project Steering Committee for the Association's review and approval; except for the annual work plan and budget for the Project for the first year of Project implementation, which shall be furnished no later than one (1) month after the Effective Date. Only the activities included in an annual work plan and budget expressly approved by the Association (each an "Annual Work Plan and Budget") are eligible to be financed from the proceeds of the Financing.

Conditions

Type	Description
Effectiveness	The PMU has been established.

Type	Description
Effectiveness	The PIM has been adopted.
Effectiveness	The Delegated Contract Management Agreement has been executed in form and substance acceptable to the Association.
Effectiveness	The existing Canal C3 ESIA and RAP have been reviewed, updated and disclosed in a manner acceptable to the Association; such update to include a specific ESIA for the sludge disposal site.
Effectiveness	The independent E&S Panel has been established with a mandate and composition acceptable to the Association.
Disbursement	No withdrawal shall be made for payments under Category 2 unless and until the sludge disposal site is operational, in accordance with the requirements of the Safeguard Documents, and acceptable to the Association.
Disbursement	No withdrawal shall be made for payments under Category 2 unless and until the resettlement sites are operational in compliance with the terms of the Safeguards Documents and acceptable to the Association.
Disbursement	No withdrawal shall be made for payments under Category 5 unless and until the Association is satisfied that the following conditions have been met, and has notified the Recipient accordingly: (i) the Recipient has determined that an Eligible Crisis or Emergency has occurred, has furnished to the Association a request to include activities in the IRM Part of the Project in order to respond to said Eligible Crisis or Emergency, and the Association has agreed with such determination, accepted said request and notified the Recipient thereof; (ii) the Recipient has prepared and disclosed all Safeguards Documents (or other required safeguard instruments) required for said activities, and the Recipient has implemented any actions required pursuant thereto, all in accordance with the provisions of Section I. E of Schedule 2 to the Financing Agreement; (iii) the Recipient has ensured that the Coordinating Authority has adequate

	staff and resources in accordance with the provisions of Section I.E.2 of Schedule 2 to the Financing Agreement, for the purposes of activities in the IRM Part of the Project; and (iv) the Recipient has maintained the IRM Operations Manual approved for the Recipient, in form and substance acceptable to the Association pursuant to Section 1.E.1 of Schedule 2 to the Financing Agreement.
Type Disbursement	Description No withdrawal shall be made for payments under Category 3 unless and until the audited compensation statement report has been furnished and deemed acceptable to the Association.

PROJECT TEAM

Bank Staff

Name	Role	Specialization	Unit
Michel Matera	Team Leader(ADM Responsible)	Urban and DRM	GSU13
Glenn Pearce-Oroz	Team Leader	Water	GWA01
Sylvain Auguste Rambeloson	Procurement Specialist(ADM Responsible)		GGOPF
Maharavo Harimandimby Ramarotahiantsoa	Financial Management Specialist		GGOAC
Andrianjaka Rado Razafimandimby	Social Safeguards Specialist	Social safeguards	GSU20
Brenden Jongman	Team Member	DRM	GFDRR
Camilla Gandini	Team Member		GSU07
Chalida Chararnsuk	Team Member		GSU13
Farouk Mollah Banna	Team Member	Solid Waste Management	GSU19
Gael Fetraniaina Raserijaona	Team Member	Urban Development	GSU13
Heriniaina Mikaela Andrianasy	Team Member	Local Governance	GGOAC
Hung Duy Le	Team Member	Infrastructure	GWA02
Paul-Jean Feno	Environmental Safeguards Specialist	Environment safeguards	GEN07

Peter F. B. A. Lafere	Social Safeguards Specialist	Social safeguards	GSU01
Salim Rouhana	Team Member	Urban Resilience	GSU19
Sung Heng C. Kok Shun	Team Member	Operational assistance	GSU19
Sylvie Debomy	Team Member	Urban	GSU19
Taibou Adamou Maiga	Team Member	Water	GWA07
Vohangitiana Josiane Rarivoson	Team Member	Operational assistance	AFMMG

Extended Team

Name	Title	Organization	Location

MADAGASCAR
INTEGRATED URBAN DEVELOPMENT AND RESILIENCE PROJECT FOR GREATER ANTANANARIVO

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I. STRATEGIC CONTEXT

A. Country Context

1. Madagascar is an island nation with unparalleled biodiversity and significant natural wealth, which serve as valuable resources for the country's economic base. Agriculture, including fishing and forestry, employs roughly 80 percent of Madagascar's work force and accounts for more than 25 percent of the country's GDP, which was estimated at US$35.49 billion in 2015.

2. However, a majority of the 23 million (2015) Malagasy are extremely poor. Extreme poverty (per capita consumption under US$1.90 2011 Purchasing Power Parity (PPP) per day) increased from 69 to 79 percent of the population between 2001 and 2012. Over the same timeframe, absolute poverty (US$3.1 PPP per capita per day) rose from an estimated 4 percent in 2001 to 90 percent in 2012. In terms of social indicators, the primary school enrollment was at 69.4 percent in 2012, and immunization coverage, a proxy indicator for the overall performance of the health system, was at 60 percent in 2013. According to the 2015 Global Hunger Index (GHI), Madagascar has an "alarming" GHI score of 36.3[1], with stunting for under-five year old children rising to close to 50 percent. These high levels of stunting are closely linked to extremely poor sanitary conditions; in 2015, only 12 percent of Malagasy had access to improved sanitation, compared to low-income countries average of 28 percent.

3. Since the country's return to constitutional order in 2014, the political context has remained challenging. Presidential elections are scheduled to take place in late 2018 and could lead to a revival of tensions. These elections present a unique opportunity for the country to have for the first time in its history since independence a Presidential term start and end with a constitutional transfer of power through elections. Many tangible advances have been achieved since 2014, including the elaboration of a new National Development Plan (2015-2019) released in April 2015. GDP growth is projected to reach 5.1 percent in 2018 and then average 5 percent over the 2019-2022 period. The intensification of public works, tourism, and energy are expected to be key growth drivers. More rigorous implementation of tax and customs regulations has led to an increase in tax revenues from 10.1 percent of GDP in 2014 to 11.7 percent in 2017, enabling the government to increase progressively social spending and public investments. These have not materialized yet into a significant reduction of poverty though.

4. Finally, due to its location, topography and socioeconomic conditions, Madagascar is also one of the world's most exposed and vulnerable countries to climate change and extreme weather events, with the most likely risks involving cyclones, flooding, and drought. A disaster risk modeling study completed at the end of 2016 shows that Madagascar faces Average Annual Losses (AAL) of US$100 million for all combined hazards (cyclone, flood and earthquake) and that every year, there is a 10 percent probability that damages will exceed US$240 million and a 5 percent probability that they will exceed US$600 million. From 1990 to 2015, at least 65 major climate-related disasters were recorded in Madagascar, with more than 50 cyclones. Greater Antananarivo (GA) was most recently hit by catastrophic flooding in January

[1] The Global Hunger Index (GHI) is a multidimensional statistical tool used to describe the state of countries' hunger situation. The Index ranks countries on a 100-point scale, with 0 being the best score (no hunger) and 100 being the worst. Values from 35.0 to 49.9 reflect alarming hunger levels.

2015, which affected an estimated 93,000 people and displacing 40,000, and had an estimated economic impact equivalent to 1.1 percent of GDP (> US$100 million). The country's resilience is constrained by the pre-existing vulnerability of the population and the weakness of the public infrastructure and services.

B. Sectoral and Institutional Context

a. Urban context

5. Madagascar and Greater Antananarivo (GA) are witnessing rapid urbanization. The country today houses more than 6.9 million people living in urban areas as compared to 2.8 million in 1993. Cities account for approximately three fourths of the national GDP, with the capital contributing 50 percent of GDP (*Defi Urbain* report). The *Commune Urbaine d'Antananarivo* (CUA) has a population of about 1.8 million (2011) and is growing exponentially[2]. UN Habitat estimates that the CUA's population is growing at a rate of 5 percent a year, driven by both population growth as well as strong rural-urban and urban-urban (secondary cities to GA) migration trends. As such, the capital city gains approximately 100,000 new inhabitants per year and has experienced a 50 percent increase in its built environment since 2003. The GA metropolitan area, encompassing the CUA and 36 additional communes, hosts nearly 3 million people. The lack of employment opportunities for the growing population has led to a concentration of poverty of more than 66 percent in GA, compared to a national urban poverty rate of about 51 percent[3].

6. The urban poor generally live in settlements that have inadequate basic services and are residing in housing that is often temporary in nature. It is estimated that about 70 percent of the CUA's settlements are informal. Slum dwellers are often unskilled laborers with extremely low revenues, whose limited economic opportunities contribute to perpetuating the degradation of their living environment. This precariousness has led to a range of additional issues, such as increasing crime and violence, which threaten citizens' security and increase negative social and economic outcomes. Overall, informal settlements disproportionately affect the poor and undermine other poverty reduction and economic development efforts.

7. Situated in the heart of the highlands of Madagascar, Antananarivo is situated on 12 laterite hills and alluvial plains drained by three rivers (Ikopa, Sisoany and Mamba). The region receives an average annual rainfall of 1300mm, of which 90 percent is concentrated in the rainy season. The older parts of the city are located on the hill tops, relatively safe from inundation. However, the growth of the city has spread to a natural floodplain creating challenges to ensuring drainage in an increasingly urbanized setting, making it particularly vulnerable to urban flooding.

8. The CUA's high exposure to flooding presents a significant threat to the high concentration of people and assets in the flood plain, especially for the poor. Competition for space makes households locate in areas that are at risk of floods but close to urban labor markets. In some municipalities of GA, up to 50 percent of the built environment is directly located in flood-prone areas (20-year return flooding). A

[2] The Commune Urbaine d'Antananarivo (CUA) is the administrative organization of the municipality of Antananarivo. The greater Antananarivo (GA) metropolitan area encompasses the CUA and 36 other communes.
[3] World Bank, 2017. Greater Antananarivo: Urban Poverty and Resilience Study.

recent survey found that among GA households reporting that they are affected by floods, 30 percent are within the lowest per capita consumption quintile. Recurring flood events have significant negative impacts on capital accumulation in these lower quintiles and may contribute to lasting poverty traps[4].

9. In addition to being highly exposed to flooding, CUA faces low access to safe water and sanitation. Only 16 percent of Madagascar's urban dwellers have access to improved sanitation, compared to a low-income country average of 39 percent. The average access to potable water in Madagascar's urban cities decreased from 63 percent in 2005 to 61 percent in 2012. Poor access to drinking water and sanitation facilities has had significant negative impacts on public health, education, poverty, nutrition as well as the environment. Diarrheal diseases are the second leading cause of death after malaria, and affect 51 percent of children under 5. Poor levels of health and sanitation gave rise to a national outbreak of bubonic and pneumonic plague in 2017, that infected over 2,000 people and killed more than 200. Contrary to previous smaller outbreaks, most cases were identified in the informal settlements of CUA and the surrounding urban areas.

b. Failing Infrastructure and Deficient Urban Services

10. Rapid urbanization is increasing the already acute pressure on a limited stock of existing infrastructure and on deficient local services. Challenges and shortcomings can be observed across a variety of sectors in the city.

11. Urban Drainage and Water Management. CUA is drained by a network of artificial drainage canals, most of which were constructed several decades ago. The rapid and largely unplanned urbanization of GA has significantly altered the natural drainage capacity of the environment. The drainage canals in their current state have a greatly reduced ability to discharge surplus water from the urban area due to their poor condition, lack of regular maintenance, and highly limited capacity throughput (with sediment and solid waste completely filling the canals in certain places or constructions, such as low bridges and buildings, covering the canals and drainage infrastructure). In addition, the elevation levels of the three main rivers in the area are at a higher elevation than the low-lying plain area. The uncontrolled pratice of backfilling low-lying areas for speculative land development exacerbates the of situation. To protect the city from riverine flooding, dikes were built along the main rivers more than 50 years ago. These dikes were designed to provide protection against floods with 20- and 50-year return periods. However, many dikes are in poor condition and dike breaches have occurred during nearly every recent flooding event.

12. The *Autorité pour la Protection contre les Inondations de la Plaine d'Antananarivo* (APIPA) is responsible for the maintenance and operational management of both the dike system and main canals and pumps of the storm water drainage system of Greater Antananarivo. APIPA also operates and maintains a Flood Early Warning System for the metropolitan area. At the same time, the *Ministère de l'Eau, de l'Energie, et des Hydrocarbures* (MEEH) oversees service provision of water supply, sanitation, and flood management for Antananarivo.

13. Solid Waste Management. Antananarivo generates approximately 1,100 tons of solid waste per day. This rate is projected to reach 1,600 tons per day by 2020 due to population increase and changes in the mode of consumption. The waste collection rate in 2016 was approximately 75 percent but projections

[4] World Bank, 2015. Shock Waves

show that this rate could drop below 50 percent by 2020 if the means of waste collection and disposal are not improved. At the neighborhood level, pre-collection arrangements that rely on fokontany (neighborhood) organizations (RF2, for example) have been set-up and are working well in some but not all CUA neighborhoods. The variance in performance depends on the different levels of engagement between CUA-arrondissement-RF2, funding and equipment, and the presence of support organizations, among others. Finally, the current dumpsite of *Andralanitra* will reach full capacity in less than four years and an alternative long-term treatment and disposal landfill site has not yet been identified. The identification and development of a new landfill site will be a time-consuming process given the land scarcity in Greater Antananarivo that will require significant institutional coordination and investment. The *Service Autonome de Maintenance de la Ville d'Antananarivo* (SAMVA) was created by the CUA as an autonomous entity to manage municipal solid waste within the CUA jurisdiction only. However, the SAMVA is critically underfunded, underequipped and unable to provide a proper service. A large portion of solid waste is thus disposed into illegal dumpsites or left in drainage channels.

14. Disaster Risk Management. The *Cellule de Prévention et Gestion des Urgences* (CPGU), a coordination unit within the Prime Minister's office, was created to provide high-level strategic advice on disaster risk management (DRM), primarily by mainstreaming disaster risk reduction into sectorial planning and programs. Its objectives are to reduce the vulnerability of the country's infrastructure and build resilience to climate hazards. The *Bureau National de Gestion des Risques et des Catastrophes* (BNGRC), under the Ministry of the Interior and Decentralization (MID), is in charge of the operational aspects involved in the management of disasters, as well as the coordination of emergency relief. Local Disaster Management Committees have also been established by municipal decree for each fokontany. However, staff turnover has been high due to ongoing changes in political landscapes.

15. Informal Settlements. The combination of rapid urbanization, high concentration of poverty, failing infrastructure, and deficient service delivery is leading to the proliferation and deterioration of informal settlements on both public and private lands, especially in unsanitary lowland areas that are highly susceptible to flooding. Today, it is estimated that about 70 percent of the CUA's settlements are informal with sub-standard housing (*Profil Urbain d'Antananarivo, UN Habitat)*. So far, there have been limited government or donor efforts targeted at improving the resilience of informal settlements.

c. Lack of Effective Metropolitan Governance and Municipal Finance

16. Several key institutions, both at central government and municipal government levels, are designed to play a role in managing the city's growth and its metropolitan area. Currently, there is little coordination between the central and local levels on issues related to metropolitan governance, shared services (flood protection, solid waste management, transport), financing, and planning. However, recent progress in inter-communal and metropolitan solutions is promising. The Integrated Urban Water Management Platform (IUWM) that has begun to operate (with the support of a Bank Technical Assistance (TA)) and an "*Agence d'Urbanisme*", supported by the French decentralized cooperation and the French Development Agency (AFD) has been launched. In addition, two key studies that have been initiated (the Urban Development Master Plan for GA financed by the Japan International Cooperation Agency (JICA) and the Integrated Sanitation and Drainage Master Plan for Antananarivo financed by the AFD) all point to a convergence of stakeholder opinions that a broader approach is needed to improve urban management.

A key challenge of this metropolitan framework will be the low capacity of local governments, as well as the coordination between local governments and national ministries that currently implement urban projects and provide municipal services (storm water drainage and solid waste management).

17. The *Ministère rattaché auprès de la Présidence en charge des Projets présidentiels, de l'Aménagement du Territoire et de l'Equipement* (M2PATE) has a central role related to implementing policies connected to urban development, as well as a cross-cutting function designed to coordinate the implementation of relevant urban infrastructure interventions across all departments. At the same time, the municipality, CUA, retains a special status as the capital of Madagascar (Act N° 2015-011). Its powers and responsibilities mostly cover the challenges and needs related to social issues, roads, water, sanitation, hygiene, waste management, and municipal land management, amongst others. The *Agence d'Exécution des Travaux d'Intérêt Public et d'Aménagement* (AGETIPA) was created in 1993 to help execute infrastructure projects across a variety of departments. M2PATE handles technical oversight for both the CUA and AGETIPA. In practice, the numerous institutions and government agencies that provide services and are in charge of planning and enforcing urbanization norms have not been effectively coordinating across their areas of responsibility.

18. Municipal Finance. Communes currently have a limited ability to raise taxes and, therefore, to sustain urban investments. The CUA has an annual budget of 35 billion Ariary (about US$11.13 million), of which only 18 billion Ariary (about US$5.72 million) are executed due to non-realized fiscal revenue and government transfers. Among the roughly 400,000 properties within the vicinities of CUA, only 25 percent are formally registered and thus the remainder falls outside of the taxation system. Among those, only about 20 percent pay taxes, which severely limits CUA's budget and illustrate its weak revenue generation capacity. Hence between 2007 and 2013, the CUA collected a mere 15 to 23 billion Ariary annually (about US$4.77 to US$7.31 million). The commune has roughly 3,500 employees, whose salaries take up to 83 percent of its executed budget and thus limit its investment capacity. Critical challenges include: (i) limited revenue streams and weak budget management leading to poor service-delivery and undermining public investment management efficiency; (ii) limited transparency and accountability of local governments dis-incentivizing citizens and private sector to pay their taxes; and (iii) political-economy constraints and institutional challenges undermining the efficiency of reforms.

19. Urban Land Management. GA suffers from a poorly functioning land market and deficient land management practices. Those range from (i) outdated and inadequate land policies; (ii) unenforced land use and zoning codes that have been formally adopted; (iii) poorly functioning and incomplete urban land registries that affects the land taxation system; (iv) a lack of adequate planning tools to operationalize broader planning guidelines; and (v) weak knowledge of the inventory public assets and their best utilization. Coupled with an absence of an inclusive housing policy, these factors have led to a massive proliferation of slums on public and private lands with high concentrations in flood-prone areas.

20. World Bank Engagement in Urban Development and Water Sector in Madagascar. The World Bank has not been involved in urban development and the water sector in Madagascar for over a decade. The catastrophic flooding of January 2015 illustrated the consequences of dysfunctional urban systems and the inability of multiple agencies and levels of government to coordinate on strategic urban management, infrastructure maintenance, and service provision. At the request of the Government of Madagascar, the

Bank engaged in some key TA[5] by both the Social, Urban, Rural and Resilience (SURR) and Water GPs to better understand urban poverty and opportunities for more integrated urban water management of the urban water cycle in GA.

C. Higher Level Objectives to which the Project Contributes

21. Madagascar's Systematic Country Diagnostic (SCD) recommends making the protection of the poor against natural disaster-related shocks and increasing investment to improve access to drinking water and sanitation facilities key national priorities. With an estimated 4 million people currently living in zones at high risk of cyclones or floods, the SCD highlights that Madagascar is one of the most climate vulnerable countries in the world and that the poor are the most impacted by natural hazards. The SCD further points out that Madagascar's poor access to drinking water and sanitation facilities has a profoundly negative impact on poverty, as well as public health, education, and the environment. With low labor productivity, diarrheal diseases, and malnutrition exemplifying current problems, the country's long-term development will depend on its ability to invest in higher human capital. Flooding may also further exacerbate water-quality diseases by increasing surface water pollution.

22. The new Country Partnership Framework (CPF) for Madagascar for the period FY17-21, which was approved in May 2017 and is aligned with the World Bank Group's twin goals of eliminating extreme poverty and promoting shared prosperity, has two focus areas: (i) Increasing resilience and reducing fragility, and (ii) Promoting inclusive growth. It recognizes urban poverty as a long-term development challenge and a potential source of fragility, particularly in the capital city. Under the first focus area, the project will directly support objective 2 "Enhanced resilience of livelihoods of vulnerable households in rural and urban areas" by improving urban services and reducing disaster risks in poor neighborhoods of Greater Antananarivo.

23. The proposed project is consistent with the Government's Five-Year National Development Plan (PND) and specifically its strategic areas 1, 4 and 5 whose objectives are respectively to (i) build sound public institutions both at central and decentralized levels, (ii) improve access to better services; and (iii) reinforce the resilience of the Malagasy economy and communities. It is also aligned with the upcoming National Urban Development Policy which highlights the need for resilient, inclusive and sustainable cities. This policy highlights the need to accompany a rapid urban transition through the development of new infrastructure and by improving the living environment of city dwellers. Finally, the policy promotes a more integrated approach, multi-sectoral and multi-stakeholder actions to urban development.

D. Programmatic Approach

24. The overall design of the project would represent the first phase of a Series of Projects (SoP) under a long-term programmatic approach to help improve integrated urban development and resilience for GA. Considering the depth and scale of the challenges at hand (both in terms of corrective and preventive

[5] Urban Poverty and Resilience Study in Antananarivo (P156547); Fostering Integrated Urban Water Management of Greater Antananarivo (P157539).

measures that must be undertaken) as well as the World Bank's renewed involvement in the urban and water sectors, limiting the World Bank's intervention to this project alone will not be sufficient. The SoP will significantly improve current conditions for urban dwellers, as well as put in place the much needed physical and institutional structures required for sustainable urban growth in the long run. Moreover, it will support implementation of urban development tools required to inform key structural investments (such as the Integrated Sanitation Master Plan and the Greater Antananarivo Urban Master Plan currently under development).

25. Within this context, this project serves as "project one" to help address immediate needs and lay the foundation for future investments. Using a two-pronged approach, the project design will focus on: (i) targeting critical drainage/flood protection improvements and selected neighborhoods that are highly prone to flooding for upgrading basic services and flood resilience; and (ii) initiating key activities that would help the institutions tackle systemic issues of integrated urban development at the metropolitan level. It will thereby finance both corrective (rehabilitation of drainage/flood assets and remedial interventions of neighborhood infrastructure and urban upgrading/improved service delivery for existing low-income and highly vulnerable neighborhoods) and preventive actions (covering urban management processes, including planning, strategy, inter-communal and multi-stakeholder coordination, and municipal finance) at both the neighborhood and GA levels. The project will also help improve institutional arrangements (including potential reforms for solid waste management systems, storm water drainage, and flood protection) and capacities for service delivery at a metropolitan level. Aiming at ensuring that all stakeholders, including local communities, play an active role in the design and realization of their urban spaces, it would also seek to enhance citizen engagement across all project activities to support social accountability mechanisms.

26. Overall, a phased-approach instead of a stand-alone project will allow the Bank to have a more significant impact on the country's urban development and sustain the required institutional reforms. This project helps lay the groundwork for future investments by: (i) improving institutional arrangements; (ii) improving the financial efficiency of local governments to ensure service delivery and the sustainability of infrastructures; (iii) developing detailed studies for large-scale interventions across priority areas, such as solid waste and flood management; (iv) establishing a strong rapport with other development partners to gauge the possibility of co-financing larger investments; (v) supporting the different stakeholders in the conception of their urban development vision; (vi) promoting engagement of citizens in the conceptualizing, creation and maintenance of their urban spaces; (vii) developing behavior changes processes among different stakeholders; and (viii) laying the foundation for more resilient and participant communities.

27. **Program-level PDO: the Program Development Objective is to improve services delivery and climate resilience for the urban poor of Greater Antananarivo.**

28. Project one: Project one will provide the key building blocks for more resilient urban management of Greater Antananarivo by focusing on one of the more perennially flooded areas of the city to strengthen the resilience of key urban infrastructure and at-risk human settlements. This will include urban improvements in low-lying neighborhoods, as well as improvements in access to and integration of the formal urban environment (better roads, access ways, public spaces, street lighting, sanitation and water supply); and major rehabilitation works of the C3 Canal and riverine flood protection. Identification

of key institutional reforms of municipalities (communes) and central government agencies will be undertaken and capacity-building will begin and be focused on the improved urban management of the selected area in particular. Preliminary studies for a solid waste management master plan will be undertaken during project one in order for works to be financed under the subsequent project.

29. Project two: Project two will be triggered by the completion of pending master plans and the government's commitment to make progress on options for a new sanitary landfill. Project two will consolidate the resilience gains in project one, and build resilience of new infrastructure works that are guided by the *Plan d'Urbanisme Directeur* (PUDi), the *Schema Directeur d'Assainissement* (Sanitation Master Plan approved during project one) and the solid waste management plan. Project two key investments will also continue with the integration of at-risk neighborhoods to the formal urban environment in two or three additional geographic areas, as well as large structural works (related to flood management, sanitation and drainage, solid waste, urban transportation) that help shape the sustainable urban development of the agglomeration.

II. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

The Project Development Objective is to enhance urban living conditions and flood resilience in selected low-income neighborhoods of Greater Antananarivo; and to improve the Recipient's capacity to respond promptly and effectively to an Eligible Crisis or Emergency.

B. Project Beneficiaries

30. Direct beneficiaries are expected to include 650,000 people living in the low-income neighborhoods targeted by the project, within the first and fourth arrondissements of the CUA and the peri-urban communes of Anosizato Andrefana and Bemasoandro Itaosy (see map in annex 5). They will benefit from improved drainage, sanitation, and road infrastructure. In addition, it is estimated that 2 million people will benefit indirectly from flood protection investments and citywide infrastructure improvements.

C. PDO-Level Results Indicators

31. The PDO-level indicators for the proposed project include the following:

- People provided with improved urban living conditions (number), of which female beneficiaries (number)
- People protected by restored or improved flood protection infrastructure (number)
- Share of direct project beneficiaries that are satisfied with the project interventions (percent)

32. **Intermediate results indicators** will measure more specifically (i) improved sanitation in target

neighborhoods; (ii) rehabilitated canals and embankments; (iii) detailed urban plan completed in a 2-year timeframe; (iv) revenue enhancement strategy and action plan for CUA completed; (v) project complaints effectively addressed; (vi) roads constructed or rehabilitated; (vii) pedestrian paths constructed or rehabilitated; (viii) increase of properties for which owners have been identified for tax purposes; (ix) amount of sludge dredged from the C3 and safely disposed; (x) neighborhoods (*Fokontany*) which have prepared and tested a contingency plan and evacuation strategy; (xi) person-days of temporary jobs created; (xii) Increase of water and sanitation community groups (RF2) operational within the project area; (xiii) Solid Waste Management Strategy approved.

III. PROJECT DESCRIPTION

34. A joint preliminary assessment by the World Bank and M2PATE teams has identified multiple and interconnected factors contributing to the growing challenge Antananarivo has with its exposure to urban flooding. The assessment identified several issues contributing to flood risk in Antananarivo. Out of these, five will be addressed under this project: (i) deficient city drainage system; (ii) lack of proper solid waste management (SWM); (iii) weak management of flood control assets; (iv) deficient land use planning and policies; and (v) weak urban governance at national and local levels. Given the limited project funds and weak absorptive capacity by the CUA, service delivery agencies, and the Government of Madagascar, the above issues were prioritized.

35. The proposed project aims at developing a long-term resilience framework by focusing on the critical pillars of resilience identified for Antananarivo, focusing on Drainage and Flood Risk Management, Urban Upgrading and Improving Social Resilience via improved access to basic services, and building institutions via tackling planning, governance, financial and human resources management among others. Due to its framework approach, the project will have the opportunity to benefit from enough flexibility in the project design to make changes based on learning. More specifically, this project's framework design ensures:

36. *Learning from the master planning exercises and initial project investments.* The development of the Greater Antananarivo Urban Master Plan and Integrated Sanitation Master Plan financed by JICA and AFD respectively (to be completed in 2018), together with the Detailed Urban Plan (DUP) included under this project, are configured as part of project implementation rather than project preparation. These plans provide a timely opportunity to engage with various levels of government and communities to shape their long-term urban development and resilience framework that address the multi-sectoral nature of resilience. Such a framework will also provide guidance to GoM and GA municipal authorities on means to phase capital investments in tandem with government efforts to increase revenues.

37. *Improved cost-effective investments in flood risk management and urban upgrading.* The adoption of a framework design approach for this project effectively sets the "rules of the game" and allows infrastructure investments and urban upgrading interventions to be selected on a dynamic basis. During the project, it is expected that the Integrated Sanitation Master Plan, the Detailed Urban Plan, and the GA Land Use Master Plan will be adopted by the Government. The studies will provide more clarity on the future land use and urban development plans for the target area, as well as the range of structural and non-structural measures that can be implemented in a cost-effective manner. Their adoption will signal multi-stakeholder buy-in of different government bodies and communities.

38. The proposed project aims at targeting the poor and most vulnerable. To ensure that targeted interventions contribute to lessons learned in a cross-thematic manner, it was agreed to focus on a target area, prioritizing vulnerable populations, based on several criteria namely: (i) poverty concentration; (ii) urban density; (iii) highest exposure to floods; and (iv) insertion in the 2004 physical masterplan as priority intervention area. The selected target area is defined in Annex 5. Apart from Non-Governmental Organization (NGO) interventions, this target area has never benefited from previous donor support, as it was considered too complex to intervene. Despite this complexity, the Government and the Bank have made a strategic choice to prioritize interventions in this area based on the intention of making this a transformative project that goes beyond the replication of individual urban upgrading efforts in areas not prone to flooding. The Government recognizes the Bank's added value in bringing a multi-sector approach to address these complex development challenges. Once completed, this project has the potential of making a dramatic change in the lives of thousands of urban dwellers.

39. Climate Change Co-Benefits. The World Bank Climate and Disaster Risk screening tool was used to complete climate screening. As large parts of Greater Antananarivo are located in a flood plain, extreme precipitation and flooding was identified as the primary hazard that climate change poses to investments under this project. Adaptation measures incorporated into the project design include: (i) increasing the drainage and pumping capacity of the canal C3 while protecting water retention basin from future encroachments; (ii) improving emergency evacuation roads/paths and creating evacuation spaces as part of the urban upgrading sub-component; and (iii) preparing communities for emergency response. The Greater Antananarivo Integrated Urban Development and Resilience Project will contribute significantly to climate change adaptation, with climate adaptation co-benefits estimated at 80 percent[6].

A. Project Components

40. The project consists of four main components: (i) Improving urban drainage, services and resilience in targeted areas; (ii) Strenghtening institutional capacity for resilient urban governance; (iii) Project Management, Coordination, Monitoring and Evaluation; and (iv) Contingent Emergency Response Component.

Component 1 - Improving urban drainage, services and resilience in targeted areas SDR 39.9 million (US$58 million equivalent)

41. This component, via its integrated design, aims to invest in resilience building in selected target areas of Greater Antananarivo. More specifically, this component will invest in both (i) flood and drainage risk reduction, (ii) urban upgrading and integration of vulnerable neighborhoods into the urban fabric, while ensuring (iii) effective and inclusive citizen engagement in diverse processes of design and implementation.

42. The target area where both flood protection/drainage improvements and urban upgrading

[6] Of the US$75 million, US$36 million will finance the rehabilitation of the storm water drainage system and flood protection infrastructure (100 percent adaptation co-benefits); another US$20 million will finance neighborhood upgrading interventions with a clear focus on resilience (50 percent adaptation co-benefits); US$5 million will finance resettlement/compensation costs (100 percent adaptation co-benefits); and finally, US$6 million will go to resilient urban governance (50 percent adaptation co-benefits).

interventions will be focused were selected in an inclusive manner to ensure a focus on both exposure to flood risks, that are expected to increase in intensity with climate change, and poverty. This target area, which covers parts of the first and fourth "arrondissements" of the CUA, as well as the extension to three neighboring communes (Bemasoandro, Andranonahoarta, Anosizato Andrefana), consist of the most vulnerable areas to flooding based on most recent flood modeling. Furthermore, based on diverse poverty assessments, field visits, and NGO consultations, they are considered to be the neighborhoods with the highest levels of poverty in the city. Finally, the target area includes a strong combination of high-density areas, and fast growing urban spaces.

43. **Sub-component 1.1: Improvements of Canal, Drainage and Sanitation Infrastructure (US$36.6 million).** The objective of this sub-component is to ensure flood risk mitigation through structural measures by financing public infrastructure investments for flood mitigation and drainage improvements. This component consists of no-regret priority engineering solutions identified by the Government including improvements of the C3 Canal and its associated flood retention ponds, as well as rehabilitation works on selected riverine flood protection infrastructure along the Ikopa and Sisaony Rivers. As one of the three major storm water drainage canals that helps remove storm waters from the urban plains of Antananarivo, the 12-km C3 Canal is a vital part of the drainage infrastructure. It originates at Anosibe flood retention pond and traverses through a variety of urban settlement patterns (including urban agriculture land) before draining into the Mamba River by a major pumping station. Two retention ponds (Anosibe and Andavamamba) form part of this drainage system that is currently managed by APIPA. Eligible improvement works will include cleaning and dredging of the C3 Canal and retention ponds; removal of hyacinth overgrowth in the retention ponds; removal and safe disposal of accumulated sludge; improvement of water flows and hydrological performance; improvement and construction of embankments and retention walls; construction of access ways to facilitate maintenance; improvement of inflows by tributary canals that drain into the C3; rehabilitation of the pumping station and related works; and construction of a dedicated sludge disposal site. The preliminary design estimates the costs for rehabilitating the entire Canal C3 and dikes at about US$14 million. The cost estimate for the sludge disposal site, pumping station and associated works is not yet completed and will depend on the technical design options currently being identified. Single or multiple bid packages will also be defined once the technical designs and costs are completed.

44. In addition to the works, this component will finance consulting services for the preparation of the engineering designs, bidding documents and relevant safeguards instruments, as well as works and safeguards supervision costs.

45. *Resettlement costs.* Because of the uncontrolled occupation of urban land along certain portions of the C3 Canal, involuntary resettlement will take place only in certain areas. Because of the dynamic land market, albeit informal, the bulk of the permanent resettlement is expected to be absorbed by the local rental market and little need for land acquisition should be required. However, M2PATE has identified three resettlement sites in Andavamamba, Soavimasoandro and Anosiala. The Resettlement Action Plan (RAP) indicates that 429 housing structures, of which 94 structures less than 5 square meters, corresponding to 583 households (since more than one household inhabits housing structures in several cases) and small businesses will be affected by this sub-component by both temporary and permanent resettlement. A socio-economic survey of an estimated 2,000 households has been conducted for a better understanding of the socio-economic characteristics of the affected areas. In addition, the Resettlement Policy Framework (RPF) estimates that an additional 600 people could be affected by the rehabilitation/construction of the pumping station and associated works.

46. Based on the census conducted by the Resettlement Action Plan and estimates from the RPF, the total number of project affected persons (PAPs) under this sub-component will be 3,031, of which 2,111 will be affected by Canal C3 rehabilitation and 920 by the works for the pumping station and associated infrastructure, as well as the sludge disposal site and resettlement sites. Given prior compensation costs associated with previous projects implemented in the country, the costs for resettlement are estimated to be around US$7.6 million. This cost includes the preparation and construction of three resettlement sites. Because of the weak budgetary position of government and the importance of not letting resettlement costs impede the progress of this project, approval for using IDA resources to finance cash compensation options, up to US$5.93 million, has been requested and obtained.

47. **Sub-component 1.2: Neighborhood upgrading (US$20.1 million).** This subcomponent will finance key urban infrastructure in the target intervention area. Those interventions will be planned and executed in tandem with drainage investments in sub-component 1.1. While the detailed nature of investments will be identified based on an inclusive process, and on the participatory preparation of the Detailed Urban Plan for the intervention area, they will aim at improving (i) mobility and accessibility; (ii) access to basic sanitation services; (iii) public and recreational spaces; and (iv) building resilience.

48. To ensure rapid buy-in in the target area while building innovative and more sustainable long-term solutions, this sub-component will merge two upgrading approaches that are complementary in nature:

a. No-regret urban upgrading: this first activity aims at identifying and implementing quick-win interventions that will be the first step in improving the quality of, and access to, basic urban services.

b. Structural urban upgrading: This activity seeks to lay the foundation for a novel and more durable modality for urban upgrading and integration, based on a comprehensive urban study covering the aspects of long-term urban integration and upgrading needs. This activity will build on and benefit from the social and community engagement during the preparation and execution of the above quick-win interventions. This activity builds on a wealth of World Bank international experience in urban upgrading.

49. Activities under this sub-component will help boost local job creation within selected neighborhoods, which will help build increased project ownership and engagement among local communities. AGETIPA, the delegated contract manager, has extensive experience in labor intensive

construction techniques. For instance, roads upgrading creates 15 times more man-day labor effort than asphalt roads. This will also ensure mobilization and engagement of local neighborhood labor, and keep maintenance costs lower, since capital-intensive equipment and inputs will not be needed. The residents and workers of the pilot areas will be consulted throughout the planning and implementing processes to ensure that the interventions serve the neighborhood's actual needs and support identified improvement opportunities. Specific attention will be devoted to the female population to ensure that their needs are fully integrated in the component's conception and implementation. These consultations will build on the outcomes of gender-sensitive consultations, which were carried out during project preparation.

50. In addition to the infrastructure and service delivery works, this sub-component will finance consultant services for the preparation of the target area's Detailed Urban Plan, all relevant engineering designs and supervision efforts, social analysis, behavioral audit, stakeholders' mapping and engagement plan and safeguards related instruments.

51. *Resettlement costs.* Further, this component will finance resettlement and compensation costs related to the impact of above-mentioned works. While the exact dimension of PAPs for this component are still unknown, resettlement might be expected if any major works are recommended, such as widening of roads, increased number of access ways to link marginalized neighborhoods with the rest of the urban fabric. The RPF has identified that approximately 660 people could be affected by the works, corresponding to resettlement costs estimated at US$1.2 million.

52. **Sub-component 1.3: Citizen Engagement (US$1.3 million).** The sub-component will support a system of sustainable citizen engagement to contribute both to the sustainability of infrastructure and investments in the project's pilot intervention area and to strengthen citizen participation. Activities will consist of (i) technical assistance to support the establishment of Local Consultation Structures (LCS) for promoting inclusive participation of all local stakeholders, including authorities, citizens and communities, private sector; and (ii) the development of a Stakeholder Engagement Plan (SEP) to ensure the participation and the commitment of all stakeholders of the project; (iii) the development and the implementation of the Grievance Redress Mechanism (GRM) of the project; (iv) to conduct bi-annual beneficiaries feedback survey and public disseminations activities of the project; and (v) capacity building of local communities mainly to reinforce the communities' preparedness and ability to deal with possible natural hazards.

Component 2 - Strenghtening institutional capacity for resilient urban governance SDR 3.8 million (US$5.4 million equivalent)

53. In an effort to ensure the sustainability and scalability of interventions under this project, this component would seek to build the capacity of local authorities – the CUA and a selection among the other 36 communes that make up GA – to improve inter-communal governance, municipal finance, planning, and collaboration at both municipal and metropolitan levels. The objective is to institute an integrated approach to municipal governance and urban development to better manage existing settlements and urban growth.

54. **Sub-component 2.1: Strengthening capacity for inclusive and resilient urban management (US$1.5 million)**. One of the main drivers to slum proliferation in Greater Antananarivo and in Madagascar in general is the deficient and outdated land and housing policies and instruments. To curb that trend, a better understanding of the reality of informal settlements will be needed, in addition to the development of novel policy instruments. This sub-component aims at:

i. Supporting M2PATE, CUA and targeted municipalities to internalize the recommendations of the Detailed Urban Plan (prepared under Sub-component 1.2), and the GA Urban Master Plan prepared by JICA, via developing a monitoring and evaluation instrument for urban growth, and a training and capacity building program that includes capacity building on managing land acquisition and involuntary resettlement in urban areas.

ii. Prepare an integrated slum upgrading strategy and affordable housing strategy for Greater Antananarivo. This strategy, to be led by M2PATE, will aim at reviewing diverse urban upgrading practices, and explore modalities to institutionalize some of them. It will be directly linked and build on the macro recommendations of the urban masterplan.

55. **Sub-component 2.2: Municipal management (US$2.1 million)**. This sub-component would seek to begin to modernize public sector management of the CUA by supporting reforms that aim to (i) increase local revenue mobilization while promoting transparency and accountability and oversight mechanisms; and (ii) improve human resources processes and systems.

56. **Sub-component 2.3: Capacity enhancement and sector reforms for environmental sanitation (US$1.8 million)**. The activities under this sub-component aim to improve financing mechanisms for better storm water drainage and flood protection service delivery, establish clearer responsibilities of the key agencies in managing and operating the city flood control and drainage systems; and enhance the capacity of the SAMVA to provide a reliable solid waste management, through: (i) carrying out of the APIPA study and the canal-dike maintenance plan; (ii) technical assistance for primary solid waste collection and coordination with SAMVA; (iii) elaboration and adoption of a solid waste management system and strategy; (iv) technical assistance to the IUWM Platform for APIPA and SAMVA reforms to strengthen each agency's capacity and streamline their roles and responsibilities; and (v) support of sector reforms identified by the IUWM Platform.

Component 3 - Project Management, Coordination, Monitoring and Evaluation SDR 4.5 million (US$6.5 million equivalent)

57. This component will finance the following activities: (i) incremental operating costs (including delegated contract management costs); (ii) fiduciary activities; (iii) audit, studies and assessments required under various project components; (iv) communication; and (v) monitoring (including of safeguards processes) and evaluation.

Component 4 - Contingent Emergency Response Component - CERC (US$0 million)

58. This component will provide immediate response to an Eligible Crisis or Emergency, as needed. This would finance emergency works in the case of another disaster event by including a "zero-dollar" Contingency Emergency Response Component (CERC). This would help recover damage to infrastructure, ensure business continuity, and enable early rehabilitation. In parallel, following an adverse event that causes a major disaster, the Government of Madagascar may request the Bank to channel resources from this component into an Immediate Response Mechanism (IRM). The IRM would enable the use of up to 5 percent of uncommitted funds from the overall IDA portfolio to respond to emergencies. This IRM has already been established for Madagascar and is now operational. Specific details around this component (including activation criteria, eligible expenditures, and specific implementation arrangements as well as required staffing for the Coordinating Authority) are defined in greater detail in the IRM Operations Manual

approved in April 2017.

B. Project Cost and Financing

59. Lending instrument: the proposed lending instrument is a standard Investment Project Financing (IPF) operation comprising an International Development Association (IDA) Credit of SDR 51.6 million (US$75 million equivalent), to be implemented over five years starting in 2018.

Project Components	Project cost	IBRD or IDA Financing	Trust Funds	Counterpart Funding
1 - Improving urban environment, services and resilience in targeted areas	58.04	58.04	0.00	0.00
2 - Strenghtening institutional capacity for resilient urban governance	5.46	5.46	0.00	0.00
3 – Project Management, Coordination, Monitoring and Evaluation	6.50	6.50	0.00	0.00
4 – Contingent Emergency Response Component (CERC)	0.00	0.00	0.00	0.00
Unallocated	5.00	5.00		
Total Costs				
Total Project Costs	75.00	75.00	0.00	0.00
Front End Fees				
Total Financing Required	75.00	75.00	0.00	0.00

C. Lessons Learned and Reflected in the Project Design

60. Complex urban projects with significant environmental sanitation components in densely populated slum areas have been financed by the Bank in other countries such as Vietnam, Argentina, Brazil, and Philippines. Important lessons from these operations have helped to guide the design of the Integrated Urban Development and Resilience Project (PRODUIR), most notably in terms of the sequencing of components and on targeting the geographic focus of works. In these types of projects, the challenges will always expand beyond the efforts of one single operation or one set of infrastructure works. Longer term development objectives need to be considered. The preparation of PRODUIR as a Series of Projects fits

with these lessons and the focus on both the drainage works as well as the urban integration approach under one operation will enable for greater synergy of long term urban development efforts.

61. Developing a more comprehensive and inclusive approach to urban upgrading. Based on lessons learned from other donors' urban upgrading intervention in Madagascar, limiting interventions to only basic services provision in a fragmented manner tends to impact negatively on sustainability and community inclusion. Evaluations of recent urban upgrading projects have found higher quality and better maintenance of built infrastructure where community involvement in sub-project identification, prioritization, design and implementation is strong. Lessons learned from the Madagascar Urban Infrastructure Project, which closed in 2005, highlight the importance of prioritizing investment and sub-project selection for municipalities and neighborhoods with strong community involvement.

62. Designing an integrated Urban Resilience Program with both complementary interventions on flood risk management and urban upgrading brings additional value added and impact. Based on a review of many projects funded by the World Bank, AFD, and other donors, the silo approach to dealing with drainage and urban upgrading separately showcased a major missed opportunity for cross fertilization and enhanced impact. This project builds on those lessons learned, and aims, via focusing on a pilot intervention area for both types of intervention, to create maximum synergies and positive externalities of both. As Bank experience indicates on similar projects, these are the complex urban challenges where clients value the Bank's value added.

63. Finding the right balance between in situ upgrading vs. redevelopment and resettlement. In situ upgrading helps minimize resettlement as well as social disruption and simplifies project implementation. Minimized resettlement leads to lower project costs for land acquisition and supports the social capital of the existing community. Examples from recently closed successful urban upgrading projects in Vietnam and Indonesia also show that resettlement and land acquisition are two leading causes of implementation delays. As the World Bank re-engages in the urban sector in Madagascar, in situ upgrading will therefore help mitigate this risk to project implementation.

64. Integrating a gender-lens in interventions' development to attain better project results. Women and men, girls and boys cover different roles and identities in a given society. These gender-based identities define women and men's different needs, desires and experiences, including the way they perceive the space they live in and how it can be utilized. This implies that gender considerations must be taken into account when designing any urban development intervention during design and implementation. Urban development operations can also be a great opportunity to respond to gender-based inequalities through specific measures, such as considering women and girls' safety concerns, providing female employment opportunities and securing equal land rights for women.

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

65. **Project Steering Committee.** A Project Steering Committee (PSC) was established on August 18, 2017 to provide strategic oversight of the project. The PSC is chaired by the Director General of Land Use Planning and Equipment (DGATE) and includes representatives of the Ministries of Finance and Budget, Agriculture, Interior and Decentralization, Water- Energy-Hydrocarbons, Population, Social Protection and Women; Commune Urbaine of Antananarivo, Communes of Bemasoandro, Anosizato, and Andranonahoatra; APIPA, SAMVA, BPPAR, AGETIPA, District and ONE. The PSC will meet at least twice a year and will be responsible for approving the annual work plans and related budgets, project progress reports and providing policy direction. The Project Management Unit (PMU) will act as the Secretariat of the Project Steering Committee and will be responsible for preparing the meetings, preparing the documents for the meetings, and recording the minutes of the meetings.

66. **Project Management Unit.** The PMU will be based within the Ministry attached to the Presidency, in charge of Presidential Projects, Land Use Planning and Equipment (M2PATE) and will be responsible for the day-to-day management of the project. M2PATE would be in charge of: (i) executing the project; (ii) managing technical inputs from different line ministries (i.e. MEEH), municipalities and relevant technical agencies (especially APIPA and SAMVA); (iii) endorsing consolidated technical and financial project reports from the implementing entity for onward transmission to the Bank; (iv) ensuring dissemination of lessons learned from the project to all participating agencies, beneficiary communities and other stakeholder institutions, as well as managing the overall project communications and citizen engagement strategy; and (v) ensuring the proper implementation of safeguards requirements. The PMU will be composed by (i) a coordinator; (ii) an accountant; (iii) a financial management specialist; (iv) a procurement specialist; (v) a full-time environmental safeguards specialist; (vi) a full-time social safeguards specialist; and (vii) a monitoring and evaluation specialist.

67. **Delegated Contract Management.** M2PATE will sign a Delegated Contract Management (DCM) Agreement with the *Agence d'Exécution des Travaux d'Intérêt Public et d'Aménagement* (AGETIPA) for managing the execution of components 1.1 and 1.2 of the Project. AGETIPA is a public works contract management agency with a long experience with urban infrastructure projects. AGETIPA will be responsible for: (i) selecting and recruiting consultants in charge of technical studies, detailed design and preparation of bidding documents; (ii) supervising the quality of studies and bidding documents; (iii) managing the bidding process and awarding and contracts for consultants, works and goods; (iv) managing contracts and approving invoices; (v) receiving works; and (vi) ensuring the proper implementation of safeguards requirements. The execution and delivery of this DCM Agreement will be an effectiveness condition for components 1.1 and 1.2 of the project.

68. The project will also engage in capacity building for the CUA by working with the municipality to implement recommendations from the PEFA Action Plan. A small Project Implementation Unit will be established within CUA to support the implementation of the TA activities under Component 2 and support the involvement of CUA in overall project implementation. This PIU will not have any fiduciary role. In addition, Memoranda of Understanding (MOUs) will be signed between the PMU and other institutions (i.e. APIPA, SAMVA) which will benefit from the technical assistance component.

69. **Project Implementation Readiness.** A Project Preparation Advance (PPA) in the amount of US$2 million was used to carry out project preparation activities. Feasibility studies, detailed designs and safeguards documents have been developed for the proposed priority drainage and flood protection works (estimated cost of US$14 million); corresponding bidding documents are expected to be finalized by project effectiveness. The total estimated cost of works that can commence during the first year of project effectiveness, including safeguards measures, is US$15 - 20 million.

B. Results Monitoring and Evaluation

70. **The Project Management Unit (PMU) will oversee the monitoring and evaluation (M&E) aspects related to the project.** AGETIPA will support the PMU on M&E for the entire duration of project implementation and will work closely with PMU staff on updating project indicators. The results framework described in Annex 1 provides the key indicators, targets, and data collection arrangements. The project will use a web-enabled management information system to manage information and report progress. The database will be available on an open-access basis, to support greater transparency, collaboration and improved project governance.

71. **Social and Environmental Monitoring will include:** (i) monitoring compliance with the Malagasy national environmental regulations; social and environmental safeguards policies and environmental and social assessment provisions; and (ii) overall monitoring and oversight of social and environmental issues at project levels. Specific attention will be devoted to monitoring and evaluating the project's gender aspects.

72. **Regular Quality Supervision and Certification:** this will be carried out by the PMU. Detailed quality guidelines will be developed by the PMU and adopted by all implementing units during project implementation.

73. **Physical Progress Monitoring and Audits** - Physical progress monitoring will be carried out monthly by AGETIPA and reported to the PMU which, in turn, will share the reports on a quarterly basis with the World Bank. Financial progress will be reported through the quarterly Interim Financial Reports (IFRs).

74. A baseline survey will be prepared as part of the design of Sub-Component 1.2. The data are disaggregated by gender, age cohort, and income levels to better determine the impact of the distribution of benefits on community members throughout the project lifecycle. A mid-term review (MTR) report of the project will be prepared and provided to the Bank before December 31, 2020, and an Implementation Completion Report (ICR) upon project completion.

C. Sustainability

75. ***Overall sustainability*:** Project sustainability relies on the full commitment of the Government in coordinating and providing guidance and ownership of all aspects of project strategy and design, including the drainage and sanitation masterplan funded through AFD, the Urban Masterplan funded by JICA, and the Detailed Urban Plan (DUP) funded under the project. These planning instruments, combined with other institutional support and TA planned under this project, are intended to ensure a platform for policy and institutional reforms discussions related to flood management and inclusive urban development.

76. ***Ownership:*** The M2PATE, via the DGATE, has the overall responsibility for the project which will be critical for this type of multi-sectoral engagement. In addition, municipalities where works will take place (CUA, Bemasoandro, Anosizato, and Andranonahoatra) and who have more direct contact with neighborhood organizations affected by the works, should also develop a sense of ownership. The project, especially the technical working groups set up around key critical activities, aim to ensure that all stakeholders -- including the CUA and other municipalities, relevant ministerial departments, agencies such as APIPA and SAMVA -- drive relevant project components and sub-components. Mainstreaming

community participation throughout the project activities will strengthen project ownership at the direct beneficiary level and boost community oversight.

77. ***Sustainability of investments.*** Sustainability of investments mostly depends on the provision of adequate funding for routine and periodic maintenance of flood control assets on one hand, and community urban services, including solid waste management, on the other. Resources allocated to APIPA for the operation and maintenance of critical flood management and drainage infrastructure are not sufficient. In addition, CUA resources are scarce and do not allow any serious scale-up or maintenance of local services. Institutional assessments are planned under the project's institutional activities to explore long-term sustainability of O&M practices within these institutions and will provide an informed maintenance hierarchy to optimize maintenance expenditures and ensure that key assets located in areas of high risk of flooding are maintained effectively. Furthermore, the project provides TA support to CUA to enhance its municipal revenues.

D. Role of Partners

78. ***Partnership Arrangements.*** Under the leadership of M2PATE, a donor coordination group has been established to map all urban projects and investments and seek synergies and complementarity. There are several ongoing investments at the Greater Antananarivo level. AFD is financing (i) an urban upgrading project "*Lalankely* 3" (Euro 23 million) focusing on 75 neighborhoods in 25 different communes of the GA area, outside of the PRODUIR target area; and (ii) an urban sanitation project "PIAA" (Euro 28 million) which includes the development of a drainage and sanitation master plan for Greater Antananarivo (co-financed by EU) and priority sanitation infrastructure works (sewerage and drainage). Finally, JICA is financing the urban land use master plan (PUDi) for Greater Antananarivo (Euro 3.5 million). The task team is closely coordinating with AFD, JICA and European Investment Bank (EIB) to ensure complementarity of all investments.

V. KEY RISKS

A. Overall Risk Rating and Explanation of Key Risks

Risk	Rating
Political and Governance	S
Macroeconomic	M
Sector Strategies and Policies	M
Technical Design of Project	M
Institutional Capacity for Implementation and Sustainability	H
Fiduciary	S
Environmental and Social	H
Stakeholder	S

Overall Preparation and Implementation Risk	**S**

79. **The overall project risk rating is Substantial.** The multidisciplinary and complex nature of the project including the framework design approach contributes to a significant project risk, in particular in terms of fiduciary capacity, social and environmental, and governance. In terms of **Political and Governance Risk**, risks are substantial in both the short- and medium-term. Presidential elections, scheduled for November 2018, will introduce additional uncertainties considering Madagascar's lack of institutionalized processes for national elections, exacerbated by governance challenges resulting from strained coordination between central and municipal governments. To help mitigate this risk, the project will continue to provide TA to the Integrated Urban Water Management Platform, created with support from a Bank-executed Advisory Services and Analytics (ASA), which brings together the relevant stakeholders to build consensus around strategic activities affecting the metropolitan area (such as flood management and solid waste management). **Institutional Capacity for Implementation and Sustainability Risk** is high and required the introduction of mitigation measures that include delegating key PMU responsibilities under Component 1.1 and 1.2 to a delegated contract manager (AGETIPA) which has more experience in World Bank policies and procedures. The use of a delegated contract manager will also address the substantial **Fiduciary Risk** that exists in terms of the proper use and reporting of projects funds.

80. **Environmental and Social Risks** are estimated as high due to the nature of the works being financed and the complexity of resettlement options given the lack of a functioning land market in Antananarivo which forces most families to opt for informal markets. The delegated contract manager will also manage the social and environmental safeguards instruments being put into place to address involuntary resettlement, as well as the environmental risks anticipated during the rehabilitation of the drainage canal and disposal of the canal sludge. Finally, **Stakeholder Risk** is estimated as substantial due to the number of stakeholders involved. Sub-component 1.3 has been designed to address stakeholder coordination and build consultative platforms for community stakeholders to stay updated during project implementation.

VI. APPRAISAL SUMMARY

A. Economic and Financial Analysis

81. The economic analysis was conducted using a range of data and analysis, including (i) the development of economic impact models that use the results of a recent household survey of Antananarivo and surrounding areas conducted by the Social, Urban and Resilience Global Practice[7]; (ii) detailed flood modelling as part of the feasibility study of a selection of the planned activities under Component 1; and (iii) additional large-scale flood impact modelling for the target area. This section summarizes the main results of the economic analysis. The full analysis is provided in Annex 4.

[7] Greater Antananarivo: urban poverty and resilience study (Homman et al. 2017)

82. The project investment amounts to a total of US$75[8] million. Important returns are expected to benefit the residents of Antananarivo, about 650,000 people, who live in an area prone to chronic flooding during the rainy season. The intervention is expected to reduce significantly the exposure of a total area of 15.9 square kilometers, including at least 14,745 buildings[9], to 10-year and probably 20-year return period flooding, lowering property damages and the health-risks associated to stagnant and contaminated water, particularly for the poor. Urban upgrading investments, to be selected during the project, would enhance those benefits for the entire population through the provision of mobility and accessibility infrastructure and the provision of social services. Capacity building, and institutional strengthening would develop key agencies and municipality management capacity and augment the sustainability of the benefits in the long-term. The economic analysis shows that an integrated approach encompassing all of these infrastructural and non-infrastructural aspects is needed to generate a positive economic impact in this complex setting. The World Bank has a high added value given its active involvement across sectors and levels of government in Madagascar, and its unique experience in complex urban resilience operations in the region. Since most of the project returns are non-monetary and not marketable (i.e. improvements in livelihood and reduction of poverty), private sector financing cannot be accessed and the use of public funds is essential.

83. The net present value of the impact of the project is estimated at US$24.8 million, i.e. a benefit-cost ratio of 1.38 at a discount rate of 5 percent (Table 1). At this discount rate, the direct benefits of flood risk reduction amount to 16 percent of the total impact when assuming the new infrastructure would withstand a 20-year return period flood. The overall success of the project, however, lies in its ability to contribute to a healthier, safer environment that is more conducive to growth. The potential impact on benefits to the livelihoods of households living in poverty amounts to US$32.4 million at a 5 percent discount rate. The projects' economic rate of return with those benefits is estimated at 9.8 percent.

84. The potential capacity of development of the area is measured through the potential appreciation of the property assets based on the property values observed in non-risky neighborhoods.[10] A large portion of the dwellings in the area being rented (40 percent) or occupied for free (16 percent), the project would likely also benefit real estate owners outside the areas. Nevertheless, the residents of the area would benefit 44 percent of the expected real estate asset appreciation. Although better-off households would benefit most, poor home owners (applicable to approximately 34 percent of the poor population of the area) would capture 39 percent of those gains.

85. Improved health, easier access to safe drinking water would reduce poverty and inequity. Three quarters of the health gains from improved sanitation, equivalent to about US$13.6 million, come from averted diseases by poor children aged 0 to 5 years living today in front of non-functioning drains. Reducing barriers to water collection would improve the livelihood of 45 percent of the poor population of the area with currently sub-optimal water consumption.

[8] The project is for US$75 million of which US$6.5 million for project management, coordination, monitoring and evaluation is not included in the economic appraisal.
[9] Estimate made by a local contractor (BRLI) based on satellite image. Based on the enumeration done in the area for the households' survey for the WB urban poverty and resilience study, this figure could be higher. Two scenarios (with this and a higher number of buildings) were consequently analyzed.
[10] Non-risky neighborhoods as defined by Hommann et al. 2017.

86. The investments for urban upgrading will focus on mobility (e.g. roads, foot-paths), water and sanitation (e.g. public showers and toilets) and public spaces (e.g. parks, green spaces). The precise nature and location of the interventions will follow from a comprehensive urban plan that will be created for the project area. The resulting amount of operating and maintenance costs could not be factored in. The larger the funding of the subcomponent and the greater the demand for public services, the higher these costs will be. The investments in governance and resource management in component 3 would contribute to keep these additional costs controlled and reduce their fiscal opportunity costs.

Table 1: Summary table of estimated cost-benefit analysis results based on the information currently available. Benefits are quantified over a 30-year project lifetime

Effect	**Mechanisms**	US$ million *discount rate*	
		5%[c]	***15%***
Project costs	Investment	63.6	54.0
	Operating costs and maintenance	1.6	0.7
Present costs		**65.2**	**54.7**
Demand in labor, goods and services	Investment Institution, capacity Implementation	30.7	25.6
Flood resilience	Reduced damages to properties	10.4[a]	3.9
Economic Development and improved environment	Property value	49.0[a]	14.2
Present benefits		**90.0**	**43.7**
Net present value (NPV)		24.8	-11.0
B/C ratio		1.38	0.80
Economic rate of return		**9.8%**	

Notes: [a]) based on conservative estimate of property assets of 14745 residential and commercial and public buildings equivalent to US$ 343 million (about 3.4 percent of GDP) [b]) based on a population of 650,000 inhabitants [c]) EU social discount rate, 2014[11]

B. Technical

87. **The project design builds on successful approaches and lessons learned, the findings of diverse assessments while also considering numerous technical options needed to build long-term resilience in GA**. This will be gradually strengthened during project implementation to optimize on the available funding and to ensure that decisions are evidence-based and cost-effective. Given that the issues contributing to flood risk in GA are multi-faceted and interlinked, various alternatives were considered during project preparation. These included: (i) focusing only on drainage and flood risk management infrastructure, (ii) scaling the AFD-funded Lalankely urban upgrading modalities, and (iii) adopting a selective and retail approach addressing key flood risk issues, namely: urban upgrading; urban drainage;

[11] Guide to Cost-Benefit Analysis of Investment Projects, European Commission, December 2014

solid waste management (SWM); land-use planning and housing accessibility; municipal finance and revenue enhancement; and flood control assets management.

88. While the project tackles the knowledge deficit across all the above, it only supports select physical investments aimed at: (i) improving urban hydraulics (drainage, dikes, canals, etc.) and reducing flood risks in selected areas of GA; and (ii) improving living conditions in complementary selected areas of GA. The design of the soft components assumes the importance of the complementary aspects required to build comprehensive resilience in GA, which will build a pipeline of knowledge for the Government, and build the needed knowledge base to design the future planned programmatic operations. By doing so, the project assumes that investing in flood risk management infrastructure, coupled with urban upgrading, urban strategic and detailed planning, improving solid waste management systems, and enhancing financial viability of CUA and neighboring municipalities are the comprehensive pillars for long-term resilience building of GA.

89. The equilibrium between short-term quick-wins and long-term impactful investments has been calibrated and revised during appraisal to reduce overall project risk, ensure immediate impact on peoples' lives – highly exposed to flood-risks – and build a first pipeline of experience on both flood risk management and urban upgrading that will feed into the design of the longer-term interventions.

90. The project considers community and citizen engagement as a parallel theme that cuts across all sub-components and activities. The project will explore traditional and novel modalities to engage communities in the design and implementation of investments in their neighborhoods, but also in more macro exercises related to urban planning and design among others. The project will aim at closing the beneficiary loop via the inclusion of the GRM mechanism at diverse levels of government. Quick-win interventions embedded in both sub-components 1.1 and 1.2 do aim as well at engaging communities in early stages of project implementation, and bringing them on-board in the design and implementation of longer-term interventions impacting their neighborhoods and lives.

91. The Institutional setup described in detail in relevant sections of this PAD builds on previous experiences of AGETIPA in implementing Bank projects, repositioning institutional leadership at M2PATE, positioning CUA in the driver's seat with regards to its targeted activities, and actively engaging the diverse stakeholders involved in above-mentioned technical themes. This approach will push through existing siloed institutional inertias and build more coherent and integrated efforts to resilience building.

C. Financial Management

92. The Ministry in charge of Presidential Projects, Land Use Planning and Equipment (M2PATE) will assume the ultimate responsibility for project coordination. The M2PATE has been the host Ministry of several UN financed projects including the World Bank financed project -Integrated Growth Poles and Corridor Project 2 (P113971) effective in March 2015, but has never managed the fiduciary aspects.

93. For the current project, the M2PATE will sign a Delegated Contract Management Agreement with the AGETIPA, for the implementation of components 1.1 and 1.2 of the project, representing over 75 percent of the total financing. An FM assessment of AGETIPA was carried out to determine (a) whether there were adequate FM arrangements in place to ensure the funds will be used for the intended purposes in an efficient and economical manner and capable of correctly and completely recording all transactions

related to the project; (b) the project's financial reports will be prepared in an accurate, reliable, and timely manner; and (c) the project assets will be safeguarded.

94. AGETIPA is an Association dedicated to the implementation of several infrastructure type of projects financed by the donors as well as the government. AGETIPA implemented projects financed by the World Bank (IDA 2591MAG) closed in December 1998. Currently AGETIPA is managing five (5) projects in cooperation with M2PATE, two projects of the Government and two projects of the AFD "French Development Agency". Staffing, reporting, auditing arrangements within AGETIP are adequate. The assessment concludes that AGETIPA has satisfactory fiduciary arrangements in place.

95. However, for the implementation of this project, it has been agreed that the M2PATE will handle the financial management aspects, namely activities such as accounting, reporting, payment.

96. The overall risk for the Project is rated **substantial** due to the inherent fiduciary risk at country level, but also to the lack of experience of M2PATE in project management. Mitigation measures will be mostly implemented with the Project Preparation Advance and are comprised of: (a) the recruitment of qualified and experienced FM staff composed of one Financial Manager and one Accountant for the PIU under M2PATE, (b) the development of an FM procedures manual as part of the Project implementation manual (PIM), (c) the recruitment of a senior Internal Auditor to support the audit unit under the M2PATE, (d) the purchase of an adequate accounting system for the PIU, and (e) the selection of an independent auditor to review the compensations statement prior payment.

D. Procurement

97. A Procurement Code was enacted in July 2004 and included simplification of procedures and compliance with international standards. The Procurement Code has also been supplemented by regulations, procedures manuals, and standard bidding and other procurement documents. Nevertheless, during the preparation of the project, it was agreed with the Borrower that the 'World Bank Procurement Regulations for IPF Borrowers' dated July 1, 2016, revised in November 2017 (the Procurement Regulations) will govern the Project procurement activities and Standard Procurement Documents (SPDs) will be used. The Project Implementation Manual will reflect the arrangements for the proposed project.

98. M2PATE will have the overall responsibility for project implementation but, it was agreed that a Project Management Unit PMU (a department of M2PATE) will implement procurement activities for Component 1.3 and Component 2 and AGETIPA those for Components 1.1 and 1.2. A Procurement Capacity Assessment of the respective units at M2PATE and AGETIPA, including training needs and arrangements, was conducted as part of project preparation. The procurement risk assessment revealed that the level of risk is substantial due to changes in the conditions of implementation and requirements for the application of the Bank's new procurement framework. While AGETIPA procurement teams are currently duly staffed with proficient procurement officers with substantial experience in managing procurement operations during implementation of other donors-financed projects, the M2PATE would recruit a procurement officer to act as technical assistant for the civil servant in place. The Project will support the additional capacity building of these specialists and the World Bank's procurement team will continue to provide coaching and support as required. After mitigation measures are implemented, the residual risk would remain substantial. Mitigation measures are detailed in Annex 3.

99. During project preparation, the two teams elaborated a Procurement Strategy for Development

Projects (PPSD) which covers all project activities and an initial 18-month Procurement Plan[12] has been developed and covering procurement activities for the entire project. After the project is approved by the Board it would be published on the Ministry of Finance and Budget website and the Bank's external website. The Procurement Plan will be updated in agreement with the Bank at least annually or as required to reflect the actual project implementation needs and improvements in institutional capacity. The prior review thresholds governing the Procurement Plan are those included in the guidance note for prior reviews and issued by the APM. The Project will use the World Bank's online procurement planning and tracking tools, Systematic Tracking of Exchanges in Procurement (STEP), to prepare, clear, and update its Procurement Plan and to carry out all procurement transactions.[13] M2PATE PMU and AGETIPA's staff have been trained to use the STEP.

100. Procurement under the proposed operation will be guided by the following documents: (i) the 'World Bank Procurement Regulations for IPF Borrowers' dated July 1, 2016, revised in November 2017 (Procurement Regulations); and (ii) the World Bank's Anti-Corruption guidelines called "Guidelines on Preventing and Combatting Fraud and Corruption" revised as of July 1, 2016. The project's implementation manual will be drafted in accordance with these documents and submitted to the Bank for approval. The PIM would also include a complaint management system in accordance with Annex III of the World Bank Procurement regulations for IPF Borrowers.

E. Social (including Safeguards)

101. The project is rated an Environmental Category A project because the potential environmental and social impacts, while predictable, could be significant, permanent, large-scale and irreversible. Nevertheless, all social impacts of the individual project activities are expected to be site-specific and reversible with the most significant social impacts related to land acquisition, particularly under Sub-component 1.1. Social impacts are assessed and mitigation measures identified as part of the development, consultation and disclosure of an Environmental and Social Management Framework (ESMF) in accordance with OP 4.01 Environmental Assessment. OP 4.12 Involuntary Resettlement is triggered for this project due to land acquisition and involuntary resettlement emanating from Sub-component 1.1 and Sub-component 1.2. There are no Indigenous Peoples as defined by the policy present in the project areas, thus OP 4.10 is not triggered.

102. OP 4.12 Involuntary Resettlement. The activities under subcomponent 1.1 "Improvements of Canal, Drainage and Sanitation Infrastructure" and 1.2 "Neighborhood Upgrading" will result in land acquisition, and permanent and temporary involuntary resettlement. Along the C3 Canal, the number of households that will be affected from the works technical footprint is expected to be 583 households. In addition, there are 509 PAPs with small-scale, informal economic activities along the canal that may be affected from loss of access to the water, including laundry services and collection for sands from the

[12] The Procurement Plan specifies for each contract (a) a brief description of the activities/contracts, (b) the selection methods to be applied, (c) the estimated cost, (d) time schedules, (e) the World Bank's review requirements, and (f) any other relevant procurement information. Any updates of the Procurement Plan shall be submitted for the World Bank's approval.

[13] All goods and non-consulting services will be procured in accordance with the requirements set forth or referred to in Section VI. Approved Selection Methods: Goods, Works and Non-Consulting Services of the Procurement Regulations. Consulting services will be procured in accordance with the requirements set forth or referred to in Section VII. Approved Selection Methods: Consulting Services of the Procurement Regulations, to the Project Procurement Strategy for Development (PPSD) and the procurement plan approved by the World Bank.

river's sediment and selling of wood and agriculture products. A Resettlement Action Plan has been developed and consulted and was disclosed on April 5, 2018 for the resettlement impacts of the drainage and infrastructure works under subcomponent 1.1. The resettlement impacts of activities under sub-component 1.1 related to the construction of pumping station and sludge disposal site and sub-component 1.2 "Neighborhood Upgrading" have been estimated at 660 PAPs, but will only be known more exactly during project implementation when activities and works sites have been identified using a participatory and inclusive approach. Minimizing resettlement impacts will be one of the criteria used in selection of activities. A Resettlement Policy Framework has been developed, consulted and disclosed on April 5, 2018 to guide the resettlement in this subcomponent and includes specific guidelines on screening activities for minimizing resettlement, including a negative list of activities. The total number of people affected by Involuntary Resettlement is expected to be 3,691 persons. Three resettlement sites have been identified and provided as options.

103. Sub-components 2.1, Strengthening capacity for inclusive and resilient urban management, and 2.2, Municipal Management, include Technical Assistance Activities that will lay the foundations for a more integrated approach to resettlement across the CUA through a series of studies and capacity building of M2PATE in managing involuntary resettlement of populations at risk of flooding and other disasters in precarious neighborhoods.

104. **Social inclusion of vulnerable groups**. Key vulnerable groups include the population living and/or having commercial activities on the existing right-of-way of the C3 canal, children, disabled people, elderly, waste-pickers, youth affected by crime and violence and girls and women at risk of sexual exploitation**.** A clear grievance mechanism will be adopted during project implementation with management of gender-based violence complaints treated in collaboration with specialized institutions on gender-based violence (Ministry in charge of social protection, NGOs, and advocacy associations). A more in depth social assessment of these groups will be conducted as part of the study to the design of the urban upgrading component and will include an investigation of the social context in the project's implementation areas, including identification of ways to include the most vulnerable and marginalized groups in the decision-making and implementation process, identification of negative behaviors that could hinder the project's outcomes and sustainability, as well as comprehensively analyze the social risks that may result from the project.

105. **Gender inclusion.** Extreme poverty incidence, though not absolute poverty, is higher among female-headed households in Madagascar. With regards to the urban development context, given their different gender-based roles and identities, women and men have a distinct perception of the environment they inhabit. They also produce and manage diverse kind of waste and have different visions on how to recycle and reuse it. The way they pollute the environment also changes based on their different social roles and function. Given this context, an integrated gender-lens has been applied to the project. Female participation in project design and implementation as well as access to project benefits is prioritized in all project components. Specific measures include: separate consultations to ensure that activities respond to women's needs and priorities, inclusion of gender targets in the recruitment of construction workers, specific measures to protect vulnerable women and girls and sex-disaggregated reporting of beneficiary feedback surveys.

106. **Citizen Engagement** has been prioritized in this project both to ensure sustainability of the

investments and to improve participation of residents. Sub-component 1.3 finances good practice activities to enhance citizen engagement in the project, including support for municipal consultation mechanisms and the development of a formal stakeholder engagement plan for the project.

F. Environment (including Safeguards)

107. **Project category**. The project is categorized as an Environmental Category A project because the potential environmental and social impacts and risks of the project while predictable could be significant, permanent and large-scale. The project will involve new land acquisition and could involuntarily displace approximately 2,111 PAPs along the C3 canal. Transport and disposal of contaminated materials (about 100,000 m3) from dredging works could affect health and safety of workers and communities along the transport route and could pollute groundwater if disposal site is not designed and operated properly. But over the long term, the project will contribute to environmental improvements from dredging and river works and will also decrease the risk of flooding and associated public health risks and improve living conditions in selected areas of GA.

108. **Policies triggered.** Four environmental and social Safeguard Policies have been triggered by this operation : OP 4.01 (Environmental Assessment); OP 4.12 (Involuntary Resettlement); OP 4.11 (Physical Cultural Resources); and OP 4.04 (Natural Habitats). OP 4.04 is triggered due to the potential impacts of dredging and river works on downstream rivers but also due to the potential long term environmental benefits of the project to the environment. Some of the activities whose sites are not yet identified (e.g., disposal site for the dredged materials) may also impact natural habitats. OP 4.11 is triggered as the ESIA identified three sites of cultural or religious significance (two churches and one cock-fighting arena) that will be affected by the C3 works. Chance finds might also be encountered during implementation.

109. To address these safeguard issues and meet the requirements of the policies, the Recipient has prepared: (i) an Environmental and Social Management Framework (ESMF) for the subprojects in mobility and accessibility infrastructures, sanitation and hygiene services and resilience investment whose exact locations could not be determined prior to or at project appraisal and (ii) a full Environmental and Social Impact Assessment (ESIA) with a specific ESMP for the civil works for the drainage and rehabilitation of the dikes and C3 canal. Specific mitigation for natural habitats and the physical and cultural resources to be affected by the C3 works are included in the ESMP. A separate ESIA/ESMP for the canal sludge disposal site will also be prepared as a condition of effectiveness of the credit.

110. **Environmental and Social Management Framework (ESMF):** Since the precise locations and potential impacts of future subprojects in mobility and accessibility infrastructure, sanitation and hygiene services and resilience investments (subcomponent 1.2) could not be identified prior to or at appraisal, an Environmental and Social Management Framework (ESMF) has been prepared to be used to screen sub-project proposals for environmental, social, gender, and health and safety impacts. The ESMF includes a generic Environmental and Social Management Plan (ESMP) that will take into account the urban environmental and social review and describe the environmental and social profiles in the project target area. The ESMF outlines an environmental and social screening process for future subprojects to ensure that they are environmentally and socially sound and sustainably implementable, in line with the Government of Madagascar (GOM) and World Bank policies and guidelines on environmental and social impact management. Prior to commencement and as soon as subproject implementation sites are

identified, each subproject/activity will be screened per the established environmental and social screening procedures detailed in the ESMF. The screening outcomes will determine the need to prepare an Environmental and Social Impact Assessment (ESIA) and a freestanding Environmental and Social Management Plan (ESMP).

111. **Environmental and Social Impact Assessment (ESIA).** An Environmental and Social Impact Assessment (ESIA) has been prepared for the civil works related to the rehabilitation of the C3 canal. The construction stage impacts mainly relate to noise, vibration, dust, social conflict risks and safety issues with the important number of workers during the civil works; health and safety issues for workers, the traffic disturbance and accident risks with the sludge transportation, ground water pollution risks with the polluted sludge, land acquisition for the sludge disposal site. A detailed laboratory analysis on a sample of the canal sludge has been performed as part of the EISA to determine risks and toxicity. Appropriate mitigation measures need to be introduced (from dredging to transport and final disposal) for the 100,000 cubic meters of estimated canal sludge. In terms of final disposal, the current city dumpsite of Andralanitra will reach its full capacity in less than four years and a new landfill site has not yet been identified. Therefore, the disposal site will be identified and an ESIA will be undertaken and ESMP prepared prior to project effectiveness. The disposal site is required to be operational before dredging commences.

112. **Institutional arrangement:** The ESMF and RPF include institutional arrangements outlining the roles and responsibilities for the various stakeholder groups involved, for screening and approval of activities, as well as implementation and monitoring of their mitigation measures and capacity building activities needed. The PMU will be composed of a full time environmental specialist and a social development specialist to ensure day-to-day safeguard works and to assess project activities in compliance with the prepared safeguard documents approved by the Bank. They will be hired in compliance with the comprehensive ToR developed in the ESMF and agreed with the World Bank. The Bank's safeguards team will ensure additional capacity building support to strengthen the technical capacity on both social and environmental safeguards management. The environmental and social safeguard specialists of PRODUIR will work collaboratively with the National Office of Environment (ONE), the national authority responsible for environmental and social management and also ensure compliance with national regulation and safeguards document reviews. The ESMF has proposed thematic training sessions for the main actors involved in the PRODUIR. The safeguards training workshops will be iterative and open to other key stakeholders including beneficiary communities, private sector (consultant firms, CSOs, etc.) with the aim of reinforcing the grounding of public consultation and participation to foster more engagement, and the ownership and social accountability for the sustainability of project implemented activities. It was agreed that an Environmental and Social Panel will be established at the PMU to support and advise the project on implementation of safeguard measures and requirements following a ToR approved by the Bank.

113. **Disclosure of safeguard documents.** All the safeguard instruments have been subjected to public consultations and disclosure. The safeguards instruments (ESMF, RPF, ESIA, RAP) have been approved by the World Bank and disclosed in-country on April 5, 2018 and on the same date at the Infoshop in compliance with the World Bank safeguards and national policies and Disclosure Policy.

G. Other Safeguard Policies

114. No other safeguards policies are triggered.

H. World Bank Grievance Redress

115. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit *http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service*. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

VII. RESULTS FRAMEWORK AND MONITORING

Results Framework

COUNTRY : Madagascar

Integrated Urban Development and Resilience Project for Greater Antananarivo

Project Development Objectives

The Project Development Objective is to enhance urban living conditions and flood resilience in selected low-income neighborhoods of Greater Antananarivo; and to improve the Recipient's capacity to respond promptly and effectively to an Eligible Crisis or Emergency.

Project Development Objective Indicators

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Name: People provided with improved urban living conditions	✓	Number	0.00	650000.00	Annual	Project Progress Report	M2PATE/AGETIPA
People provided with improved urban living conditions - Female (RMS requirement)	✓	Number	0.00	325000.00	Annual	Project Progress Report	PMU/M2PATE
Description:							
Name: People protected by restored or improved flood		Number	0.00	43500.00	Annual	Results of the hydraulic modeling conducting by the	AGETIPA

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
protection infrastructure						engineering consultant to assess the impact of the drainage and flood protection infrastructure	
Description: The indicator measures the number of houses which benefit from the flood protection investment undertaken under the project, which include the river dikes, dredging and rehabilitation of C3 Canal							
Name: Share of direct project beneficiaries that are satisfied with the project interventions		Percentage	0.00	70.00	Semi-annual	Beneficiaries satisfaction survey	PMU/M2PATE
Description: The indicator measures the degree of satisfaction of project beneficiaries through a Beneficiary Feedback Survey to be conducted twice a year.							

Intermediate Results Indicators

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Name: People provided with access to improved sanitation services	✓	Number	0.00	112000.00	Annual	Project Progress Report. Number of people provided with access will be estimated by multiplying	AGETIPA

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
						the actual number of improved sanitation facilities with the estimated number of people per household using the improved sanitation facility.	
People provided with access to improved sanitation services - Female (RMS requirement)	✓	Number	0.00	56000.00	Annual	Project survey to count of unique users of new or improved sanitation infrastructure (female)	AGETIPA
Description: The indicator measures the cumulative number of people who benefited from improved sanitation facilities that have been constructed through operations supported by the World Bank.							
Name: Length of canals and embankments rehabilitated		Kilometers	0.00	17.00	Annual	Supervision Consultant. Project Progress Report. Measurement of implemented infrastructure	AGETIPA
Description: The indicator measures the total length of canals and dikes upgraded under sub-component 1.1							
Name: Amount of sludge dredged from the C3 and		Cubic	0.00	100000.00	Semi-annual	Supervisory Engineer and	AGETIPA/M2PATE

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
safely disposed		Meter(m3)				Project Progress Report	
Description: The indicator measures the quantity of sludge collected from the works on the C3 canal which are adequately treated and disposed at the selected site(s), as per the procedures detailed in the Environmental-Social Management Plan (ESMP).							
Name: Roads constructed or rehabilitated		Kilometers	0.00	6.00	Annual	Supervision Consultant. Project Progress Report.	AGETIPA
Description: The indicator measures the number of kilometers of all roads constructed, reopened to motorized traffic, rehabilitated, or upgraded under the project and contributing to improvement on urban accessibility.							
Name: Pedestrian paths constructed or rehabilitated		Kilometers	0.00	18.00	Annual	Supervision Consultant. Project Progress Report.	AGETIPA
Description: The indicator measures the number of kilometers of all pedestrian paths constructed, rehabilitated or upgraded under the project and contributing to improvement on urban accessibility.							
Name: Neighborhoods (Fokontany) which have prepared and tested a contingency plans and evacuation strategy		Number	0.00	20.00	Semi-annual	Project Progress Report and BNGRC reporting	AGETIPA/M2PATE

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Description: The indicator measures the successful preparation of contingency plans and the testing of those plans during simulation exercises.							
Name: Person-days of temporary jobs created		Number	0.00	60000.00	Semi-annual	Progress reports by firms contracted for activities under sub-components 1.1 and 1.2.	AGETIPA
Description: The indicator measures the number of temporary jobs that are created during the implementation of the works, which include construction and community workers.							
Name: Increase of water and sanitation community groups (RF2) operational within the project area		Percentage	10.00	50.00	Semi-annual	Project Progress Report	AGETIPA/M2PATE
Description: This indicator measures the progress in establishing new or strengthening existing RF2 (Water, sanitation and hygiene community groups; Rafitra Fikojàna ny Rano sy Fidiovana) under the project, to support local water and sanitation standards.							
Name: Detailed Urban Plan completed in a 2-year timeframe		Yes/No	N	Y	Year 2	Project Progress Report	AGETIPA/M2PATE
Description: The indicator measures the development of a detailed urban plan developed for the target area within a 2-year timeframe.							
Name: Revenue Enhancement strategy and		Yes/No	N	Y	Annual	Project Progress Report	CUA

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
action plan for CUA							
Description: The indicators measure the development and approval of a Revenue Enhancement strategy and action plan for CUA.							
Name: Percentage of complaints regarding project activities addressed per the grievance redressal system established by the project		Percentage	0.00	100.00	Semi-annual	Inventory of complaints and grievance redress measures	PMU/M2PATE
Description: The indicator measures the effectiveness and efficiency of the grievance mechanism, to be established by the project, in terms of the percentage of project-related grievances received from intended beneficiaries that are promptly reviewed and effectively addressed.							
Name: Annual increase of properties for which owners have been identified for tax purposes over previous year		Percentage	0.00	10.00	Annual	CUA Information System	CUA
Description: The indicator measures improvement in the registration of residential and commercial properties to support tax collection by the local government.							
Name: Solid Waste Management Strategy approved		Yes/No	N	Y	Once by year 4	Project Progress Report	PMU/M2PATE
Description: The indicator measures the development and approval by government of a Solid Waste Management Strategy for Greater Antananarivo.							

Target Values

Project Development Objective Indicators

Indicator Name	Baseline	YR1	YR2	YR3	YR4	YR5	End Target
People provided with improved urban living conditions	0.00	0.00	50000.00	200000.00	300000.00	100000.00	650000.00
People provided with improved urban living conditions - Female (RMS requirement)	0.00	0.00	25000.00	100000.00	150000.00	50000.00	325000.00
People protected by restored or improved flood protection infrastructure	0.00	0.00	10000.00	15000.00	15000.00	3500.00	43500.00
Share of direct project beneficiaries that are satisfied with the project interventions	0.00	0.00	25.00	50.00	60.00	70.00	70.00

Intermediate Results Indicators

Indicator Name	Baseline	YR1	YR2	YR3	YR4	YR5	End Target
People provided with access to improved sanitation services	0.00	0.00	10000.00	20000.00	80000.00	112000.00	112000.00
People provided with access to improved sanitation services - Female (RMS requirement)	0.00	0.00	5000.00	25000.00	40000.00	56000.00	56000.00

Indicator Name	Baseline	YR1	YR2	YR3	YR4	YR5	End Target
Length of canals and embankments rehabilitated	0.00	5.00	10.00	17.00	0.00	0.00	17.00
Amount of sludge dredged from the C3 and safely disposed	0.00	0.00	20000.00	40000.00	40000.00	0.00	100000.00
Roads constructed or rehabilitated	0.00	1.00	2.00	3.00	0.00	0.00	6.00
Pedestrian paths constructed or rehabilitated	0.00	0.00	3.00	5.00	10.00	0.00	18.00
Neighborhoods (Fokontany) which have prepared and tested a contingency plans and evacuation strategy	0.00	0.00	5.00	10.00	5.00	0.00	20.00
Person-days of temporary jobs created	0.00	0.00	10000.00	30000.00	20000.00	0.00	60000.00
Increase of water and sanitation community groups (RF2) operational within the project area	10.00	0.00	10.00	20.00	20.00	0.00	50.00
Detailed Urban Plan completed in a 2-year timeframe	N	N	N	Y	Y	Y	Y
Revenue Enhancement strategy and action plan for CUA	N	Y	Y	Y	Y	Y	Y
Percentage of complaints regarding project activities addressed per the grievance redressal system established by the project	0.00	80.00	100.00	100.00	100.00	100.00	100.00

Indicator Name	Baseline	YR1	YR2	YR3	YR4	YR5	End Target
Annual increase of properties for which owners have been identified for tax purposes over previous year	0.00	10.00	10.00	10.00	10.00	10.00	10.00
Solid Waste Management Strategy approved	N	N	N	N	Y	Y	Y

ANNEX 1: DETAILED PROJECT DESCRIPTION

COUNTRY : Madagascar
Integrated Urban Development and Resilience Project for Greater Antananarivo

Component 1 - Improving urban drainage, services and resilience in targeted areas SDR 39.9 million (US$ 58 million equivalent)

1. This component, via its integrated design, aims to invest in resilience building in selected target areas of Greater Antananarivo. More specifically, this component will invest in both (i) flood and drainage risk reduction, (ii) urban upgrading and integration of vulnerable neighborhoods into the urban fabric, while ensuring (iii) effective citizen engagement in diverse processes of design and implementation.

2. The target area where both flood protection/drainage improvements and urban upgrading interventions will be focused were selected in an inclusive manner to ensure a focus on both exposure to flood risks, that are expected to increase in intensity with climate change, and poverty. This target area, which covers parts of the first and fourth "arrondissements" of the CUA, as well as the extension to three neighboring communes (Bemasoandro, Andranonahoarta, Anosizato Andrefana), consist of the most vulnerable areas to flooding based on most recent flood modeling. Furthermore, based on diverse poverty assessments, field visits, and NGO consultations, they are considered to be the neighborhoods with the highest levels of poverty in the city. Finally, the selected target area includes a strong combination of high-dense areas and fast growing urban spaces.

3. **Sub-component 1.1: Improvements of Canal, Drainage and Sanitation Infrastructure (US$ 36.6 million).** The objective of this sub-component is to improve the flood protection and drainage functions of major existing infrastructure that have been functioning at very low levels of performance for several years due to neglect, lack of maintenance, vandalism or encroachment on river and canal banks. Two specific types of infrastructure assets will be rehabilitated, one of three major drainage canals that provides storm water drainage for the western portion of the urbanized floodplain (Canal C3) and the embankments/dikes along sections of the Ikopa and Sisony Rivers that flow through the project's pilot intervention area.

4. Canal C3. The rehabilitation of the 12-km long canal, in addition to the two flood retention ponds (Anosibe and Andavamamba) that are part of the C3 system and the intersections with the smaller primary canals that drain into the C3, is expected to include dredging, embankment stabilization and protection, removal of obstacles (both natural and man-made), cleaning of debris and vegetation, etc. This rehabilitation effort will enable the C3 system to regain its proper functionality. Constructed in 1993 as part of a previous World Bank project (Antananarivo Plain Development Project, P001512), the C3, Andriantany, and GR canals are the three major drainage and irrigation (in the case of the GR canal) assets that help to drain the growing city. Maintenance of the C3 has been irregular and ad-hoc. (For example, the cleaning of accumulated water hyacinths that has covered the flood retention ponds last occurred five years ago.) Along its 12-km siting, C3 cuts through many different types of urban areas (mostly low-income but some high property value areas), with different types of densities and settlement patterns. Along its banks there are different types of protection and varying degrees of structural integrity of embankments. Several kilometers of the canal also run through agricultural land (rice paddies still cover

large portions of the urban area) before it drains into the Mamba River via a major pumping station which requires rehabilitation. In practice, the C3 canal is utilized for multiple purposes including disposal of solid waste and reception of untreated black and grey water from homes or sewage from other nearby buildings that have been erected as a result of uncontrolled urban development. In its current status, the C3 is no longer fulfilling its original function and instead has become an environmental hazard. An important element of this rehabilitation will be the establishment of needed maintenance plans, protection measures, and behavior change of residents (included in Sub-component 2.3). While the management and maintenance of the C3 asset rests with APIPA, there are clearly other collaborative efforts required of other institutional (commune and SAMVA) and local stakeholders (community groups).

5. The specific rehabilitation works along the entire canal to be financed under this component are currently being designed. Preliminary studies estimate a cost of US$12.5 million for works on canal. Final costs may well exceed the US$22 million budget allocated to works under this sub-component, in which case a prioritization of works will be agreed with Government and the remaining works would be available for additional financing either by IDA or another financier.

6. Sludge disposal site. Accumulated sludge, sedimentation, and other materials that will be dredged from the canal are estimated to reach 100,000 cubic meters. This canal sludge will be treated and confined in a storage area to restrict negative impacts on the environment. Site identification and preparation of mitigation measures, technical design and construction/operation needs to be performed before the dredging works can begin.

7. System of river embankments and dikes. Similar to the major canals that drain the urbanized part of Antananarivo, a 131-km system of river embankments and dikes exist along the three main river systems (Ikopa, Mamba, Sisaony) that cross the Antananarivo floodplain. These assets are managed by APIPA. This system was built 50 years ago and similar to the drainage canals, is subject to ad-hoc repairs and maintenance. In addition to natural events, daily human activity is also challenging the structural integrity of this system. An entire riverine economy can be observed along and within the riverbed that includes brick-making, laundry washing, and extraction of sand and soil that are used for building materials. In many places along the river's embankments the gabion walls that were once erected for flood protection and erosion control purposes have been visibly vandalized by people who use those materials for other purposes. Repairing the dike system, especially along the left bank of the Ikopa River (which was the area that was severely breeched during the 2015 floods) will require an accompanying effort by local authorities to help monitor and control the activities by local residents along the river. Improvements to embankments and dikes will need to be prioritized and target those areas at risk of 10-year return floods.

8. The works to repair and rehabilitate embankments as well as their slopes, reconstruct dikes, introduce erosion control measures, repair gabion walls, introduce controlled access points, etc., being financed by this component are currently being designed during preparation of the project. Once the technical designs and costing estimates are completed, the decision will be taken for contracting these works either together or separately from the civil works along the C3.

9. *Resettlement costs.* Because of the uncontrolled occupation of urban land along certain portions of the C3 Canal, involuntary resettlement will take place only in certain areas. Because of the dynamic land market, albeit informal, the bulk of the permanent resettlement is expected to be absorbed by the local rental market and little need for land acquisition should be required. However, M2PATE identified three resettlement sites in Andavamamba, Soavimasoandro and Anosiala. The resettlement action plan indicates that 429 housing structures including 94 structures less than 5 square meters, corresponding to 583 households (since more than one household inhabits housing structures in several cases) and small businesses will be affected by this sub-component by both temporary and permanent resettlement. A socio-economic survey of an estimated 2,000 households has been conducted for a better understanding of the socio-economic characteristics of the affected areas.

10. Based on the census conducted by the Resettlement Action Plan, the total number of project affected persons under this sub-component will be 3,031, of which 2,111 will be affected by Canal C3 rehabilitation and 920 by the works for the pumping station and associated infrastructure. Given prior compensation costs associated with previous projects implemented in the country, the costs for resettlement are estimated to be around US$7,600,000. This cost includes the preparation and construction of three resettlement sites. Because of the weak budgetary position of government and the importance of not letting resettlement costs impede the progress of this project, approval of IDA resources for financing a portion of the resettlement costs for cash compensation for the entire project, up to US$5.93 million, has been requested and obtained.

Activity	Estimate Costing (US$)
Preparation of detailed designs, bidding documents and safeguards instruments	2,000,000
Supervision costs including implementation of safeguards measures	4,640,000
Works	22,000,000
Estimated resettlement costs including cash and in-kind compensation	8,000,000
Total sub-component 1.1	***36,640,000***

11. **Sub-component 1.2: Neighborhood upgrading (US$ 20.1 million):** This subcomponent will finance key urban infrastructure in the selected pilot intervention area. Those interventions will be planned and executed in tandem with drainage investments in sub-component 1.1. While the detailed nature of investments will be identified based on the participatory preparation of the Detailed Urban Plan for the intervention area, they will focus primarily on: (i) mobility and accessibility infrastructure such as roads and foot-paths, and street lighting; (ii) social services such as community development spaces, parks, markets and other public spaces; (iii) public health and hygiene investments such as solid waste management collection, public latrines, showers and, if feasible after reviewing the institutional arrangement, collective water fountains. A logic of safe shelters will be included in the provision of basic services to ensure that some of the structures/spaces can be used as evacuation spaces in times of emergency. The project will encourage the utilization of selected spaces as natural retention ponds, as well as permeable paving, by piloting innovative and cost-effective approaches to improve natural drainage and reduce urban rainwater runoff, which is usually a major cause of recurrent flooding.

12. The above mentioned Detailed Urban Plan (DUP) will be the guiding instrument for identifying any urban upgrading investments under this sub-component. The Terms of Reference of this study have been cleared by the World Bank. Those are oriented along:

a. Diagnostic of the target area: This will allow a detailed understanding of the on-ground infrastructure and service delivery realities and gaps, socio-economic fabric and situation, and the land and housing situation.

b. Quick wins for improving living conditions: Based on the above diagnostic, and to ensure deeper engagement with communities along diverse objectives of the project, quick-win interventions will be identified aiming at enhancing certain basic service delivery gaps. This will be followed by the preparation of respective technical and engineering studies.

c. Preparation of the Detailed Urban Plan: Based on the above-mentioned diagnostic, a detailed urban plan for the targeted area will be elaborated. This DUP will be multi-sectoral in nature, and be oriented toward cost-effective upgrading measures, favoring in-situ urban renewal options.

13. Based on the above DUP, prioritization of interventions will be conducted and a dual approach investment program to be financed under this project will be confirmed, and respective detailed engineering designs will be conducted. Based on this, this Sub-Component will finance two typologies of works:

a. Quick-win and no-regret interventions totaling US$5 million: Based on the first phase of the overall study, quick-win interventions will be identified and designed in the first three months following effectiveness. Those will allow early-on physical results and engagement of communities. This activity will aim at expanding the AFD's Lalankely methodology adopted by AFD into the Project's target area, and which will be utilized in their Lalankely III project. AGETIPA and M2PATE have already identified an early pool of works that will be considered during the preparation process of this Activity.

b. Structural Urban Upgrading totaling US$ 10 million: This activity will finance investments aiming at building on the above-mentioned DUP thorough diagnostic of the target area, and complement the quick-win interventions as well as the drainage works in Sub-Component 1.1, to ensure the targeted neighborhoods are further included in the urban fabric. Those works will

be prepared in an inclusive manner, to ensure the selected works have the strongest impact on the selected area.

14. This DUP builds on years of World Bank intervention in the urban sector as well as AFD's urban upgrading experience in Madagascar. This DUP, in its novel approach, seeks to lay the foundation for a more durable modality for urban upgrading, based on inclusive detailed planning, and a better understanding of long-term urban integration and upgrading needs, rather than limited quick fixes. The DUP will also allow more effective and impactful use of resources, based on proper analytical and consultative engagement.

15. This DUP will be developed in an inclusive manner. Specific engagement meetings will be conducted with technical stakeholders, institutional stakeholders, and more importantly residents in the targeted neighborhoods, to ensure those interventions are fully aligned with their priorities. Engagement processes will target more specifically women – building on the World Bank's wide experience in gender-related inclusion (see Box 1) - who will be the first to benefit from urban upgrading investments such as community spaces, health equipment, public spaces and street lighting among others. In this manner, the activities will aim to promote gender-sensitive interventions as noted in Box 1.

16. Activities under this component will help boost local Job creation within selected neighborhoods, which will help build increased project ownership and engagement around project objectives. AGETIPA has extensive experience in labor intensive construction techniques. For instance, labor intensive roads upgrading create 15 times more man-day labor effort than asphalt roads. This will also ensure mobilization and engagement of local neighborhood labor.

Box 1. Gender Mainstreaming in Urban Planning and Upgrading:

PRODUIR gender focused interventions will be informed by experiences from other countries, such as Bolivia, where the inclusion of gender aspects in urban development operations can foster project outcomes improving communities and women's lives.

Steps taken to develop a gender approach:

- Gender analysis is the key and first element undertaken to identify main gender gaps, analyze the specificity of the project's gender aspects and propose specific interventions to address them.
- Integration of gender analysis's findings in specific project components to ensure that project interventions respond to the identified gender needs.
- Allocation of resources in the project's budget to address the gender specific needs and opportunities.
- Inclusive consultations with women through all the project's development to assure understanding and integration of their specific needs.
- Participatory approach ensuring effective participation of women in community infrastructure implementation and decision-making.
- Promotion of women's employment at all levels of the project's development.
- Contextualization of project's component in local culture and traditions.

Promoted gender-sensitive interventions:

- Street lightening and indoor sanitation facilities to address violence against women
- Provision of land and assets title to promote land right equality
- Childcare facilities and community centers to enhance women's ability to participate in their communities
- Pedestrian-friendly infrastructure to allow people and specifically women, children and the elderly, to rest and have a space for socializing in front of their houses.

Reached gender-sensitive results:

- Violence against women reduced through street lightning and improved sanitation inside households.
- Provision of land and asset titles to women fostered their social status and supported them with more possibilities to access formal banking systems, credit and insurance.

17. This sub-component will finance consultant services for the preparation of the relevant safeguards related instruments following the identification of the investment and intervention program.

Activity	Estimate Costing (US$)
Preparation of the Detailed Urban Plan, engineering designs and bidding documents	1,400,000
Preparation of safeguards instruments	300,000
Supervision costs including implementation of safeguards measures	2,200,000
Works - Quick Win interventions	5,000,000
Works	10,000,000

Estimated resettlement costs including cash and in-kind compensation	1,200,000
Total sub-component 1.2	**20,100,000**

18. **Sub-component 1.3: Citizen engagement (US$ 1.3 million).** Strengthening a system of sustainable citizen engagement will include the following main activities to contribute both to the sustainability of infrastructure and investments in the project's target area, specifically the rehabilitation of Canal C3 and the system of dikes, and to the strengthening of citizen participation.

19. *Provision of Technical Assistance to support the establishment of Local Consultation Structure – LCS (or Structure local de concertation -SLC) of the Urban Municipality of Antananarivo (CUA).* The LCS is a forum for exchange, consultation and dialogue for promoting inclusive participation of all local stakeholders, including authorities, citizens and communities, private sector, etc. in the development of the commune. This structure is foreseen by the legislation (Law 2015-957 on decentralization), however, the establishment of such structure in urban areas has not yet been carried out. The LCS will ensure independent community monitoring and follow-up of project activities and the sustainability of the works. The LCS will be a platform that allows municipal-fokontany-community stakeholders to systematically inform, discuss and follow up on the project activities being implemented for the benefit of the target communities. An SMS and web platform will be included to provide a communication platform, monitoring mechanism, and ensure openness, accessibility and data collection from citizens in real time. This mechanism will also help to respond to questions / needs (see also Grievance redress mechanism). This activity will be led by the CUA, with the help of a dedicated consultant, as well as with technical support of the Ministry of the Interior and Decentralization (which oversees the implementation of LCS as part of the decentralization law).

20. *Development of a Stakeholder Engagement Plan (SEP) to ensure the participation and the commitment of all stakeholders of the project.* The SEP will relate to the missions, roles and involvement of M2PATE, APIPA, CUA, SAMVA, CSOs, Citizens, fokontany, etc.). This plan would be formalized through a memorandum of understanding (MOU) linking these actors and will serve as tools for implementation and monitoring of project activities. The implementation of the SEP will be monitored periodically through the PEBSP and LCS.

21. *Participatory Evaluations of Beneficiary Satisfaction on the Project (PEBSP) will be carried out every six months after an initial baseline that will be conducted at the end of year one.* These evaluations will focus on the project's actions and on the fulfillment of the commitment by project actors (see Stakeholder Engagement Plan). M2PATE should use the PEBSP as a feed-back mechanism on overall project implementation to inform any adjustments or corrections needed during subsequent phases of implementation. More specifically, satisfaction assessment will focus on actions related to the rehabilitation of the Canal C3 and the dikes within the target intervention area. It will be carried out in a participatory and independent manner and will be conducted by a third-party organization, either an NGO or a consulting firm, recruited by the project and under supervision of the LCS.

22. *Establishment of a Grievance Redress Mechanism (GRM) to address all grievances directly related to all project activities, including involuntary resettlement.* All relevant information will be recorded in a

GRM system managed by AGETIPA. In addition to the ESMF/RPF/RAP, an operational manual describing the operationalization of the GRM as well as its reporting protocols will be developed prior to project implementation. Adequate communication must be provided to ensure that the GRM is well-known among the public (coordination with the LCS will be helpful, for example). This mechanism will be managed by the M2PATE.

23. *Capacity building of local communities*. The project will also support training to local communities to reinforce the communities' preparedness and ability to deal with possible natural hazards. Specific training will be identified as the project develops.

Activity	Estimate Costing (US$)
Technical Assistance for LDC (CUA platform) and Stakeholder Engagement Plan (SEP)	150,000
Beneficiary Satisfaction Surveys (every six months)	400,000
Establishment of a Grievance Redress Mechanism	100,000
Capacity building to communities on disaster preparedness	650,000
Total sub-component 1.3	**1,300,000**

Component 2 - Strenghtening institutional capacity for resilient urban governance SDR 3.8 million (US$ 5.4 million equivalent)

24. To ensure the sustainability and scalability of interventions under this project, this component would seek to build the capacity of local authorities, service delivery agencies, and multi-stakeholder groups. The objective is to institute an integrated approach to municipal governance and urban development so as to better manage existing settlements and urban growth.

25. **Sub-component 2.1: Strengthening capacity for inclusive and resilient urban management (US$ 1.5 million)**. One of the main drivers to slum proliferation in the greater Antananarivo area, and in Madagascar in general, is the poorly functioning land and housing markets. To curb that trend, a better understanding of the reality of informal settlements will be needed, in addition to the development of novel policy instruments. This sub-component aims at:

26. *Supporting M2PATE, CUA and targeted municipalities to internalize different planning exercises.* Namely, the recommendations of the Detailed Urban Plan (prepared under Sub-component 1.2), and the GA Urban Masterplan prepared by JICA. Antananarivo suffers from the lack of proper urban planning both at the commune and Metropolitan level, to establish a broader vision of the current and future development of the city, and at the micro-level, to operationalize the vision and the broader orientations into more concrete land-use regulations, infrastructure and service delivery modalities among others.

27. This activity will support both the M2PATE and the CUA on better integrating the results of both planning exercises above mentioned, to ensure a better impact on the future development of the city. This will be done via (i) a better understanding (diagnostic) of both structure capacity to monitor and evaluate planning instruments, (ii) building institutional capacities in this area via targeted trainings, and (iii) developing a protocol for monitoring and evaluation related to urban growth.

28. *Prepare an integrated slum upgrading and affordable housing strategy for Greater Antananarivo.* This strategy, will aim at rethinking the current ways the Government of Madagascar deals with the proliferation of slums in the Greater Antananarivo area, and on modalities to halt this rapid trend in the future.

29. To be led by DGATE, this strategy will aim at reviewing diverse urban upgrading practices, and explore modalities to institutionalize some of them. It will be directly linked to and build on the macro recommendations of the Urban masterplan. This strategy will build on numerous practices led by UN agencies, bilateral donors and local and international NGOs active in the urban upgrading sector in Madagascar. On the other hand, Madagascar has never tested innovative instruments for low-income housing provision targeting the poorest. Experiences from diverse countries with similar socio-economic nature, suppose a more comprehensive approach to housing access and provision, based on auto-construction and auto-promotion modalities.

30. To ensure inclusion of all relevant stakeholders in the preparation of this key strategy, a technical working group will be set, led by the DGATE, to ensure technical soundness and inclusion of diverse institutional and beneficiaries perspectives.

31. In addition to the strategy, this activity will fund capacity building exercises to better internalize those recommendations, and ensure at diverse institutional levels proper understanding and clarity of roles and responsibilities to tackle the chronic problem of slum proliferation.

32. **Sub-component 2.2: Municipal Management (US$ 2.1 million)**. This sub-component would seek to modernize public sector management of CUA by supporting reforms that aim to (i) increase local revenue mobilization while promoting transparency and accountability; and (ii) improve human resources processes and systems.

33. ***Revenue mobilization:*** The project will provide technical assistance, consulting services, training and acquisition of materials to support activities to increase local revenue mobilization while promoting transparency and accountability. The assistance will revolve around three pillars.

34. The first pillar, *enforcement,* will aim at supporting the improvement of the database of land and property as well as the taxpayer database in the CUA. The objective is to compile and maintain a complete database of taxpayers (business and individuals), and taxable properties with a system for regular update. The support will aim at improving routine identification of taxpayers for administrative actions, government/third party data exchange and analytics.

35. The second pillar, *facilitation* will seek to lower the transaction costs associated with routine interactions between CUA government and the taxpayers, such as filing, payment, and assessment

matters. This includes exploring the implementation of solutions that have been recently considered by the CUA administration, such as tax kiosks and tax payment via mobile phones. The project will also support activities to facilitate compliance regarding registration of construction, with the aim of improving property database and valuation systems.

36. The final pillar, *trust,* will support measures and programs to strengthen individuals' and businesses tax morale, while promoting transparency and oversight of revenue mobilization and management.

37. ***Human resource (HR) management:*** At the request of the CUA, the project will provide technical assistance, consulting services, training and acquisition of material to support improvement of municipal HR management. The assistance in this area will start with an assessment of CUAs payroll, to identify opportunities to decrease personnel expenditure and ensuring the implementation of efficient payroll management routines. This assessment will be followed by assistance to redesign HR management processes including a stocktaking of current and required skills, and the redesign of processes of personnel appointment, rotation, promotion and dismissal. The assistance will also include rapid improvements in the technological basis of HR management (e.g. connection between payroll and personnel files database).

38. **Sub-component 2.3: Capacity enhancement and sector reforms for environmental sanitation (US$ 1.8 million)**. The activities under this sub-component aim to (a) ensure that the assets rehabilitated under Component 1.1 (Improvements of Canal, Drainage and Sanitation Infrastructure) are properly maintained by APIPA in order to ensure their long-term sustainability and functionality; (b) improve solid waste management through the improved collection in the designated project area, behavior change campaign, and the development of a solid waste management strategy for GA including a sanitary landfill plan; and (c) provide technical assistance to the multi-stakeholder coordination of the Integrated Urban Water Management (IUWM) Platform that will play an important role in building multi-stakeholder consensus on both drainage and solid waste management reforms.

39. Sustainability of assets. After the rehabilitation of the C3 canal, its embankments and retention ponds, as well as the rehabilitation of dikes and river embankments along the Ikopa and Sisony Rivers, proper maintenance will be required. The responsibility for this maintenance lies with APIPA which currently lacks the financial and organizational capacity to plan and implement a maintenance schedule. Although APIPA has technically qualified senior leadership, organizational constraints have limited APIPA to ad-hoc responsive maintenance activities. The agency's financial sustainability and its ability to cover its O&M costs need to be urgently addressed. Technical assistance and analyses provided under this sub-component will address financial models for ensuring the sustainability of APIPA, maintenance schedules and financing of maintenance teams for flood management assets (such as the C3 and system of dikes) and monitoring systems to better monitor the deterioration and replacement needs of the assets. These activities will be coordinated closely with other efforts financed by AFD which is financing the rehabilitation of the Andriantany Canal (parallel to the C3) and other flood management investments including technical assistance to APIPA including institutional reforms.

40. Because of the economic activities and housing that occurs near and around the flood management infrastructure, activities under this sub-component will also help APIPA coordinate with the

respective municipal authorities to educate neighboring populations on the importance of helping to protect the assets and not encroaching upon the rights-of-way.

41. Solid waste management systems. As evidenced by the drainage canals being overwhelmed in many places by solid waste, collection and disposal of solid waste are not functioning well. Proper solid waste collection requires an efficient primary collection service provider at the neighborhood level (in some neighborhoods RF2 have been organized) and good coordination between these primary collectors and the SAMVA, the waste management agency for CUA (only) which manages transfer stations and transports to the final disposal site. Technical assistance provided under this sub-component will strengthen the primary collection system by supporting the creation of RF2 or similar community-led primary collection service providers where it is lacking, and create mechanisms for a proper coordination between the primary collection service providers and the SAMVA. This effort will be complemented by a communication and behavior change campaign focused on solid waste management behavior by citizens. The campaign will include several activities such as dissemination workshops, community fora, posters, banners, brochures, mass media messaging, cleanliness competitions among neighborhoods, etc. These activities aim at informing the population of the importance of correct disposal of solid waste and the consequences of continuing to dump solid waste into canals and waterways. The aim will be to mobilize and sensitize residents to hold themselves accountable for the proper disposal of solid waste (i.e. not in the drainage canals). These activities will be coordinated by the communes and SAMVA. In addition, the preparation of a solid waste management strategy for GA will be implemented under this sub-component. The need for this strategy is reflected in the IUWM Platform strategy (see below) that represents the consultation and consensus of multiple stakeholders in Greater Antananarivo. This strategy will lay the groundwork for additional investments under Project 2 of the SoP.

42. Support for sector reforms. Given the multi-sector nature of the reforms needed to ensure the sustainability of services, this sub-component will provide support to the IUWM Platform that was officially convened by the M2PATE, the Ministry of Water, Energy and Hydrocarbons (MEEH), CUA, and other stakeholders. In its organizational and planning phase (2015-2017), this platform proved to be an important forum for bringing together the multiple actors involved in the urban water cycle. The IUWM Platform produced a strategic plan for addressing three key pillars (institutional framework and financial sustainability; sanitation and flooding; cross-cutting issues [such as inclusion, capacity building, environmental impacts] and collectively monitoring progress. The IUWM Platform can play an important role for pursuing sector reforms (institutional and financing arrangements) that are important for this SoP as well as addressing key metropolitan-wide efforts that will require consensus building (e.g., the solid waste management strategy). Under this sub-component, funding will be provided for a consultant to provide secretariat functions of the IUWM Platform to help convene and prepare meetings and workshops (two-to-three times per year) that discuss the environmental sanitation reforms, as well as workshop venues and workshop materials needed for the deliberation of the IUWM Platform. Depending on the progress and momentum generated by this multi-stakeholder platform, funding may also be provided to small technical studies (e.g., options paper for re-alignment of APIPA/SAMVA functions; analytical review of existing documents on solid waste management options; options for public communication campaigns; etc.) that would support the consensus-building process. These activities will be closely coordinated with the AFD-funded PIAA which also includes institutional reforms.

Activity	Estimate Costing (US$)
2.1 Strengthening capacity for inclusive and resilient urban management	**1,500,000**
Technical Assistance to M2PATE on inclusive and resilient urban management	500,000
Development of an integrated slum upgrading and affordable housing strategy for Greater Antananarivo	1,500,000
2.2 Municipal management	**2,160,000**
Property census (update)	850,000
Tax property software (audit, upgrade, operationalization & training)	150,000
Imagery (orthophoto imagery, vectors, integration with tax software & training)	180,000
Upgrade and roll-out of tax facilitation system (online, mobile)	300,000
Tax morale diagnostic + feedback / survey instrument	180,000
Payroll software (integration of payroll + personal files systems, operationalization & training)	200,000
Payroll audit + re-dimensioning of workforce	300,000
2.3 Capacity enhancement and sector reforms for environmental sanitation	**1,800,000**
APIPA study and canal-dike maintenance plan	325,000
TA for primary collection and coordination with SAMVA	400,000
Solid waste management strategy	500,000
Communication strategy and public education	325,000
TA to IUWM for APIPA and SAMVA reforms	250,000
Total Component 2	**5,460,000**

Component 3 - Project Management, Coordination, Monitoring and Evaluation SDR 4.5 million (US$ 6.5 million equivalent)

43. This component will finance the following activities: (i) incremental operating costs; (ii) fiduciary activities; (iii) audit, studies and assessments required under various project components; (iv) communication; and (v) monitoring (including of safeguards processes) and evaluation.

Component 4 - Contingent Emergency Response Component - CERC (US$ 0 million)

44. This component will provide immediate response to an Eligible Crisis or Emergency, as needed. This would finance emergency works in the case of another disaster event by including a "zero-dollar" Contingency Emergency Response Component (CERC). This would help recover damage to infrastructure, ensure business continuity, and enable early rehabilitation. In parallel, following an adverse event that causes a major disaster, the Government of Madagascar may request the Bank to channel resources from this component into an Immediate Response Mechanism (IRM). The IRM would enable the use of up to 5 percent of uncommitted funds from the overall IDA portfolio to respond to emergencies. This IRM has already been established for Madagascar and is now operational. Specific details around this component (including activation criteria, eligible expenditures, and specific implementation arrangements as well as required staffing for the Coordinating Authority) are defined in greater detail in the IRM Operations Manual approved in April 2017.

DETAILED PROJECT COSTS - SUMMARY TABLE

Component 1 - Improving urban drainage, services and resilience in targeted areas	
Sub-component 1.1: Improvements of Canal, Drainage and Sanitation Infrastructure	
Activity	Estimate Costing (US$)
Preparation of detailed designs, bidding documents and safeguards instruments	2,000,000
Supervision costs including implantation of safeguards measures	4,640,000
Works	22,000,000
Estimated resettlement costs including cash and in-kind compensation	8,000,000
Total sub-component 1.1	***36 640 000***
Sub-component 1.2: Neighborhood upgrading	
Activity	Estimate Costing (US$)
Preparation of the Detailed Urban Plan, engineering designs and bidding documents	1,400,000
Preparation of safeguards instruments	300,000
Supervision costs including implantation of safeguards measures	2,200,000
Works: Quick Win interventions	5,000,000
Works	10,000,000
Estimated resettlement costs including cash and in-kind compensation	1,200,00

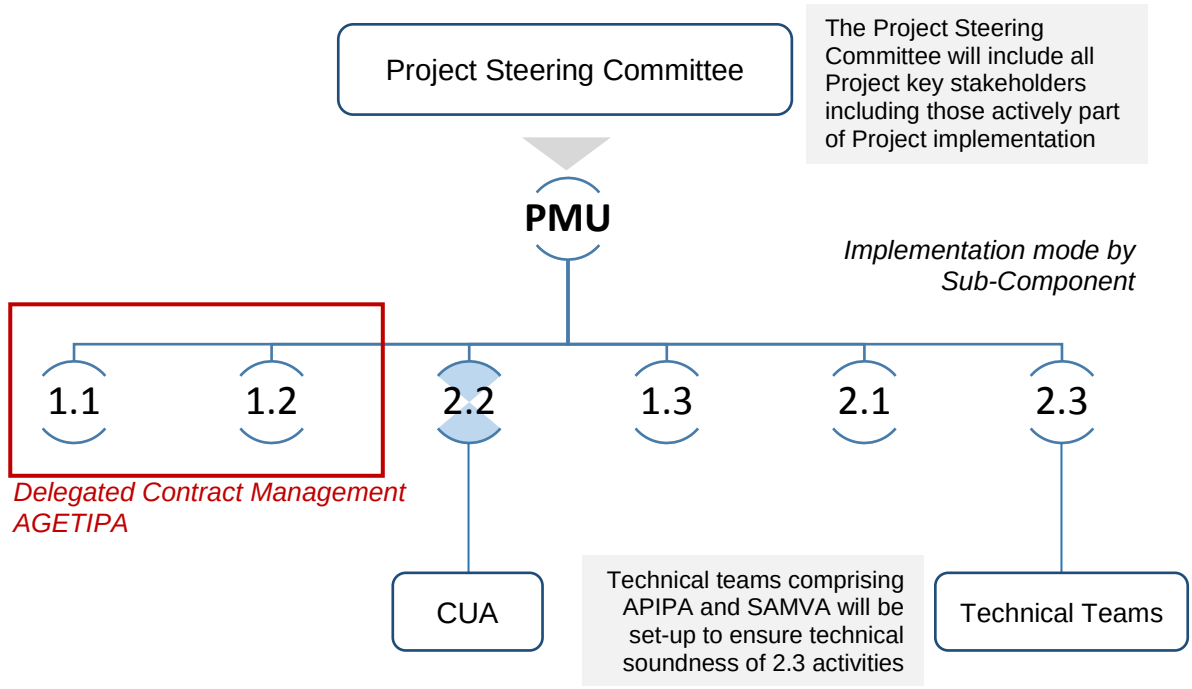
Total sub-component 1.2	***20,100,000***
Sub-component 1.3: Citizen engagement	
Activity	Estimate Costing (US$)
Technical Assistance for LDC (CUA platform) and Stakeholder Engagement Plan (SEP)	150,000
Beneficiary Satisfaction Surveys (every six months)	400,000
Establishment of a Grievance Redress Mechanism	100,000
Capacity building to communities on disaster preparedness	650,000
Total sub-component 1.3	***1,300,000***
TOTAL COMPONENT 1	***58,040,000***
Component 2 - Strenghtening institutional capacity for resilient urban governance	
Sub-component 2.1: Strengthening capacity for inclusive and resilient urban management	
Activity	Estimate Costing (US$)
Technical Assistance to M2PATE on inclusive and resilient urban management	500,000
Development of an integrated slum upgrading and affordable housing strategy for Greater Antananarivo	1,500,000
Total sub-component 2.1	***1,500,000***
Sub-component 2.2: Municipal Management	
Activity	Estimate Costing (US$)
Update Property census	850,000
Tax property software (audit, upgrade, operationalization & training)	150,000
Imagery (orthophoto imagery, vectors, integration with tax software & training)	180,000
Upgrade and roll-out of tax facilitation system (online, mobile)	300,000
Tax morale diagnostic + feedback / survey instrument	180,000
Payroll software (integration of payroll + personal files systems, operationalization & training)	200,000
Payroll audit + re-dimensioning of workforce	300,000
Total sub-component 2.2	***2,160,000***
Sub-component 2.3: Capacity Enhancement and sector reforms for environmental sanitation	
Activity	Estimate Costing (US$)
APIPA study and canal-dike maintenance plan	325,000

Technical assistance for primary collection and coordination with SAMVA	400,000
Solid Waste Management strategy	500,000
Communication and public education	325,000
Technical assistance to IUWM for APIPA and SAMVA reforms	250,000
Total sub-component 2.3	***1,800,000***
TOTAL COMPONENT 2	**5,460,000**
Component 3 - Project Management, Coordination, Monitoring and Evaluation	
Activity	Estimate Costing (US$)
Operating costs including delegated contract management; fiduciary activities; audit, monitoring and evaluation	6,500,000
TOTAL COMPONENT 3	**6,500,000**
Component 4 - Contingent Emergency Response Component	
TOTAL COMPONENT 4	**0**
Unallocated	
	5,000,000
PROJECT TOTAL COST	**75,000,000**

ANNEX 2: IMPLEMENTATION ARRANGEMENTS

COUNTRY : Madagascar
Integrated Urban Development and Resilience Project for Greater Antananarivo

Project Institutional and Implementation Arrangements



1. **Project Steering Committee.** A Project Steering Committee (PSC) was established on August 18, 2017 (through *Note Ministérielle* No. 235/2017-M2PATE/SG/DGATE/DPHLE) to provide strategic oversight of the project. It is chaired by the Directeur Général of Land Use Planning and Equipment (M2PATE) and includes representatives of the Ministries of Finance and Budget, Agriculture, Interior and Decentralization, Water-Energy-Hydrocarbons, Population, Social Protection and Women; Commune of Antananarivo, Bemasoandro, Anosizato, Andranonahoatra, District, APIPA, SAMVA, BPPAR, ONE and AGETIPA. The PSC will meet at least twice a year and will be responsible for approving the annual work plans and related budgets, project progress reports and providing policy direction. The Project Management Unit (PMU) will act as the Secretariat of the Project Steering Committee and will be responsible for preparing the meetings, preparing the documents for the meeting, and recording the minutes of the meeting.

2. **Project Management Unit.** The PMU based within the Ministry attached to the Presidency, in charge of Presidential Projects, Land Use Planning and Equipment (M2PATE) will be responsible for the

day-to-day management of the project. M2PATE would be in charge of: (i) executing the project; (ii) managing technical inputs from different line ministries, municipalities and relevant technical agencies especially the MEEH, CUA, APIPA, and SAMVA; (iii) endorsing consolidated technical and financial project reports from the implementing entity for onward transmission to the Bank; (iv) ensuring dissemination of lessons learned from the project to all participating agencies, beneficiary communities and other stakeholder institutions, as well as managing the overall project communications strategy; and (v) ensuring the proper implementation of safeguards requirements. The PMU will be composed by (i) a coordinator; (ii) an accountant; (iii) a financial management specialist; (iv) a procurement specialist; (v) an environmental safeguards specialist; (vi) a social safeguards specialist; and (vii) a monitoring and evaluation specialist.

3. **Delegated Contract Management.** M2PATE will sign a Delegated Contract Management Agreement with the AGETIPA for managing the execution of Component 1.1 and 1.2 of the Project. AGETIPA is a public works contract management agency with a long experience with urban infrastructure projects. AGETIPA will be responsible for: (i) selecting and recruiting consultants in charge of technical studies, detailed design and preparation of bidding documents; (ii) supervising the quality of studies and bidding documents; (iii) managing the bidding process and awarding contracts for works and goods; (iv) supervising contracts and approving invoices; and (v) receiving works.

4. The project will also engage in capacity building for the CUA by working with the municipality to implement recommendations from the PEFA Action Plan. A small Project Implementation Unit will be established within CUA to support the implementation of the TA activities under component 2 and support the involvement of CUA in overall project implementation. This PIU will not have any fiduciary role. The CUA will sign an MOU with the PMU, clarifying roles and responsibilities of each in the overall implementation of the Project according to the PIM, and more specifically in the implementation of sub-component 2.2 where CUA will be the technical and institutional leader. In addition, MOUs will be signed between the PMU and other institutions (i.e. APIPA, SAMVA) which will benefit from the technical assistance component. Technical Teams will be established for each key activity or sub-component to bring together technical team of respective institutions that will be involved in various aspects of project implementation, including the review of feasibility studies and engineering designs.

5. **Project Implementation Readiness.** A Project Preparation Advance (PPA) in the amount of US$ 2 million was used to carry out project preparation activities. Feasibility studies, detailed designs and bidding documents for the proposed priority drainage and flood protection works have been initiated and are expected to be finalized by project approval. As a result, it is expected that priority works could start by project effectiveness.

Financial Management

Summary

6. The M2PATE will sign a Delegated Contract Management (DCM) with AGETIPA for managing components 1.1 and 1.2 of the project. AGETIPA has acceptable FM systems including qualified staff, an adequate reporting system, FM manual of procedures, regularly audited financial statements with

unqualified audit opinion.

7. An FM assessment of the project implementing unit (PIU) under M2PATE in charge of coordinating the Project and managing Component 1.3 and 2, was carried out in October 2017. The assessment of M2PATE FM system has considered the degree to which: (a) the budgeted expenditures are realistic, prepared with due regard to relevant policies, and executed in an orderly and predictable manner; (b) reasonable records are maintained and financial reports produced and disseminated for decision-making, management and reporting; (c) adequate funds are available to finance the Project; (d) there are reasonable controls over Project funds; and (e) independent and competent audit arrangements are in place.

8. The proposed financial management and disbursements arrangements are compliant with the Financial Management Manual for the World Bank-financed Investment Operations dated March 1, 2010.

Country PFM situation and Use of Country Systems

9. The overall country fiduciary risks including fraud and corruption risks is high. The 2014 PEFA self-assessment indicates that limited progress has been made on improving the credibility of the budget. A PEFA self-assessment was carried out in 2017 covering FY2014-2016. The report reflected the impact of the political crisis on PFM reforms implementation, resulting in weaknesses of the budget reliability and the management of assets. Nevertheless, improvements were noted in various areas as the transparency of public finances, management of liabilities and reporting. The Government must continue to respond to challenges in some areas.

10. Several public entities will be stakeholders of the implementation of this project (CUA, APIPA, BPPAR, SAMVA). The system of these entities mirrors the Central level PFM system and its weaknesses result in the risk of lack of transparency and accountability in the use of public funds. Given the weaknesses in the PFM system, the project will opt for the gradual use of the country PFM systems using a risk-based approach (disbursement process, designated account opened at the Central Bank, strengthening of human resources under the M2PATE). Additional mitigation measures will be implemented including: (1) the development of a PIM which will provide clarity on roles and responsibilities as well as the process to implement and report on project activities, (2) the strengthening of the control environment including through the capacity building of the internal audit service, and monitoring and evaluation systems, and (3) the frequency of the Bank implementation support.

FM conditions

11. The overall fiduciary risk rating is assessed as Substantial and mitigation measures proposed (see FM Action Plan) will strengthen the internal control environment and maintain the continuous timeliness and reliability of information produced by the PMU and an adequate segregation of duties.

FM actions plan

Action	Responsible party	Deadline and conditionality
1- Recruitment of a Senior Internal Auditor	M2PATE	No later than 3 months after effectiveness
2- Recruitment of independent external auditor	M2PATE	No later than 3 months after effectiveness
3- Selection of an independent agent to review the compensations statement prior payment as well as the effective payment of these compensations.	M2PATE	No later than 3 months after effectiveness
4- Establish and maintain a financial management system including records, accounts and preparation of related financial statements in accordance with accounting standards acceptable to the Association.	M2PATE	No later than 3 months after effectiveness

Financial Covenants

12. The borrower shall not later than three months after the effective date establish and maintain a financial management system including records, accounts and preparation of related financial statements in accordance with accounting standards acceptable to the Bank.

13. The financial statements of the project will be audited in accordance with international auditing standards. The audited financial statements for each period shall be furnished to the Association not later than six (6) months after the end of the project fiscal year.

14. The AGETIPA will furnish annual financial statements audit report (entity report) to the Bank within six (6) months after the fiscal year end.

15. The compensations payment will be subject to a separate audit to ensure that payment have been made to the authorized PAPs. The audit will be undertaken in accordance with the RAP implementation progress. The audit report will be submitted to the Bank no later than 3 months after the payment.

Detail of financial management arrangements

16. AGETIPA has its own financial management arrangements including (i) an acceptable manual of procedures, (ii) experienced FM staff, (iii) annual financial statements regularly audited. AGETIPA will open a segregated account at an acceptable commercial bank to receive the proceeds of each financing and will report regularly to the PIU prior to the replenishment. The assessment concludes that AGETIPA has satisfactory fiduciary experiences and qualified resources for the implementation of activities of the project.

17. **Staffing and transfer of competence**. The PIU will be adequately staffed with one (1) Finance Manager and one (1) Accountant recruited on a contractual basis, in accordance with the TOR agreed with the World Bank. With the purpose of reinforcing the fiduciary capacity of the M2PATE, one (1) FM

assistant will be identified among the existing staff of the ministry to support the project implementation and will benefit from skills transfer and training on project management procedures. One (1) Internal Auditor will be recruited to reinforce the audit unit under the ministry.

18. The World Bank will provide the project's fiduciary staff with trainings on the World Bank's financial procedures at the project launching but also during the regular FM review meeting.

19. **Budgeting**. The management of M2PATE with the Coordination of the PIU will prepare the annual work plan and budget. The budget information will be prepared in line with the regular Government's annual budget preparation cycle. The budget execution will be monitored on a monthly and a quarterly basis. The budget execution report will be part of the Interim Financial Report and any variances will be explained and remedial measures indicated. The budget forecast shall be reliable and based on the best assumptions, and aligned with the work program, technical constraints and the procurement plan. Finally, the annual budget will be included in the Government's annual budget and thus, classified per the Government chart of accounts. Periodic regularization of budget execution will be performed. The procedures governing the budget preparation, execution and monitoring cycle will be developed in the project's financial and administrative procedures manual.

Funds flow and Disbursement arrangements.

20. Disbursements will be made in accordance with the *World Bank Disbursement Guidelines for Projects,* dated February, 2017. The financing proceeds will be disbursed using the disbursement methods as per disbursement and financial information letter (DFIL). One designated account (DA) denominated in US$ will be opened at the Central Bank. A secondary US$ account will be opened at an acceptable commercial bank to enable payment of eligible expenditures. Both accounts will be managed by the Project team (Joint signatories of the Coordinator and Finance Manager). The DA will receive an initial advance equivalent to four months of forecasted expenditures and will be replenished regularly through monthly Withdrawal Applications (WA) supported with Statements of Expenditures (SOEs). Direct payments may be made to service providers at the request of the Recipient.

21. Given the substantial financings that will flow through AGETIPA, the DCM will clarify the disbursement process particularly (i) the use of a segregated bank account for the management of the proceeds of the financing, (ii) the disbursement scheduling process, and (iii) the required reports for disbursement purpose. The PIM will broadly describe the disbursement process.

22. **Compensation of affected people: Disbursement arrangement.** The financial compensations will be paid with the proceeds of the project financing. The process is described below:

(i) MOIS[14] will ensure that compensations are accurately estimated by the BPPAR[15] and cleared by the CAE[16] for the identified PAPs[17].

[14] MOIS : Maîtrise d'œuvre institutionnelle et sociale
[15] BPPAR : Bureau National des Projets de Promotion de l'Aménagement des Régions
[16] CAE : Commission Administrative d'Evaluation (CAE)
[17] PAP : Personnes Affectées par le Projet

(ii) As per the existing regulation over expropriation compensation, a consignment account will be opened by the Government at the Central Bank to receive the funds dedicated to compensations.

(iii) The compensation funds will flow from the WB to the consignment account after the disbursement condition is met, including the clearance of the audited Compensations Statement.

(iv) Given the important amount dedicated to such operations and the expected compensations and the weaknesses of the country disbursement system, the following measures will be implemented to secure transfers:

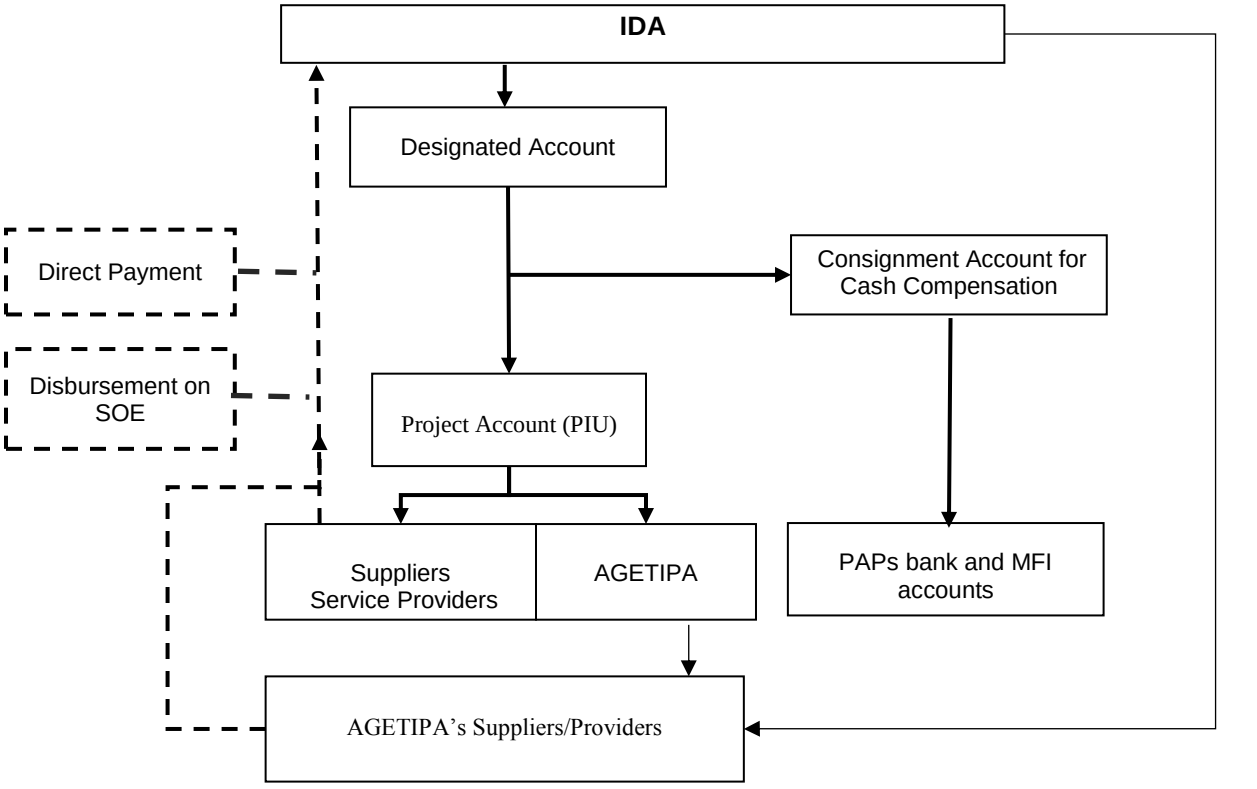
(a) The compensations statement prepared by CAE will be audited by an independent agent prior to payment:

(b) PAPs must have an account at the commercial bank or Microfinance Institutions (MFI). No cash payment will be made (irrespective of the amount involved)

(c) The compensations payment will be subject to a separate audit to ensure that payment have been made to the authorized PAPs. Based on the audit report, the consignment account balance as well as unjustified payments will be deducted from subsequent disbursements and refunded to the Bank by the end of the project.

More details will be provided in the PIM.

Funds flow



Legend	*Transfers of funds*	→
	Flow of documents	- - - →
	Payment to suppliers	→

Disbursements

23. **Disbursements by category:** The table below sets out the expenditure categories to be financed out of the Credit proceeds. This table recognizes the prevailing Country Financing Parameters for Madagascar in setting out the financing levels, which shows there will be no counterpart funds in the sense to share the project expenditure.

Category	Amount of the Credit Allocated (expressed in SDR)	Percentage of Expenditures to be Financed (inclusive of Taxes)

(1) Goods, works, non-consulting services, and consulting services for the Project, except Canal C3 rehabilitation works under Part 1.1(i) , and Cash Compensations under Parts 1.1(iv) and 1.2(iv)	32,400,000	100%
(2) Works related to Canal C3 rehabilitation under Part 1.1 (i) of the Project	10,400,000	100%
(3) Cash Compensation for Resettlement under: (a) Canal C3 works under Part 1.1 (iv) of the Project. (b) Pumping station works under Part 1.1 (iv) of the Project. (c) Urban infrastructure investments Part 1.2 (iv) of the Project.	 2,600,000 900,000 500,000	100%
(4) Refund of Preparation Advance	1,400,000	Amount payable pursuant to Section 2.07 (a) of the General Conditions
(5) Emergency Expenditures under Part 4 of the Project	0	
(6) Unallocated	3,400,000	
TOTAL AMOUNT	51,600,000	

24. **Internal controls and Internal audit**. Internal controls will comprise, but not be limited to the following: clear segregation of duties, monthly reconciliation of accounting, frequent reporting, contract management and internal audit plan. The internal controls system and procedures will be detailed in the PIM. The manual will include the controls over operations performed by AGETIPA. The '*Département de l'Audit Interne'* within the M2PATE will be involved in the review of the project activities supported by a Senior Internal Auditor to be recruited as per the TOR agreed with the Bank. The Internal audit unit will carry out a risk based audit covering project activities.

25. **Accounting and Reporting**. The project accounting system will be maintained on a modified accruals cash basis with disclosure of commitments and will comply with the Malagasy General chart of accounts (*Plan Comptable Général* 2005) which is broadly in line with the International Accounting

Standards IAS/IFRS. All information on the budget execution will be entered ex post in the Government IFMIS. To that end, the PMU will send the budget execution report to the Ministry of Finance and Budget. An accounting system will be purchased to enable the project's accounting, budget follow-up and reporting. The detailed procedures governing the budget execution report preparation and monitoring will be developed in the PIM.

26. AGETIPA has its own accounting system and will furnish periodic technical and financial reporting that will be part of the Quarterly Interim Unaudited Financial Reports (IFRs) of the whole project. The Project will submit the IFRs to the World Bank within 45 days after the end of each reporting period. The format of the IFR was agreed upon during the negotiation of the project.

27. **External financial Audit**. The external audit of the project financial statements will be carried out by the auditors appointed per TOR agreed with the World Bank. The audit will comply with the International Standards on Auditing and the audit report. In line with the new access to information policy, the project will comply with the Bank disclosure policy of audit reports (e.g. make publicly available, promptly after receipt of all final financial audit reports (including qualified audit reports). The AGETIPA will furnish the audit report of the financial statements of the association to the PMU and the Bank within 6 months after the fiscal year end.

Implementation support and Supervision plan:

28. Considering the current overall residual FM risk level, describes the supervision plan:

Action	Description	Frequency
Desk reviews	Interim financial reports review; Review of the audit report on the financial statements of the project; Review of other relevant information such as internal audit reports.	Quarterly Annually Continuous as they become available
On site visits	Review of overall operation of the FM system; Monitoring of actions taken on issues highlighted in audit reports, auditors' management letters, internal audit and other reports; Transaction review (if needed)	Twice a year As needed As needed
Capacity building support:	FM training sessions for regional and central staff provided by the Bank and regular FM meetings	During implementation and as and when needed

The FM risk assessment and mitigations measures are summarized in the table below:

Risk	Risk	Risk Mitigating Measures Incorporated into Project Design	Residual Risk
Inherent risk	H		H
Country level PFM reform is experiencing implementation delays and weaknesses identified by the PEFA 2014 in the PFM cycle generate the risk of lack of transparency and accountability in the use of public funds.	H	Implement the PFM reform agenda with the support of the World Bank and other donors (AFDB and EU). The World Bank financed project (P150116, Public Sector Services Delivery and Accountability Project) is at implementation stage and is supporting the improvement of the Madagascar public sector and PFM system	H
Entity level The M2PATE PFM system mirrors the Central level PFM system and its weaknesses resulting in the risk of lack of transparency and accountability in the use of public funds. No previous experience in financial management of IDA projects	S	Rely on independent and competent auditor opinion and consider relevant recommendations to improve internal control system Recruit one qualified Finance Manager and one Accountant to reinforce M2PATE FM team capacity. Provide appropriate training to the FM staff	S
Project level Misunderstanding of the responsibility as the project involves several stakeholders and due to the lack of experience in project implementation especially projects financed by the World Bank.	S	A PIM including FM procedures, AGETIPA contract, internal controls and a clear description of the roles and responsibilities of the various stakeholders will be developed with appropriate trainings.	S
Control Risk			**S**
Budgeting Delay in preparing annual budget and inappropriate monitoring of budget execution resulting in delay in achieving project's objectives.	S	Follow strictly budget procedures and timeline as per the PIM. Ensure that the annual work program and budget is in line with the procurement plan to prevent any delays due to the procurement process.	S
Accounting Weak capacity in the financial management of World Bank financed project which will result in delay and inaccuracies in recording financial transactions.	S	Recruit qualified FM staff. Install an adequate accounting information system that enables budget follow-up, accounting, reporting.	S
Internal Controls and Internal audit Ineffective audit function	S	Recruit one qualified Senior Internal auditor to reinforce existing team and to support the improvement of the effectiveness and efficiency of the internal control system. Design a comprehensive PIM covering FM aspects.	S

Risk of ineligible expenditures	S	Monitor the risk on non-compliance of the expenditures by using risk based approach for internal audit. Provide support and sensitize on the risk of ineligible expenditures during the World Bank supervision mission.	S
Funds Flow Risk of delay in the disbursement of the funds due to the location of the designated account at the Central Bank. Risk of delay in disbursement due to weaknesses in scheduling activities and cash flow requirements Risk of fraud over compensations payment	S	Consider the processing time as per the country disbursement system in the disbursement plan to avoid any delay in the activities implementation. Provide support to the Government to identify and mitigate the risk of the transfer of the funds to the Central Bank (dedicated unit for donors funded projects at the Central Bank). Clearly define disbursement scheduling process involving the PIU and the DCM in the PIM. Ensure compliance with disbursement schedule by submitting regularly WA. MOIS will ensure that compensations are accurately estimated by the BPPAR and cleared by the CAE for the identified PAPs. The PAPs compensations statement will be audited by an independent agent prior to payment. PAPs have/will open a commercial bank or MFI account where they will directly receive the proceeds of the compensation. An audit will be undertaken to ensure that payments were properly made to the identified beneficiaries.	S S
Financial Reporting and Monitoring Unreliable IFRs and delay in submitting the IFRs	S	Install an adequate information system at PIU level which will enable recording of FM transactions according to the chart of account consistent with applicable standards, and produce the required reports. Ensure timely collection of financial and technical reports from AGETIPA and consolidate financial data after clearance to get the IFRs of the whole project.	M
External Auditing Inadequate audit opinion	S	Recruit qualified and independent external auditor under TOR satisfactory to the World Bank. The audit will be performed per internationally recognized standards, the scope and the objectives of the audit will be tailored to the particularity of the project. Review annual audit report of financial statements of AGETIPA (entity report).	M
Fraud & Corruption Risk of fraud and corruption in the contracts management and compensations payment	S	Ensure that the grievance redress mechanism is part of the project. Ensure regular reporting from AGETIPA and SOEs reviewed by M2PATE prior any payment.	S
Overall Risk	S		S

29. **Conclusions of the FM Assessment:** The overall residual FM risk is considered **Substantial**. The

proposed financial management arrangements for this project are considered adequate subject to the implementation of the mitigation measures, and meet the Bank's minimum fiduciary requirements under Bank policy and directive.

Procurement

Procurement

30. **General.** The procurement will be carried out in compliance with the Bank's practices and cited in the project's implementation manual which will be approved by the Bank. The following guidelines in terms of procurement, consultants and fight against corruption will apply to the project: a) "guidelines on the prevention and fight against fraud and corruption in projects financed by IBRD loans and IDA credits and grants", of 15 October 2006 and revised in January 2011 (Anti-corruption guidelines); and b) 'World Bank Procurement Regulations for IPF Borrowers' dated July 1, 2016, revised in November 2017 (the Procurement Regulations).

31. Depending on the needs, the weaknesses in purchasing capacity and the lack of experience in the World Bank procedures for M2PATE PMU and AGETIPA will be mitigated by the technical support of the World Bank staff. M2PATE will globally be responsible for the procurement activities of the project as a whole. While the AGETIPA procurement team already comprises an expert in the field of procurement, the M2PATE PMU needs to recruit a Procurement TA to assist the civil servants during the first year of implementation. Evaluation of The PMU procurement capacity, including the need for and agreements in terms of training has been executed during the project preparation phase. The overall project risk for procurement is rated ***'Substantial'***. However, after mitigation measures are implemented, the residual risk would remain '***Substantial***' because the unit has not worked with World Bank procedures for a long period.

32. A procurement strategy and an 18-month initial plan procurement plan has been developed by M2PATE which will cover the procurement activities designed in the project components. Once approved by the Board, it will be published in the Ministry of finance and budget's website and on the World Bank's external website. The procurement plan will be updated in accordance with the World Bank at least once a year or whenever necessary to reflect the real needs in terms of project implementation and institutional capacity improvement. The previous exam thresholds cited in the procurement plan will be reviewed from time to time and revised throughout the project implementation if need be.

33. To determine the adequate and optimal procurement strategy for the best market response, a "Project Procurement Strategy for Development" (PPSD in English) has been prepared in order to consider, among others, the market situation, operational context, past experiences and risks. PPSD and the Procurement Plan have been prepared by the Borrower with the support of the Bank. Moreover, the Manual of Procedure will define all aspects of the procurement procedures.

34. Any contract financed by the World Bank must be detailed in the Procurement Plan which will be updated on a regular basis and approved by the World Bank. The approved Procurement Plan will be saved in the World Bank's STEP system and published in the website of the project.

35. **Goods:** Goods to be procured under the project would include: (i) equipment for the Project Management Unit at M2PATE; (ii) equipment for the CUA and SAMVA under subcomponent 2.2 and 2.3.

36. **Works:** Works to be procured under this project would include: (i) the construction of a new sludge disposal site, the rehabilitation and upgrading of the C3 Canal as well as embankments and dikes along the three main river systems (Ikopa, Mamba, Sisaony) and the pumping station; and (ii) urban upgrading investments under subcomponent 1.2.

37. **Consultant Services:** These would include: preparation of engineering designs, bidding documents, safeguards documents; works supervision services; advisory services in technical dimensions, design and implementation of institutional reforms in the areas of sanitation and municipal management, accounting; design and delivery of training, capacity building and institutional strengthening programs; advisory services on communication, stakeholder consultation and collaboration mechanisms; project related reviews and surveys, project audit and services of individual consultants to support project coordination and implementation. Short lists of consultants for services estimated to cost less than US$300,000 equivalent per contract may be composed entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines.

38. **Training:** The project will finance training programs for staff of M2PATE, CUA and other participating municipalities and agencies. The project teams at M2PATE will develop a detailed training plan which will be approved by the Bank.

39. **Procurement methods:** Procurement of works, goods and non-consulting services will be conducted using the Bank's Standard Bidding Documents (SBD) for all ICB and a Sample Bidding Document for Procurement of Works and Goods following NCB procedures for all NCB. The standard NCB provisions for Madagascar, as included in the Financing Agreement, would be applied to all the NCB contracts. The following methods will be used: International Competitive bidding (ICB), National Competitive bidding (NCB), Shopping, Selection methods for consulting firms will depend on the nature and complexity of assignments, interest to foreign firms and need for international expertise, together with the estimated budget of the services. The following methods will be used: Quality and Cost-Based Selection (QCBS), Least Cost Selection (LCS), Selection Based on Consultant's Qualification (CQS), Individual Consultants Selection (ICS) and Single-Source Selection (SSS). Short lists of consultants for services estimated to cost less than US$300,000 equivalent per contract may be composed entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines.

40. **Operational Costs:** Operating costs would include all expenses necessary to ensure proper implementation of the project, including but not limited to delegated contract management costs for AGETIPA, local travel, communication and bank charges. The quarterly budget for operating costs would be prepared by M2PATE and cleared by the Bank.

Advertising Procedures

41. General Procurement Notice (GPN), Specific Procurement Notices (SPN), Requests for Expression of Interest (EOI) and results of the evaluation and contracts award should be published in accordance with

advertising provisions in the following guidelines: "Guidelines: Procurement under IBRD Loans and IDA Grants" dated January 2011, and "Guidelines: Selection and Employment of Consultants by World Bank Borrowers" dated January 2011. The borrower will keep a list of received responses from potential bidders interested in the contracts.

Assessment of the agency's capacity to implement procurement.

42. The capacity of the PRODUIR teams at M2PATE and AGETIPA for implementation of procurement activities were assessed in September 2017 and documented in the P-RAMS. Procurement activities for the project will be carried out by the AGETIPA team under the supervision of M2PATE. AGETIPA has established acceptable internal procurement procedures that meet Bank's procurement procedures and policies. Nevertheless, performance of the delivered operations would be under observance.

43. The risks associated with procurement and the mitigation measures were identified in the assessment of the agency's procurement capacity and are summarized in the table below:

Description of Risk	Risk Rating	Mitigation Measures	Residual Risk Rating
Potential procurement delays: arrangements for clearance of evaluation reports with the AGETIPA may lead to procurement delays; Government officials from implementing partners-agencies, who would be involved in project procurement through Tender Committees may not be familiar with international procurement procedures; coordination problem.	S	(i) The Bank and M2PATE have agreed on a timeline to finalize tenders from bid document preparation to contract award. The Bank team will closely monitor adherence to the timeline; (ii) Intensive procurement training for government staff, including Tender Committee members, involved in conducting procurement; (iii) Steering Committee of key stakeholders will be established.	S
Contract administration procedures may not be adequate to ensure efficient and timely contract implementation; contract amendments not processed diligently	S	More emphasis and training on appropriate contract management; regular physical inspections and compliance checks and quality control of the deliverables by the AGETIPA team under M2PATE oversight.	S
Complaint resolution procedures not in place	S	Complaint resolution procedure to be addressed in the Project Implementation Manual	S
Perceived **level of corruption** in the country is high.	S	Enforcement of public disclosure and transparency provisions of the World Bank's Guidelines; publishing contract awards and progress reports from the implementing entities on the Ministry of Finance and Budget and external Bank websites; Close Bank implementation supervision.	S
OVERALL	**S**		**S**

Procurement Plan

44. The initial 18-month Procurement Plan was agreed between the Borrower and the Bank and finalized before negotiations. After the project is approved by the Board it would be published on the Ministry of Finance website and Bank's external website. The Procurement Plan would be updated in agreement with the Bank team at least annually or as required to reflect the actual project implementation needs and improvements in institutional capacity. The prior review thresholds set out in the Procurement Plan will be reviewed from time to time and revised as needed during the project implementation.

45. The thresholds for methods of procurement and prior review limits are detailed below.

Expenditure Category	Contract Value (US$)	Procurement Method	Bank Prior Review
Works	≥10,000,000	ICB	All the ICB contracts
	<10,000,000	ICB	None
	< 5,000,000	NCB	None
	≥10,000,000	DC	ALL
	<10,000,000	DC	None
Goods (including non-consulting services)	≥2,000,000	ICB	All the ICB contracts
	< 2,000,000	ICB	None
	<500,000	NCB	None
	≤ 100,000	Shopping	None
	>2,000,000	DC	All
	<2,000,000	DC	None
Consultant Services	>1,000,000	QCBS, LCS, CQS*, SSS	All contracts
	<1,000,000	QCBS, LCS, CQS*, SSS	None
Individual Consultants	>300,000	IC	All contracts
	<300,000	IC	None

Expenditure Category	Contract Value (US$)	Procurement Method	Bank Prior Review
Notes:	ICB – International Competitive Bidding NCB – National Competitive Bidding DC – Direct Contracting QCBS – Quality and Cost Based Selection LCS – Least Cost Selection *CQS – Selection Based on Consultants' Qualification would be followed depending on type of assignments for estimated value less than US$ 300,000 SSS – Single Source Selection IC – Individual Consultant selection procedure		

Justification of Direct contracting and Single sourcing selection should be submitted in the same time of the procurement plan within STEP

Frequency of Procurement Supervision

46. In addition to the prior review supervision to be carried out from the World Bank country office, the capacity assessment of the Implementing Agency has recommended two supervision missions per year during which ex-post reviews would be conducted on a sample basis (20 percent in terms of number of contracts) for the contracts that are not subject to the Bank's prior review. One post review report, which would include physical inspection of sample contracts, would be prepared each year. At least ten percent of the contracts would be physically inspected.

Disclosure

47. The following documents shall be disclosed on the Ministry of Finance and Budget and State Agency for Public Procurement websites: (a) procurement plan and updates; (b) invitation for bids for goods and works for all ICB and NCB contracts; (c) request for expression of interest for selection/hiring of consulting services; (d) contract awards of goods and works procured following ICB/NCB procedures; (e) list of contracts/purchase orders placed following shopping procedure on quarterly basis; (f) short list of consultants; (g) contract award of all consultancy services; (h) list of contracts following DC or CQS or SSS on a quarterly basis; and (i) action taken report on the complaints received on a quarterly basis.

48. The following details shall be sent to the Bank for publishing in the Bank's external website and UNDB: (a) invitation for bids for procurement of goods and works using ICB procedures and selected procurement irrespective of contract value; (b) request for expression of interest for consulting services with estimated cost more than US$300,000 and selected procurement irrespective of contract value; (c) contract award details of all procurement of goods and works using ICB procedure; (d) contract award details of all consultancy services with estimated cost more than US$300,000; and (e) list of contracts/purchase orders placed following SSS or CQS or DC procedures on a quarterly basis.

Environmental and Social (including safeguards)

49. **Project category**. The project is categorized as an Environmental Category A project because the potential environmental and social impacts and risks of the project while predictable could be significant, permanent and large-scale. The project will involve new land acquisition and could involuntarily displace

approximately 2,111 PAPs along the C3 canal. Transport and disposal of contaminated materials (about 100,000 m3) from dredging works could affect health and safety of workers and communities along the transport route and could pollute groundwater if the disposal site is not designed and operated properly. But over the long term, the project will contribute to environmental improvements from dredging and river works and will also decrease the risk of flooding and associated public health risks and improve living conditions in selected areas of GA.

50. **Policies triggered.** Four environmental and social Safeguard Policies have been triggered by this operation : OP 4.01 (Environmental Assessment); OP 4.12 (Involuntary Resettlement); OP 4.11 (Physical Cultural Resources); and OP 4.04 (Natural Habitats). OP 4.04 is triggered due to the potential impacts of dredging and river works on downstream river but also due to the potential long term environmental benefits of the project to the environment. Some of the activities whose sites are not yet identified (e.g., disposal site for the dredged materials) may also impact natural habitats. OP 4.11 is triggered as the ESIA identified three sites of cultural or religious significance (two churches and one cock-fighting arena) that will be affected by the C3 works. Chance finds might also be encountered during implementation.

51. The main project environmental impacts are related to the removal and disposal of close to 100,000 cubic meters of sludge from the C3 canal, under subcomponent 1.1 “Improvements of Canal, Drainage and Sanitation Infrastructure”. The main social impacts are related to permanent and temporary involuntary resettlement under subcomponent 1.1 “Improvements of Canal, Drainage and Sanitation Infrastructure” and 1.2 “Neighborhood Upgrading”. The main environmental impacts associated with these works based on the ESIA on component 1.1 activities are generation of noise, dusts and vibration; erosion on the quarry sites of rocks and earth, unpleasant smells, disposal of contaminated dredged and excavated materials, social conflict due mainly to land acquisition and resettlement process and health and safety issues for workers and the local population due to labor influx issues of temporary workers, during the civil works, around work sites, the traffic disturbance and accident traffic risks with the sludge transportation, and groundwater pollution risks with the contaminated sludge. The main mitigation measures to adress these risks are described in the ESIA/ESMP. The proposed project requires no exceptions to the World Bank’s policies on environmental and social safeguards.

52. To address these safeguard issues and meet the requirements of the policies, the Recipient has prepared: (i) an Environmental and Social Management Framework (ESMF) for the subprojects in mobility and accessibility infrastructures, sanitation and hygiene services and resilience investment whose exact locations could not be determined prior to or at project appraisal and (ii) a full Environmental and Social Impact Assessment (ESIA) with a specific ESMP for the civil works for the drainage and rehabilitation of the dikes and C3 canal. Specific mitigation for natural habitats and the PCRs to be affected by the C3 works are included in the ESMP. A separate ESIA/ESMP for the canal sludge disposal site will also be prepared as a condition of effectiveness of the credit.

53. **Environmental and Social Management Framework (ESMF):** In compliance with OP 4.01 (Environmental Assessment) since the precise locations and potential impacts of future investments in infrastructure to improve mobility and accessibility, social services and public health and hygiene, could not be identified prior to or at appraisal, an Environmental and Social Management Framework (ESMF) has been prepared to be used to screen sub-project proposals for environmental, social, gender, and health and safety impacts. The ESMF, which includes a generic Environmental and Social Management

Plan (ESMP), has taken into account the urban environmental and social review and described the environmental and social profiles in the project target area, which covers parts of the first and fourth "arrondissements" of the CUA, as well as the extension to three neighboring communes (Bemasoandro, Andranonahoatra, Anosizato Andrefana), on the potential activities to be supported by the project. The ESMF outlines an environmental and social screening process for future infrastructure investments to improve mobility and accessibility, social services and public health and hygiene investments, to ensure that they are environmentally and socially sound as well as sustainable. This approach conforms with GoM and World Bank policies and guidelines on environmental and social impact management (see the Health, Safety and Environment (HSE) guideline). The ESMF also outlines the importance of developing an operational grievance redress mechanism which will capture and address environmental, social, governance, and other grievances and negative impacts of the project. Prior to its commencement, and as soon as the implementation sites are identified, each subproject/activity will be screened per the Environmental and Sociale Screening Form (ESSF) procedures detailed in the ESMF. The screening outcomes will determine the need to prepare an Environmental and Social Impact Assessment (ESIA), and a freestanding Environmental and Social Management Plan (ESMP).

54. Since the project is rated a Category A project, all specific environmental and social ToRs for identified subprojects under Sub-component 1.2 during implementation will be submitted for the World Bank's approval before launching environmental and social studies. The works of these selected subprojects will be executed with the environmental and social clauses in the respective enterprise contracts and with the required Contractor Environmental and Social Management Plans (CESMP) included after the specific ESIAs are approved by the Bank. The screening of the sub-projects will be done by the two safeguard environmental and social focal points (one environmental specialist and one social development specialist), who will be part of the Project Management Unit. The environmental and social safeguard specialists will be responsible for the procurement of consultants to prepare the safeguards instruments, supervision of the consultants and monitoring of the implementation of the ESMPs, and RAPs in the project areas. The safeguard specialists also will ensure that all contractor contracts include environmental and social clauses (including a worker code of conduct, specific grievance redress mechanism, specific measure regarding gender-based violence) , which are attached as an annex to the ESMF and will also be developed in the specific ESIA for the selected subproct sites during implementation in order to ensure adequate environmental and social management practices during construction and operation.

55. For OP 4.11 Physical Cultural Resources: The ESIA identified three sites of cultural or religious significance (2 churches and one cock-fighting arena) that will be affected by the C3 works. Appropriate mitigation measures are included in the ESIA. In addition, the ESMF has included "chance find" procedures in case of chance finds during construction. For OP 4.04, Natural Habitats, the project aims, as one of its main objectives, to preserve natural habitat and reduce risks and impacts to preserve the natural site in the project zones. OP 4.04 has been triggered due to the potential encroachment on natural habitats by the location of the sludge disposal site which has yet to be determined (as of April 2018) but also due to potential impacts from dredging and river works on rivers during construction and the long term positive impacts of dredging in improving the water quality of the rivers.

56. **Environmental and Social Impact Assessment (ESIA):** An Environmental and Social Impact Assessment (ESIA) has been prepared for the civil works for the drainage and rehabilitation of the C3

Canal, and address, among others, the construction stage impacts mainly related to noise, vibration, erosion on the quarry sites of rocks and earths, dust, unpleasant smells, increased STD/AIDS transmission risks with the influx of temporary workers and safety issues with the important number of workers required during the civil works; health and safety issues for workers, the traffic disturbance and accident risks with the sludge transportation, groundwater pollution risks with the polluted sludge. The canal sludge lab results have noted the presence of heavy metals. In addition, the current solid waste landfill of Andralanitra will reach full capacity in less than four years and an alternative long term treatment and disposal landfill site has not yet been identified. Therefore, the project should identify a specific disposal site for the disposal of dredged and excavated material estimated to reach a volume of 100,000 cubic meters. A site-specific, full stand-alone ESIA for the sludge disposal site is required. This site-specific ESIA will include the appropriate sludge treatment technology adopted to reduce the contamination of groundwater and the impact on the environment and human contamination risks. The current ESIA has proposed coherent criteria to select the final sludge disposal site and provides overall recommendations on the Sludge Management Plan. A strong and coherent ToR for the ESIA and RAP covering the transportation, treatment and management of the final disposal site of sludge were available at the appraisal stage. The related ESIA with its ESMPs will be undertaken and prepared prior to project effectiveness. The disposal site is required to be operational before the start of sludge removal works on the C3 Canal can commence under Sub-component 1.1.

57. A cumulative impact assessment was conducted on both canal rehabilitation projects financed under IDA (C3 Canal) and AFD (Andriantany Canal) funds. The analysis of the cumulative effects of the project with the other selected projects has concluded that there is an absence of significant negative cumulative effects during the civil works. A summary of the cumulative impact is included in the ESIA. In addition, the completion of the two projects will bring positive cumulative effects for the entire urbanized floodplain of Antananarivo: improvement of the evacuation of water from the urbanized districts within the plain, suppression of unhealthy zones, etc.

58. The Environmental and Social Management Plan (ESMP) summarises all the environmental mitigation and monitoring measures, administrative procedures, as well as the institutional responsibilities that are required during both construction and operational phases in order to eliminate, mitigate, compensate or offset negative environmental and social impacts. The Contractor will be required to prepare a Contractor Environmental and Social Management Plan (CESMP) based on this ESIA/ESMP and taking into account all plans required in the ESMP: Stakeholder Engagement Plan, Hygiene Health and Security Plan, Local Labor Recruitment Plan, Traffic Management Plan, Post-construction Site Rehabilitation Plan, Plan for Management of Cultural Sites, Management Plan for Extraction of Building Materials, Solid and Liquid Waste generated by works Management Plan, Grevience Redress Mechanism, and Sludge Treatment Management Plan. The ESIA provides detail on each of these plans required CESMP and these specifications will be included in the bidding documents once the procurement package is finalized. The ESMP includes a clear and coherent implementation plan with a total budget of around US$ 200,000 financed by the Project.

59. The activities under subcomponent 1.1 “Improvements of Canal, Drainage and Sanitation Infrastructure” and 1.2 “Neighborhood Upgrading” will result in land acquisition, and permanent and temporary involuntary resettlement. Along the C3 Canal, the number of households that will be affected from the works technical footprint is expected to be 583 households. In addition, there are 509 PAPs with

small-scale, informal economic activities along the canal that may be affected from loss of access to the water, including laundry services and collection for sands from the river's sediment and selling of wood and agriculture products. A Resettlement Action Plan has been developed and consulted and was disclosed on April 5, 2018 for the resettlement impacts of the drainage and infrastructure works under subcomponent 1.1. The resettlement impacts of activities under sub-component 1.1 related to the construction of the pumping station and sludge disposal site and sub-component 1.2 "Neighborhood Upgrading" have been estimated at 505 households, but will only be known more exactly during project implementation when activities and works sites have been identified using a participatory and inclusive approach. Minimizing resettlement impacts will be one of the criteria used in selection of activities. A Resettlement Policy Framework has been developed, consulted and disclosed to guide the resettlement in this subcomponent and includes specific guidelines on screening activities for minimizing resettlement, including a negative list of activities. The total number of people affected by Involuntary Resettlement is expected to be 3,691 persons. Three resettlement sites have been identified and provided as options.

60. Sub-components 2.1, Strengthening capacity for inclusive and resilient urban management, and 2.2, Municipal Management, include Technical Assistance Activities that will lay the foundations for a more integrated approach to resettlement across the CUA through a series of studies and capacity building of M2PATE in managing involuntary resettlement of populations at risk of flooding and other disasters in precarious neighborhoods.

61. **A Resettlement Policy Framework:** In compliance with OP 4.12 (Involuntary Resettlement), since the precise locations and potential impacts of future subprojects, mainly the subcomponent 1.2 of the project, in terms of infrastructure investments to improve mobility and accessibility, social services and public health and hygiene, investments could not be identified prior to appraisal, an RPF has been developed that takes into account the urban and socio-economic context of the resettlement. Indeed under Component 1.2, interventions related to the rehabilitation and development of precarious and vulnerable areas (urban upgrading), will affect various elements of the urban environment and are likely to generate land acquisitions that would result in loss of land, property, assets and/or socio-economic activities among the affected communities, including their possible involuntary resettlement. Therefore the RPF has identified a global number of affected households and PAPs for all the project, (i) described the way for the development of potential RAP to be developed after identification of specific activities of the project, (ii) outlined eligibility criteria for PAPs, (iii) defined a specific compensation matrix for the project, (iv) outlined a consultation process for future RAPs, (v) defined the grievance redress mechanism (GRM) which will be developed under the project and which will capture all complaints related to the project but not only those from resettlement issues, and (vi) has proposed the institutional arrangement for resetlement implementation and also defines the M&E approach for resettlement.

62. **Resettlement Action Plan (RAP):** In compliance with OP 4.12 (Involuntary Resettlement) a Resettlement Action Plan has been developed to address all aspect related to land acquisition temporary or permanent involuntary resettlement, or loss of livelihoods during the drainage and rehabilitation of the C3 Canal. The RAP has identified all households, enterprise, infrastructures and also PAPs directly or indirectly impacted by the project, and also outlines variable compensation and resettlement support which fits households and PAPs categorization, and without excluding informal settlers . The RAP also identified three resettlement sites, located in Anosiala, Andavamamba and Soavimasoandro, which are all on government land. For Andavamamba and Soavimasoandro, located in humid areas in the center

and on the outskirts of the city, technical studies for flood risk reduction will be included in the site development studies. Thus, installation of drainage will be required, flood protection infrastructures with landfilling areas before the installation of roads, basic urban services and construction of houses. In Anosiala, located outside the city, in addition to the overall development of the site, public facilities will be installed and renovated to accommodate resettled populations. Andavamamba site will be subject to an ESIA, while ESMP and a RAP are needed for Anosiala and Soavimasoandro. All sites must be operational before the start of works affecting involuntary resettlement on the C3 Canal commence under Sub-component 1.1. The RAP also defines a general grievance redress mechanism (GRM) which will capture all complaints related to the project including those from resettlement issues. The RAP includes a clear and coherent implementation plan, including an institutional arrangment with a total budget of around US$7,600,000 which will be co-financed by the government and the project. However, because of the weak budgetary position of government and the importance of not letting resettlement costs impede the progress of this project, approval for using IDA resources to finance cash compensation options, up to US$5.93 million, has been requested and obtained.

63. **Institutional arrangement:** The ESMF and the RPF include institutional arrangements outlining the roles and responsibilities for the various stakeholder groups involved, for screening and approval of activities, as well as implementation and monitoring of their mitigation measures. **Staffing**. The PMU will be adequately staffed with one (1) full time environmental specialist and one (1) full time social development specialist to ensure day-to-day safeguard works and to assess project activities in compliance with the prepared Safeguard documents approved by the Bank, in accordance with the TOR agreed with the World Bank. The Bank's safeguard team will ensure additional capacity building support to strengthen the technical capacity on both social and environmental safeguards management. The environmental and social safeguard specialists of PRODUIR will work collaboratively with the National Office of Environment (ONE), the national authority responsible for environmental and social management and also ensure compliance with national regulation and safeguards document reviews. The ESMF has proposed thematic training sessions to main actors involved in the PRODUIR. The safeguards training workshops will be iterative and open to other key stakeholders including beneficiary communities, private sector (consultant firms, CSOs, etc.) with the aim of reinforcing the grounding of public consultation and participation to foster more engagement, and the ownership and social accountability for the sustainability of project implemented activities. An Environmental and Social Panel will be hired by the PMU to support and advise the project to implement safeguard measures and requirement following a ToR approved by the World Bank.

Monitoring and Evaluation

64. **The Project Management Unit (PMU) will oversee the monitoring and evaluation (M&E) aspects related to the project.** AGETIPA will support the PMU on M&E for the entire duration of project implementation and will work closely with PMU staff on updating project indicators. The results framework described in Section VII provides the key indicators, targets, and data collection arrangements. The project will use a web-enabled management information system to manage information and report progress. The database will be available on an open-access basis, to support greater transparency, collaboration and improved project governance.

65. **Social and Environmental Monitoring will include:** (i) monitoring compliance with the Malagasy national environmental regulations; social and environmental safeguards policies and environmental and social assessment provisions; and (ii) overall monitoring and oversight of social and environmental issues at project levels. Specific attention will be devoted to monitoring and evaluating the project's gender aspects.

66. **Regular Quality Supervision and Certification:** this will be carried out by the PMU. Detailed quality guidelines will be developed by the PMU and adopted by all implementing units during project implementation.

67. **Physical Progress Monitoring and Audits** - Physical progress monitoring will be carried out monthly by AGETIPA and reported to the PMU which, in turn, will share the reports on a quarterly basis with the World Bank. Financial progress will be reported through the quarterly Interim Financial Reports (IFRs).

68. A baseline survey was prepared during project preparation. The data are disaggregated by sex, age cohort, and income levels to better determine the impact of the distribution of benefits on community members throughout the project lifecycle. A mid-term review (MTR) report of the project will be prepared and provided to the Bank before December 31, 2020, and an Implementation Completion Report (ICR) upon project completion.

Role of Partners

69. PRODUIR will provide one important contribution to a much larger metropolitan effort being coordinated by the Government. The rapid urbanization of the capital requires an increasingly more metropolitan effort (rather than only focusing on the CUA) which reflects the current set of complementary efforts. AFD is financing two important operations: *Lalankely* 3 is focused on urban upgrading of 75 neighborhoods (*fokontany*) in 25 different communes of the GA area. Deliberate efforts have been made during the design of Lalankely 3 to focus on geographic areas outside of the PRODUIR target area in order to complement both AFD and IDA investments. The second operation, PIAA, is financing the drainage and sanitation master plan for Greater Antananarivo (co-financed by EU) and will finance priority sanitation infrastructure works (sewerage and drainage). AFD and Bank teams, under the guidance of the M2PATE, have been working closely to identify the first set of priority works for PRODUIR that complement the works being identified by the PIAA pre-feasibility studies to ensure maximum complementarity. The finished sanitation master plan, expected in mid-2018, will also provide valuable guidance for additional sanitation and drainage investments that would be undertaken by the second project in the SoP.

70. Separately, JICA is financing the urban land use master plan (PUDi) for Greater Antananarivo which will guide the development of the metropolitan area for the next 15 years.

71. EIB is financing the rehabilitation of some of the dike and river embankment infrastructure that was damaged by recent floods. These investments have been coordinated with the flood protection investments identified under this project for maximum complementarity. In addition, several other initiatives are taking place by NGOs that are piloting urban upgrading initiatives in different informal settlements, resilience capacity building, fecal sludge treatment in informal settlements, and others.

ANNEX 3: IMPLEMENTATION SUPPORT PLAN

COUNTRY : Madagascar
Integrated Urban Development and Resilience Project for Greater Antananarivo

Strategy and Approach for Implementation Support

1. An implementation support plan (ISP) has been prepared to ensure timely and effective project implementation. The goal is to ensure that implementation support activities provide effective mitigating measures against the Project's key risks and increase the likelihood of achieving the expected results.

2. The ISP focuses on the key implementation risks identified in the risk assessment and describes actions to mitigate them. The ISP also includes a detailed schedule summarizing the planned implementation support missions, collaboration with other development partners (DPs), and the required human and financial resource commitment by the World Bank needed to ensure effective and successful implementation of the Project.

Implementation Support Plan and Resource Requirements

3. The ISP approach entails close monitoring of the Project's technical design and implementation aspects, governance, fiduciary, and safeguards issues. Given the overall design and scope of the project, a multi-disciplinary team comprised of technical specialists, along with fiduciary, environmental and social, and operations specialists will be needed to support the Government of Madagascar in implementing the Project. A number of technical specialists are based in the Africa Region and country office. This will facilitate overall implementation and timely communication with the client and the various stakeholders involved in implementation and allow for timely follow-up on specific issues and/or areas of concern when needed.

4. One challenge will be to coordinate the actions agreed in the ISP with operational activities on the ground, ensuring that information flows effectively and on a timely basis between all the project implementing entities. Critical to the Bank's effective implementation support will be its coordination and timing, aligned with key stakeholders/points in the planning and implementation of project activities.

5. **Implementation.** To ensure that project resources are being used effectively in pursuit of achievement of the PDO, the World Bank will undertake biannual implementation support missions. In addition, a mid-term review (MTR) of the Project is envisaged. The Bank team will include staff from the SURR and Water Global Practices as well as staff for financial management, procurement and environmental and social safeguards. Other Bank specialists will be included as needed. The skill sets represented by the core staff cover the range of issues being addressed under the Project, namely integrated urban development, neighborhood upgrading, disaster risk resilience capacity, urban flooding, sanitation and solid waste management, municipal governance, etc. Presently the co-TTLs are based in country offices and can therefore more readily support the clients as needed. The first implementation support mission will take place as soon as possible after effectiveness to provide direct and timely

feedback on the quality of implementation plans and their likely soundness and acceptability. The first mission is expected to include all team members (i.e., technical, environmental, social, fiduciary and operational specialists). Subsequent implementation support will focus on verification/M&E skills and technical implementation expertise, per the actual needs as specified in the ISP.

6. **Technical.** A number of potential risks have been identified in the design of the Project, among them are the challenges associated with the flood management works along the C3 canal and the dikes along the Ikopa River (Subcomponent 1.1). Because of the failing state of the existing flood management infrastructure, the lack of maintenance of the assets, the informal urban growth along the canal and river, and the involvement of multiple layers of government administration, the implementation of rehabilitation works is expected to be complex. Robust safeguards instruments are being designed but implementation is expected to be difficult considering the settlement patterns and the dynamic nature of the local urban economy. Subcomponent 1.2, Neighborhood Upgrading, will provide mechanisms for more integrated urban development of socially marginalized neighborhoods that are the most likely to settle close to the canal and along the riverbanks. Coordination across communes, central government agencies, and local communities will be a key factor to minimize, if not completely mitigate, these technical risks. The Bank team will ensure the availability of the appropriate technical skills mix and experience to support and guide project implementation.

7. **Political and Governance.** Political and governance risks are considered to be substantial, especially as Madagascar prepares for its next presidential election (November 2018). The coordination across levels of government (central and commune) are vital for the implementation of the project and support for this coordination to ensure that all parties remained engaged during project implementation will be monitored during the biannual implementation support missions. The functioning of the Project Steering Committee which is representative of the different levels of government will be a key mechanism for supporting this coordination.

8. **M&E.** The World Bank will complement the Project's M&E activities by carrying out biannual implementation support missions during which performance indicators will be closely monitored. Field visits will be undertaken to verify data in M&E reports and to ensure that the M&E system is generating a complete and accurate picture of project performance.

9. **Environmental and social safeguards.** Potential risks may include negative impacts on the environment with regards to the rehabilitation of the canal that will require dredging and safe disposal of accumulated canal sludge (sediment, domestic solid waste, and additional unforeseen industrial waste that may contain high pathogen levels). Human populations living in the Project target areas are expected to be affected by involuntary resettlement, both temporary and permanent. An ESMF and RPF for the Project have been developed and disclosed. An ESIA and RAP for the drainage works have also been developed and disclosed. Implementation of these safeguards instruments will require rigorous screening of the project target areas and close follow up on the related implementation issues. The Bank's safeguards team will consist of the Environmental and Social Safeguards specialists who will be core members of the bi-annual support missions. They will guide the project team and client in applying the agreed upon safeguards instruments and ensure compliance.

10. **Fiduciary.** Financial management risk has been assessed as "substantial". Procurement capacity risk has also been assessed as "substantial". Proposed mitigation measures for both FM and procurement are detailed in Annex 2. As part of its bi-annual implementation support missions, the World Bank's FM and Procurement Specialists will conduct reviews to ensure the adequacy of systems and capacity over the course of project implementation, provide advice and guidance on related issues, and recommend/arrange for training and capacity strengthening when needed.

Implementation support and Supervision plan:

Action	Description	Frequency
Desk reviews	Interim financial reports review;	Quarterly
	Review of the audit report on the financial statements of the project;	Annually
	Review of other relevant information such as internal audit reports.	Continuous as they become available
On site visits	Review of overall operation of the FM system;	Twice a year
	Monitoring of actions taken on issues highlighted in audit reports, auditors' management letters, internal audit and other reports,	As needed
	Transaction review (if needed)	As needed
Capacity building support:	FM training sessions for regional and central staff provided by the Bank and regular FM meetings	During implementation and as and when needed

Time	Focus	Skills Needed	Resource Estimate	Partner Role
First twelve months	• Project effectiveness and implementation start-up • Finalization of PIM • Implementation support • Review of progress made in year 1	• Urban Development Specialist • Disaster Risk Management and Resilience Specialist • Urban flood Engineer • Sanitation Specialist • Solid Waste Management Specialist • Municipal Governance Specialist • Social safeguards Specialist • Resettlement Specialist • Procurement Specialist • Environmental Safeguards Specialists • Finance/Disbursement • Operations • Project Administrative Support	US$150,000	AFD to coordinate the launch of its works on drainage infrastructure and neighborhood upgrading
12-48 months	• Implementation of planned activities/review of annual work plans and budgets, and cross-checking linkages between planning, budgeting, and results • Conducting of ISM missions	Same as above	US$150,000	AFD to coordinate the continued implementation and lessons learned of its drainage infrastructure and neighborhood upgrading JICA investments?

	• Monitoring, evaluation of ongoing activities • Assessment of implementation of safeguards instruments • MTR conducted in year three
48-60 months	• Implementation of planned activities/review of annual work plans and budgets, and cross-checking linkages between planning, budgeting, and results • Monitoring, evaluation of ongoing activities • Assessment of implementation of safeguards instruments • Implementation Completion and Results Report after project end

Skills Mix Required

Skills Needed	Number of Staff Weeks	Number of Trips	Comments
Task Team Leader (Senior Urban Specialist)	12	3	Maputo-based
Co-Task Team Leader (Lead/Senior Water and Sanitation Specialist)	12	3	Nairobi-based
Senior Water & Sanitation Specialist	4	2	Niamey-based
Senior Urban	8	2	HQ-based

Development Specialist			
Senior Infrastructure Specialist	8	2	HQ-based
Solid Waste Management (Senior Urban Specialist)	2	1	HQ-based
Urban Specialist	20	-	CO-based
Social Development Specialist	8	-	CO-based
Municipal Governance (Public Sector Specialist)	8	-	CO-based
Procurement Specialist	6	-	CO-based
FM Specialist	6	-	CO-based
Social Development Specialist (Safeguards)	6	2	HQ-based
Environmental Specialist (Safeguards)	6	-	CO-based
Legal	2	As required	HQ-based
Disbursement	2	As required	Nairobi-based
Project Administrative Support	8	-	CO-based

Partners

Name	Institution/Country	Role
Bertrand Ficini	AFD/Madagascar	Deputy Director
Julien Blanc	AFD/France	Project Manager (PIAA)
Alix Françoise	AFD/France	Project Manager (Lalankely III)
Yohei FUNAKOSHI	JICA/Madagascar	Director of Programs
Frédéric Fourtune	UE/Madagascar	Infrastructure Program Manager

ANNEX 4: ECONOMIC ANALYSIS

COUNTRY : Madagascar
Integrated Urban Development and Resilience Project for Greater Antananarivo

Summary

1. The economic analysis was conducted using a range of data and analyses, including (i) the development of economic impact models that use the results of a recent household survey of the urban Antananarivo and surrounding areas conducted by the Social, Urban and Resilience Global Practice[18]; (ii) detailed flood modelling as part of the feasibility study of a selection of the planned activities under Component 1; and (iii) additional large-scale flood impact modelling for the target area.

2. The project investment amounts to a total of US$75 million[19]. Important returns are expected to benefit the residents of Antananarivo, about 650,000 people, who live in an area prone to chronic flooding during the rainy season. The intervention is expected to reduce significantly the exposure of a total area of 15.9 square kilometers, including at least 14,745 buildings[20], to 10-year and probably 20-year return period flooding, lowering property damages and the health-risks associated with stagnant and contaminated water, particularly for the poor. Urban upgrading investments, to be selected during the project, would enhance those benefits for the entire population through the provision of mobility and accessibility infrastructure and the provision of social services. Capacity building, and institutional strengthening would develop key agencies and municipality management capacity and augment the sustainability of the benefits in the long-term.

3. The net present value of the impact of the project is estimated at US$ 24.8 million, i.e. a benefit-cost ratio of 1.38 at a discount rate of 5 percent (Table 1). At this discount rate, the direct benefits of flood risk reduction amount to 16 percent of the total impact when assuming the new infrastructure would withstand a 20-year return period flood. The overall success of the project, however, lies in its ability to transform one of Antananarivo's most problematic slum areas into a healthier, safer environment more conducive to growth. The potential impact on benefits to the livelihoods of households living in poverty amounts to US$ 32.4 million at a 5 percent discount rate (Table 2). The projects' economic rate of return with those benefits is estimated at 9.8 percent.

4. The potential capacity of development of the area is measured through the potential appreciation of the property assets based on the property values observed in non-risky neighborhoods.[21] A large portion of the dwellings in the area being rented (40 percent) or occupied for free (16 percent), the project would likely also benefit parties outside the areas, including large estate companies. Nevertheless, the residents of the area would benefit of 44 percent of the expected real estate asset appreciation. Although

[18] Greater Antananarivo: urban poverty and resilience study (Homman et al. 2017)
[19] The project is for US$75 million of which US$5 million for project management, coordination, monitoring and evaluation is not included in the economic appraisal.
[20] Estimate made by a local contractor (BRLI) based on satellite image. Based on the enumeration done in the area for the households' survey for the WB urban poverty and resilience study, this figure could be higher. Two scenarios (with this and a higher number of buildings) were consequently analyzed.
[21] Non-risky neighborhoods as defined by Hommann et al. 2017.

better-off households would benefit most, poor home owners (applicable to approximately 34 percent of the poor population of the area) would capture 39 percent of those gains. Policies supporting poor households to regularize their title deed would increment those benefits since an estimated 29 percent of the dwellings owned by poor owners do not have regular title.

5. Improved health and easier access to safe drinking water would reduce poverty and inequity. Three quarters of the health gains from improved sanitation, equivalent to about US$ 13.6 million, come from averted diseases by poor children aged 0 to 5 years living today in front of non-functioning drains. Reducing barriers to water collection would improve the livelihood of 45 percent of the poor population of the area with currently sub-optimal water consumption.

6. The nature of investments for urban upgrading is not yet determined as it will be identified based on the participatory preparation of the Detailed Urban Plan for the intervention area. They would possibly include investments in mobility and safety and accessibility infrastructure such as roads, foot-paths, and street lighting and, in social services such as health centers, schools, community development spaces, and public spaces. The resulting amount of operating and maintenance costs could not be factored in. The larger the funding of the subcomponent and the greater the demand for public services, the higher these costs will be. Health clinics or schools, moreover, require staffing, equipment, consumables etc. unlikely to be covered with users' fees. The investments in governance and resource management in component 3 would contribute to keep these additional costs controlled and reduce their fiscal opportunity costs.

Table 1: Summary table of estimated cost-benefit analysis results based on the information currently available. Benefits are quantified over a 30-year project lifetime

Effect	**Mechanisms**	US$ million *discount rate*	
		5%[c]	***15%***
Project costs	Investment	63.6	54.0
	Operating costs and maintenance	1.6	0.7
Present costs		**65.2**	**54.7**
Demand in labor, goods and services	Investment Institution, capacity Implementation	30.7	25.6
Flood resilience	Reduced damages to properties	10.4[a]	3.9
Economic Development and improved environment	Property value	49.0[a]	14.2
Present benefits		**90.0**	**43.7**
Net present value (NPV)		24.8	-11.0
B/C ratio		1.38	0.80
Economic rate of return		**9.8%**	

Notes: [a]) based on conservative estimate of property assets of 14745 residential and

commercial and public buildings equivalent to US$343 million (about 3.4 percent of GDP) [b])
based on a population of 750,000 inhabitants [c]) EU social discount rate, 2014[22]

Aggregate impact on income and consumption

7. The project will bring a significant amount of resources to the country. Investment expenditures, institutional strengthening activities and management and evaluation tasks as well will mainly result in domestic spending, hence higher population income and consumption, by a proportion of 65 percent given the share of imports in national expenditures of 35 percent in 2016[23]. If 20 percent of the project is directly used for external spending (consultancy etc.), the project would result in an additional national spending of about US$ 36.6 million i.e. over 5 years, an annual increment of 0.1 percent in the country national expenditure.

8. As the project is being financed with an IDA credit and given Madagascar's public finance constraints, the opportunity cost of the resources for the country is likely low and not taken into account in the analysis.

9. At this stage there is, moreover, not enough information to evaluate the spending in operations and maintenance the project would induce nor the revenues from users' fees that public services could collect afterward. Operation costs and maintenance were estimated to represent 0.16 percent of the amount invested in component 1. The expected savings in public finance for repair and remediation of flood damages should, however, far outweigh the likely net increase in public current expenditures.

Employment

10. Canalization and drainage works as well as road rehabilitation will boost local employment in the targeted area. Labor intensive construction techniques and local hiring will help build project ownership and engagement around project objectives. The direct impact on generation of income from the short-term increase in demand for labor is already counted in the overall macroeconomic impact. The hiring of local unskilled labor force would, however, produce positive economic returns because poverty rate and under-employment rates in the area are high and work experience is conducive to higher income[24,25].

Targeted area

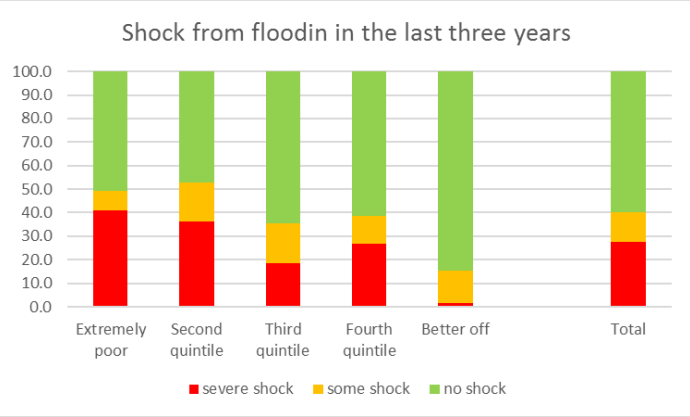
11. The targeted area is located on low lands close to the core of the city of Antananarivo. About 650,000 inhabitants, about one third of the total population of the area of Antananarivo of 2.3 million, live in this part (62 percent within a radius of less than 5 km from the city core and, 38 percent between

[22] Guide to Cost-Benefit Analysis of Investment Projects, European Commission, December 2014
[23] Data from database: World Development Indicators visited on 10/12/2017
[24] Roubaud (2009) measures a marginal return on potential experience on hourly earnings of 2.4 percent in the informal sector; Education and earnings in urban west Africa, Journal of Comparative Economics, 37 491–515.
[25] No information was available to estimate the volume of labor the project could require from the neighborhood

5 to 10 km of the city core). The population is relatively younger that in other neighborhoods: 35 percent of the household heads were 35 years old or less in 2016 (against 30 percent in other areas). The high share of women household heads (21 percent) is not peculiar but the latter are more likely salaried than in other areas. The problem of underemployment that affects large sectors of the population of Antananarivo touches also 36 percent of the heads of households of the area (30 percent of those of 35 years old or less).

12. The population in the target area is dense, resulting from several decades of migration. In 2016, 40 percent of the households had moved there in the last five years (against 30 percent in flood prone areas outside the targeted area). Richer households clearly prefer to choose non-risky areas[26], though the proximity to the city core explains that higher class people also live in the neighborhood. All the paddy fields have not disappeared yet, which suggests that the density in some parts is even greater than it appears on average (47,319 inhabitants per square kilometer).

13. The area includes high pockets of poverty: Four persons in five live with less than US$ 1.9 per day and 29 percent of the extremely poor people of the city [27] live there. The proportion of household heads who cannot read or write or calculate is also higher than in the rest of the city (18 percent against 13 percent). The highest exposure to floods of the sector worsens the already harsh living conditions observed in most of the neighborhoods of Antananarivo: 40 percent of the households (against 16 percent in other low-land areas) report having been affected by flooding events in the last three years; among them the poorest households were largely the most severely affected (69 percent of households severely affected belong to the two poorest groups).



14. Infrastructure development has not kept pace with population growth and dysfunctional urban systems and the inability of multiple agencies and levels of government to coordinate on strategic urban management, infrastructure maintenance, and service provision has generated substantial public health problems. The sewage system is very limited. About one third of the population use public toilets (or other means) and 52 percent use simple pits. Septic tanks are used only by 15 percent of the population. As in the other parts of the city, most pits are just left and covered (53 percent) or emptied into nature with

[26] See analysis on household's location (WB, 2017).
[27] First quintile of consumption per capita including rent.

the consequent risks, elevated in time of flooding, of spreading diseases as they leak into surrounding water ponds and paddy fields. Garbage collection is also largely insufficient. Although the waste of 80 percent of the population is thrown in public bins the latter regularly overflow[28] into streets and canals: "The mounts of garbage accumulating in these canals, especially in informal settlements, is staggering"[29]. Repeated floods and permanent unsanitary conditions have created a public health nightmare in these neighborhoods, which have been in the past and more recently one of the foci of the bubonic plague outbreaks.[30]

15. Consequently, beyond contributing to improve the capacity of Antananarivo to become a resilient metropolitan area to natural disaster, the intervention will have a structural impact on people's daily living conditions.

Direct benefits of flood prevention

16. Public infrastructure investments for flood mitigation and drainage improvements are public goods. The project directly won't generate revenues. The typical approach to assessing the economic efficiency of risk reduction measures is based on the cost of average expected annual flood damage in housing and economic activities. The analysis presented below combines knowledge about the frequency of intensity of flood events in the area using a general spatially explicit flood risk modeling approach combining spatial data that describes the hazard, exposure and vulnerability[31] of properties in the project area.

17. Dwellings in the targeted area are exiguous and often precarious: 40 percent of the population lives in one room of 17 squared meter with on average three other people[32]; 19 percent of the dwellings look worse than average homes. One consequence, is that 37 percent of households cook outside, a difficult activity during the rainy season and increasing the risk of foodborne diseases.

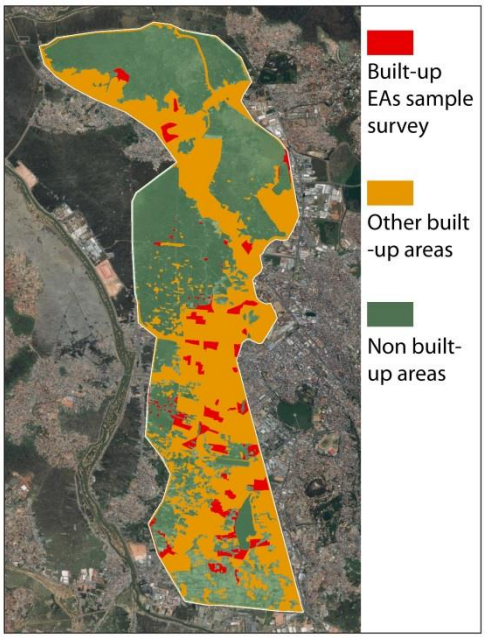
18. The average price per square meter is, however, relatively high because of the proximity to the city core. The more expensive places are those not vulnerable to flooding and within a radius of 5 km of the city core (MGA/m2 51). The second most expensive prices are observed in the places vulnerable to flooding in the same radius (MGA/m2 47) in and out the targeted area. In more distant places within a radius between 5 and 10 km from the city core, the price per square meter ranges between Malagasy Ariary (MGA) 41 and 43 per square meter (including in the targeted area).

[28] 22 percent of the households against 9 percent in other risky-areas mention that garbage was accumulated outside their bin
[29] WB, 2017.
[30] Razafindrakoto (2014); recently in the Cité 67ha and Antohomadinika, *http://laverite.mg/societe/item/4673-epid percentC3 percentA9mie-de-peste-25-d percentC3 percentA9c percentC3 percentA8s-et-141-cas-suspects.html*
[31] Reference
[32] 75 percent have windows not covered with glass but this look like rather common (66 percent in other places)

Data

19. In this assessment, hazard data – the flood depth – was derived from SSBN flood inundation data that was made available for Madagascar[33]. Exposure was estimated combining spatially referenced data from the household survey that was conducted for the Greater Antananarivo resilience study[34] with land use information[35] in the project area. The density of buildings, density of dwellings, number of floors and people is extrapolated from sampled enumeration areas for the household survey (red areas in Figure 1) to neighboring built-up areas (Yellow areas in Figure 1). Areas that are not built-up are excluded from this extrapolation procedure and from the flood risk reduction analysis in general.

Figure 1: Extrapolation of household survey information over the area targeted by the project. Household surveys and buildings and dwellings listings were conducted in a sample of the enumaration areas (EAs), the red areas on the map. Yellow areas signify other built-up EAs.



20. The procedure of extrapolation has yielded a dataset that describes exposure of assets in built-up areas in EAs in the project area using variables density of buildings, density of dwellings, share residential/commercial, mean number of floors, density of population, property values per hectare.

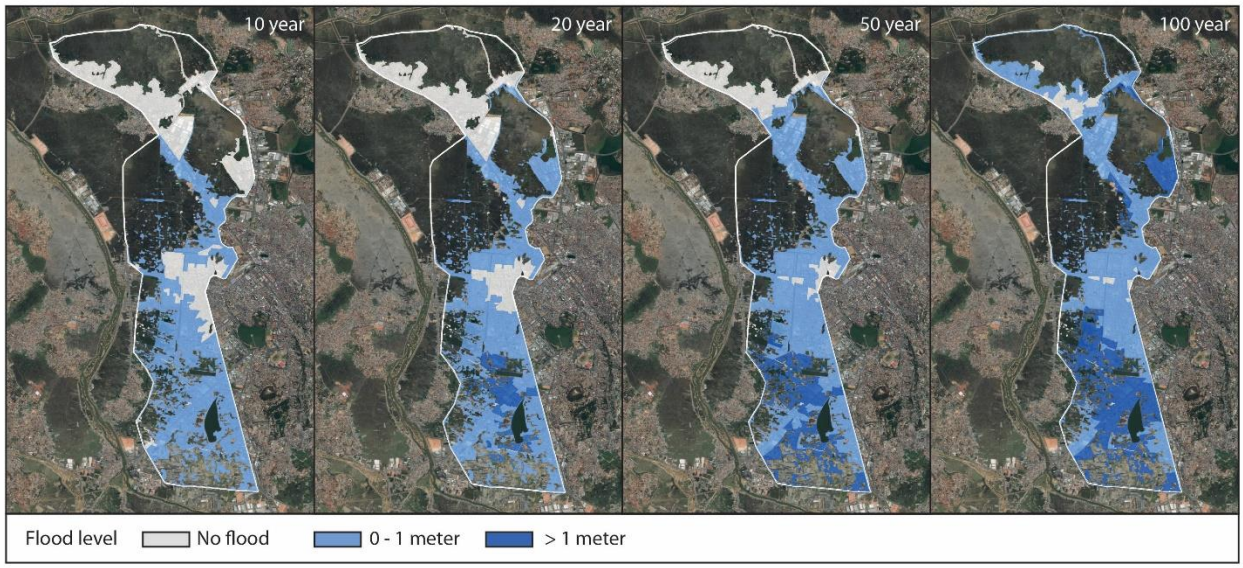
21. To assess the impact of the flood on properties in the project area, global depth-damage functions were applied prepared by the European Union's Joint Research Centre (JRC)[36]. Based on empirical studies, they have constructed generic flood depth-damage functions for each country. Depth-damage functions relate the depth of the flood to the relative damage to a property.

Results

22. Figure 2 shows the flood depth in built-up areas in the project area during a 10, 20, 50 and 100 year return time flood. In the more elevated white areas there is no flooding. Light blue areas witness a flood between 0 and 1 meter, whereas in dark blue areas the flood depth is more than 1 meter. Most non-built up areas will also flood during 10-100 year return time floods, but these areas are excluded from the analysis. The flood depths shown in Figure 2 signify the mean depth per EA.

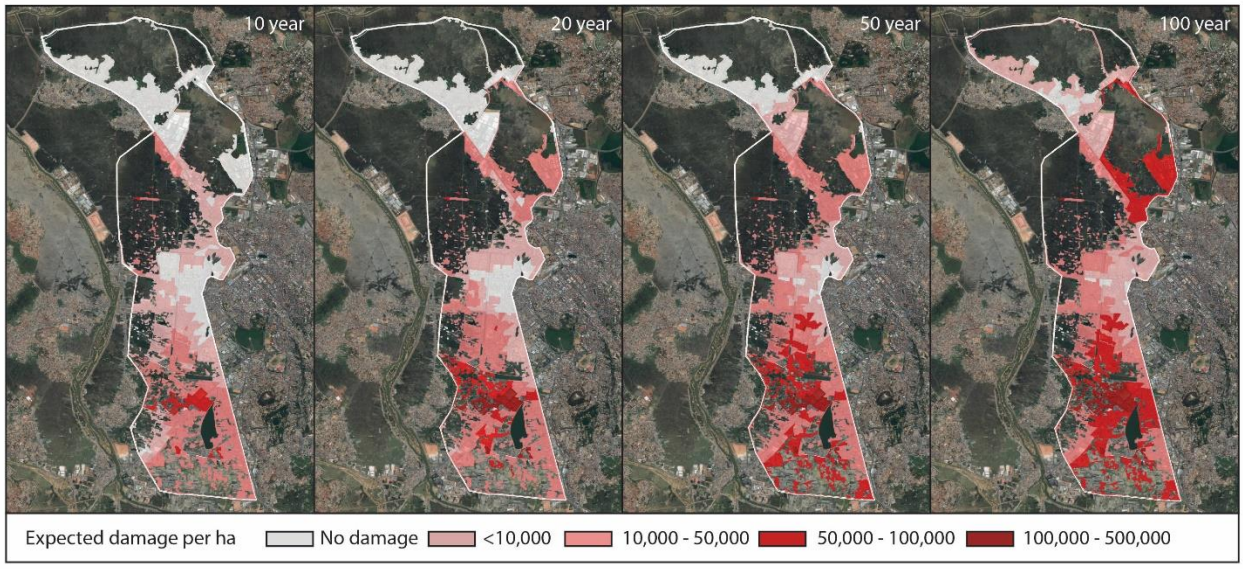
[33] SSBN 90m resolution Global Flood Hazard maps, provided to the World Bank for internal use under a 2017 GFDRR contract.
[34] Greater Antananarivo: urban poverty and resilience study (Homman et al. 2017)
[35] Extracted from openstreetmap.org and land use data obtained from local authorities
[36] Huizinga, J., Moel, H. de, Szewczyk, W. (2017). Global flood depth-damage functions. Methodology and the database with guidelines. EUR 28552 EN. doi: 10.2760/16510

Figure 2: Flood levels in the project area for a 10, 20, 50 and 100-year return time flood. The flood level is based on SSBN flood data aggregated to enumeration area level. The flood levels are only displayed in built-up areas in the area targeted by the project (marked by the white line).



23. Figure 3 shows the expected flood damage per hectare in built-up areas in the project area during a 10, 20, 50 and 100-year return time flood. The damage assessment is conducted on Enumeration Area (EA) level, combining the flood depth information with property value per hectare and applying the depth-damage functions. Different damage functions are applied for residential and commercial properties.

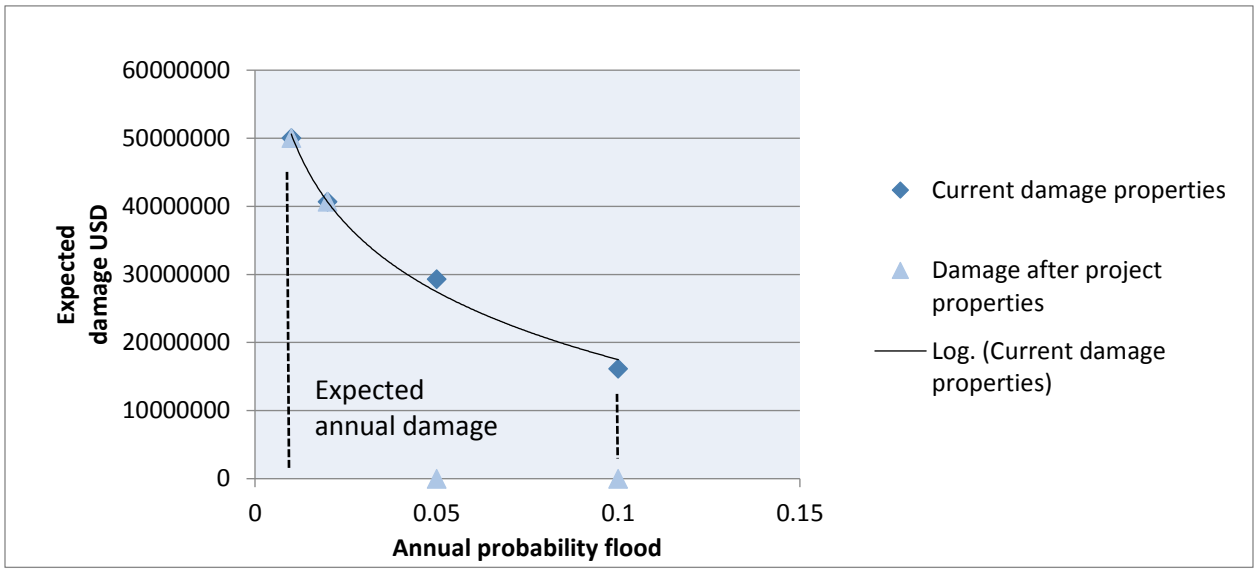
Figure 3: Expected damage per hectare to private and commercial properties in the project area for a 10, 20, 50 and 100-year return time flood.



24. Figure 4 shows a plot of the annual probability of a flood and the expected damage associated with this event for the whole project area. A 100-year return time flood causes an expected damage of just over US$50 million, whereas under the current circumstances, 10-year return time causes expected damage of US$16 million. Based on the four points (10, 20, 50 and 100-year) it is possible to fit a loss exceedance curve (see Figure 4) and to estimate the expected annual damage (EAD) due to flooding in the project area. The EAD is calculated using the integral of the loss exceedance curve, i.e. the area under the curve. For the current situation, the EAD for the project area is estimated at US$2.6 million.

25. The dikes that surround the project area were designed to withstand 20 or 50-year return time floods, but due to a lack of maintenance the current level of protection is estimated below the 10-year return time flood. If we assume that the project brings up the protection standards to 20-year, the EAD will be reduced by US$1.6 million to US$1 million. If we assume that the project brings up the protection standards to 10 years, the EAD will be reduced by US$0.4 million to US$2.2 million.

Figure 4: A plot of the probability versus the expected damage of floods in the project area.



26. Beside material damages to private households and public infrastructure, flooding disturbs economic activities and adversely affects health: 30 percent of households in the targeted area report a loss of income due to flooding in the last three years; in the aftermath of the flood Chedza, 15 percent suffered from an unusual episode of illness (22 percent among the poorest, 13 percent among the better off); about one fourth of all the households affected in the city reported school was interrupted. The following section evaluates the additional economic benefits of the project's overall environmental upgrading on public health and livelihood.

Environmental upgrading, benefits to poor households

27. In addition to the works on canalization and drainage, sub-component 1.1 will finance investments in sanitation and sub-component 1.2 will finance neighborhood upgrading. At this stage the project does not provide details on the content of those interventions. The reason is that investments in sanitation will be executed in tandem with drainage investments following the development of the Drainage and Sanitation Master Plan for Greater Antananarivo scheduled to be completed in 2018. Moreover, the nature of investments for urban upgrading will be identified based on the participatory preparation of the Detailed Urban Plan for the intervention area.

Benefits from better sanitation associated to works on canalization and drainage

28. Better sanitation and improvement in waste management will contribute to the sustainability of the new drainage infrastructure and enhance the impact of the project on public health by substantially reducing the risk-factors of diseases associated to contaminated water.

29. Cost benefit analyses in the health sector are often based on the estimation of the reduction in disability adjusted life years (DALYs) associated with the cases of diseases the interventions could avert. DALYs measure the number of years lost due to ill-health, disability or early death due to diseases. They are calculated for each country by the Institute for Health Metrics Evaluation (IHME) which also estimates the contribution of environment and behavior as a risk factor. Based on the HIME's Global Burden of Disease (GDB) database[37], diarrheal and lower respiratory infections are the first leading causes of deaths and disability in Madagascar. Despite impressive improvement in the last decade, unsafe water and sanitation environment and handwashing behavior are still the second group of risk factors after malnutrition. Those risks are evaluated, however, for the whole country, so they are difficult to apply in the context of this project. On the other hand, most of the evaluation of the risk factors are made in relation to the importance of basic sanitation and improved access to water on diarrheal diseases[38].

30. The estimates presented below are consequently based on the estimate of the DALYs saved from microbial risks in the Accra Urban Water System (Labite et al., 2010) in a similar context where most Ghanaian households, at that time, discharged black waste water into septic tanks or soakways that often discharged in small roadside storm water drains. The study found that a major transmission route of waterborne diseases was the ingestion of contaminated water by children, while playing near open roadside drains. Based on each pathogen and the demographics of the affected areas, children's exposure to microbial contamination from open drains was estimated to cause on average 0.42 DALYs per child[39]. A more recent study on microbial risks of food average fecal exposure of children 1 to 5 years old (Wang et al. 2017) observes that exposure to drains is not frequent but results in high contamination of children and that "interventions that prevent occurrence of such outlier doses are expected to have the greatest predicted health impact". Consequently, the estimate of the benefits of the project on health are evaluated based on the number DALYs that could be saved per child 1 to 5 years old (10744) living in the targeted area in front of an open drain of which 75 percent live in poor households**. Improved sanitation from better drainage would avert 4559 DALYs equivalent to U$ 23.8 million, of which 75 percent i.e. U$ 17.8 million, would benefit the poor** (costed at the level of the GNI per capita of US$385 per capita in

[37] *http://www.healthdata.org/madagascar*
[38] Pruss et al. 2002; Classens et al. 2014
[39] A study (2007) on the microbial contamination of drinking water in Accra found that the sum of the disease burden was of 0.5 DALYs per person per year.

2016, and a discount rate of 5 percent).

Income effect of investments in improved water supply (showers, public fountains etc.)

31. The rehabilitation of public points of water supply and the construction of new ones will likely enable more frequent hygiene behavior, safer food preparation, and a cleaner residential environment. These factors will contribute to the health improvement described above (Wang et al. 2017). By reducing the time spent on getting water, they may also produce significant economic benefits.

32. The area is dense and sub-equipped in public places to access and use safe drinking water. Total time for going and queuing up at public fountains is 50 percent higher than in other places. One household spent in 2016 on average one hour at water chores. Flooding, network maintenance or when water tanks cannot be replenished due to power outage make this time even longer[40].

33. A whole economy has, moreover, developed around the distribution of water. Public fountains are managed by community associations that buy water from JIRAMA (the public utility) and sell it to customers. Better off families buy the service of water-carriers; small traders profit from the affluence around the points of distribution; households with piped water sell water to their neighbors etc.

34. Access to safe drinking water, as a result, is expensive and more likely rationed. JIRAMA's tariffs are low[41] but a 10-liter water jerrycan costs MGA 5 at public water points[42] and, in the targeted area, 39 percent of the households buying water pay an even higher final price . Half of these households, among them some of the poorest, pay three times the basic price. At those prices, few households in the area can afford the minimum volume of 20 liters of water per person that is recommended by the World Health Organization to cover health, hygiene and all domestic uses. For 47 percent of households in the first three quintiles (likely poor) in the neighborhood, the resulting cost would exceed 3 percent of their budget[43,44]. The level of consumption of water is, therefore, largely suboptimal.

35. The intervention will facilitate higher use of safe water by contributing to the reduction of these costs. New points of supply will help spread the demand, reduce the distance and the queuing at each access point. Water carriers will become more efficient at their task and because water consumption is currently constrained, a larger demand should match the larger potential supply. The intervention should not significantly affect the income of people in the sector but also open new business opportunities.

36. A simple regression between the cost of a jerrycan of water and the time spent to get it with the results of the household survey shows that the reduction in access time to water points at the level observed in the other neighborhoods (i.e. by 7 minutes) could lead to a drop in the water price by 10 percent equivalent to an income effect of a similar size for about 30,000 poor households whose

[40] *http://quebec.huffingtonpost.ca/2017/03/22/corvee-eau-madagascar_n_15539910.html* visited oct.2017
[41] *http://www.jirama.mg/templates/JiramaEau-Tarif.htm*
[42] See users' testimonies in web article cited above
[43] Total household's consumption included imputed rent
[44] *https://washdata.org/monitoring/inequalities/affordability*

consumption of water is likely constrained today. **The income effect would be in the order of US$ 8.5 million** (at a discount rate of 5 percent).

Neighborhood upgrading and property gains

37. The improvements in well-being described above are part of a broader group of second-order effects expected from the project, including the heightening of the area's economic activities. The lesser frequency and seriousness of floods as well as the investments in neighborhood upgrading - in mobility and safety and accessibility infrastructure such as roads, foot-paths, and street lighting or in social services such as health centers, schools, community development spaces, and public spaces - would transform the neighborhood and increase its efficiency and attractiveness to new businesses.

38. Currently the area appears more isolated and less safe than other comparable risky neighborhoods that were also exposed to the 2015 flooding and are situated within a radius of 10 km from the city core. In the targeted area, about half (54 percent) of the households live on earth paths that cannot be driven on. During the rainy season, it takes longer to reach the closest tarmac or cobbled street than in similar other neighborhoods (12 minutes vs. 8 minutes). Street lights if any are often not functional (17 percent of the households live on street with functioning lights against 31 percent in other similar neighborhoods); 70 percent of the respondent feel unsafe walking at night (against 56 percent in other similar neighborhood).

39. The area appears also less dynamic. The share of self-employed is higher than in similar neighborhoods (62 percent of working household's head against 57 percent) but within a radius of 5 km from the city core, the share of households' business premises is lower by 10 percentage points than in other similar neighborhoods flooded in 2015.

40. Much of this is the result of recurring floods and resulting damages to public infrastructure and barriers to economic and livelihood activities. By reverting and upgrading the situation the project would have a transforming impact on the neighborhood. The strengthening of urban management services should, moreover, make those gains sustainable in the long-term. The average income in the area would progress and real estate properties would eventually benefit from the greater socio-economic dynamism, easier access and, better environment. According to the WB study on Greater Antananarivo Urban Resilience, being located in flood-shock site is associated with a 1.34 percent lower rent. According to this estimate, **the total gain in property value in the targeted area would amount to US$ 49.0 million**[45] (at a discount rate of 5 percent).

41. This full impact based on the comparison of the property value of risky and non-risky could be over-evaluated. First, people who live currently in the non-risky areas might have un-observed characteristics to the analysts (like social networks) that have contributed to their current choice of residence and the value of their residence. In such a case, the "true" impact of transforming the area would be lower. Second, the project could not totally prevent the area from flooding and only a portion of those benefits could materialize.

[45] Estimate of property values based on rents and a discount rate of 10 percent , or a ratio property value to rent of 10

Distributional impact

42. Finally, the project would have significant impact on inequality. The residents of the area would benefit from 44 percent of the expected real estate asset appreciation. Although better-off households would benefit most, poor owners (home to 34 percent of the poor population of the area) would capture 39 percent of those gains. The latter, in turn, will increase household resilience and access to credit. Policies supporting poor households to regularize their title deed would increment those benefits since 29 percent of the dwellings owned by poor owners do not have regular titles.

43. As a large portion of the dwellings in the area are being rented (40 percent) or occupied for free (16 percent), the project would likely benefit also residents outside the areas, including large real estate companies since a small number of owners possess spaces that account for a significant area of the city (WB, 2011[46]).

44. The higher impact on inequality would come from a healthier environment. As explained above, the health gains from flood mitigation and improved sanitation, equivalent to about US$13.6 million, would come from the reduction of bacterial contamination of young children aged 0 to 5 living nearby open insalubrious drains. Three quarters of those children live in poor households.

45. Finally, the income impact of reducing barriers to water collection of US$4.8 million would all be associated with 45 percent of the poor population of the area whose current consumption of water is sub-optimal.

Table 2: Net present value benefit/cost ratio depending on the number of buildings in the area, the impact of the flood mitigation and discount rates.

Scenario*	Discount rate		
Low – 20-year protection standard	**5%**	**10%**	**15%**
Present costs	65.2	59.4	54.7
Present benefits	90.0	58.9	43.7
B/C ratio	1.4	1.0	0.8
NPV	24.8	-0.5	-11.0
Low – 10-year protection standard			
Present costs	65.2	59.4	54.7
Present benefits	60.4	43.4	34.7
B/C ratio	0.9	0.7	0.6
NPV	-4.8	-16.0	-20.0
High – 20-year protection standard			
Present costs	65.2	59.4	54.7
Present benefits	138.3	84.0	58.5

[46] *L'urbanisation ou le nouveau défi malgache* (World Bank, March 2011).

B/C ratio	2.1	1.4	1.1
NPV	73.1	24.6	3.8
High – 10-year protection standard			
Present costs	65.2	59.4	54.7
Present benefits	84.5	56.0	42.1
B/C ratio	1.3	0.9	0.8
NPV	19.3	-3.4	-12.7

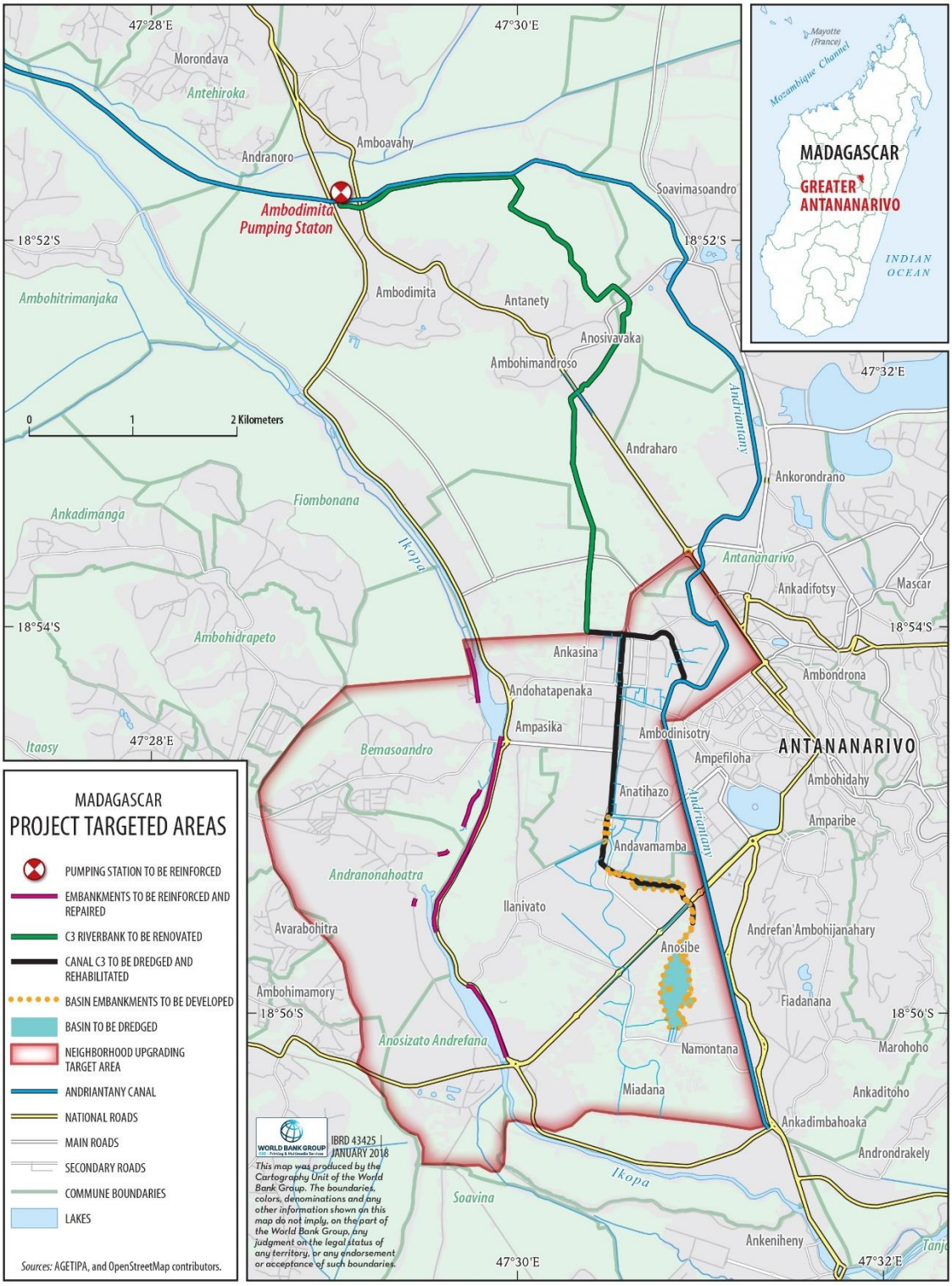
* Low and high cases differ regarding the number of buildings in the area

Table 3: Distribution of the yearly impact over 30 years in the low case scenario, with a 20-year flood prevention and a discount rate of 8.8 percent corresponding to a net present value equal to zero.

	Total	2018	2019	2020	2021	2022	2023	...	2029	...	2047
Project costs	**59.6**	**14.1**	**12.8**	**11.7**	**10.6**	**9.7**	**0.1**		**0.0**		**0.0**
Investment costs distribution											
Disbursements		20%	20%	20%	20%	20%	0%		0%		0%
Present value	58.5	14.0	12.7	11.6	10.6	9.6	0.0		0.0		0.0
Operating and maintenance costs											
in % of component 1		0.16 %	0.16 %	0.16 %	0.16 %	0.16 %	0.16 %		0.16 %		0.16 %
Present value	1.0	0.1	0.1	0.1	0.1	0.1	0.1		0.0		0.0
Project benefits	**59.6**	**4.7**	**6.7**	**6.5**	**6.4**	**6.2**	**1.4**		**2.0**		**0.4**
Direct impact on income & consumption											
Domestic spending (US$ mln)		4.7	7.3	7.3	7.3	7.3	0		0		0
Present value	28.0	4.7	6.7	6.1	5.5	5.0	0		0		0
Averted damages on property assets (flood mitigation works)											
Distribution of impact				50%	50%	100%	100%		100%		100%
Present value	6.1			0.3	0.3	0.5	0.5		0.3		0.1
Appreciation of property assets (neighborhood upgrading)											
Distribution of impact				10%	20%	30%	40%		100%		100%
Present value	25.5			0.1	0.6	0.6	0.9		1.7		0.3
Benefits on poor households											
Averted disability adjusted life years (DALYs, drainage and sanitation works)											
Distribution of impact				33%	66%	100%	100%		100%		100%
Present value	10.4			0.4	0.7	0.9	0.8		0.5		0.1

Income impact on poor households water constrained									
Distribution of impact		30%	60%	100%	100%		100%		100%
Present value	5.0	0.2	0.3	0.4	0.4		0.2		0.0
Appreciation of property assets									
17% of owners are poor	4.4	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3

ANNEX 5: MAP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Morondava
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Ambohitrimanjaka
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Ambohimandroso
Andraharo
Andriantany
Ankorondrano
Fiombonana
Ankadimanga
Ikopa
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Ankadifotsy
Mascar
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Ankasina
Ambondrona
Andohatapenaka
Ampasika
Ambodinisotry
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Ilanivato
Avarabohitra
Andrefan'Ambohijanahary
Anosibe
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Miadana
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Androndrakely
Soavina
Ankeniheny
0
1
2 Kilometers
Mayotte (France)
Mozambique Channel
MADAGASCAR
GREATER ANTANANARIVO
INDIAN OCEAN
MADAGASCAR
PROJECT TARGETED AREAS
PUMPING STATION TO BE REINFORCED
EMBANKMENTS TO BE REINFORCED AND REPAIRED
C3 RIVERBANK TO BE RENOVATED
CANAL C3 TO BE DREDGED AND REHABILITATED
BASIN EMBANKMENTS TO BE DEVELOPED
BASIN TO BE DREDGED
NEIGHBORHOOD UPGRADING TARGET AREA
ANDRIANTANY CANAL
NATIONAL ROADS
MAIN ROADS
SECONDARY ROADS
COMMUNE BOUNDARIES
LAKES
Sources: AGETIPA, and OpenStreetMap contributors.
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