



Combined Project Information Documents / Integrated Safeguards Datasheet (PID/ISDS)

Appraisal Stage | Date Prepared/Updated: 20-April-2018 | Report No: PIDISDSA23982



BASIC INFORMATION

A. Basic Project Data

Country Madagascar	Project ID P164318	Project Name Madagascar Power Sector Operations Improvement Project - AF to ESGIP	Parent Project ID (if any) P151785
Parent Project Name MG-Electricity Sec Operations & Governance Improvement Project(ESOGIP)	Region AFRICA	Estimated Appraisal Date 23-Apr-2018	Estimated Board Date 11-Jun-2018
Practice Area (Lead) Energy & Extractives	Financing Instrument Investment Project Financing	Borrower(s) Ministry of Budget and Finance	Implementing Agency JIRAMA, Ministry of Energy and Hydrocarbons

Proposed Development Objective(s) Parent

The Project Development Objective is to improve the operational performance of the national electricity utility (JIRAMA) and improve the reliability of electricity supply in the project area and, in the event of an eligible crisis or emergency, to provide immediate and effective response to said eligible crisis or emergency.

Components

- Improving electricity sector planning and financial sustainability
- Strengthening operational performance and governance of JIRAMA
- Investing in enhanced reliability of electricity
- Project management
- Contingent Emergency Response

Financing (in US\$, millions)

Financing Source	Amount
International Development Association (IDA)	40.00
Total Project Cost	40.00

Environmental Assessment Category

Partial Assessment (B)

'Have the Safeguards oversight and clearance function been transferred to the Practice Manager?' No

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Decision

Other Decision (as needed)

B. Introduction and Context

1. This Project Paper seeks the approval of the Board of Directors to provide additional financing (AF) for The Madagascar Electricity Sector Operations and Governance Improvement Project (ESOGIP-P151785) in the form of additional International Development Association (IDA) credits of US\$40.0 million equivalent to the Republic of Madagascar.
2. The parent Project, approved by the World Bank Board on March 23, 2016, provides IDA credit financing to implement five components. Component 1 (US\$ 2.48 million) aims to improve electricity sector planning and financial sustainability by supporting adoption of systematic planning of the optimum (least-cost) investments needed to develop the power sector in Madagascar and strengthen in a sustainable manner the capacity of Government agencies responsible for planning the power sector. Component 2 focuses on strengthening operational performance and governance of the national electricity and water utility, JIRAMA, through the preparation and effective implementation of a performance improvement plan (PIP) for the company, including organizational restructuring and competitive selection of a new top management team, incorporation of Management Information Systems (MIS) to enhance efficiency, transparency and accountability in operations, and implementation of a revenue protection program targeting large customers. Component 3 (US\$ 48.62 million) finances priority investments to rehabilitate, reinforce and upgrade existing electricity transmission and distribution infrastructure. Component 4 (US\$ 1.34 million) supports project management, while component 5 refers to contingent emergency response.
3. The proposed AF aims at consolidating and scaling up significant positive impacts on power sector performance achieved through implementation of ESOGIP by: (i) providing additional technical assistance to ensure full implementation of the PIP of JIRAMA, in particular the organizational restructuring of the company; (ii) financing upgrade of JIRAMA's dispatch center and network automation systems and rehabilitation and reinforcement of distribution networks, to improve quality in electricity supply and make possible the integration of variable renewable energy (VRE) generation; (iii) financing preparatory studies and providing technical for the development of small hydropower projects able to produce low-cost electricity contributing to reduce overall generation cost.
4. The project development objective (PDO) of the parent ESOGIP is to improve the operational performance of JIRAMA, improve the reliability of electricity supply in the project area, and to provide immediate and effective response in the event of an eligible crisis or emergency. This PDO will remain unchanged. The Project Results Framework will be updated to reflect the impact of the proposed AF.



Progress towards the achievement of the development objective and implementation progress of ESOGIP in the past 12 months have been rated as moderately satisfactory.

As part of this AF, it is also proposed to extend the ESOGIP closing date by 18 months, bringing the closing date to December 31, 2021. This will provide sufficient time to complete the activities under the AF. The activities of the proposed AF are not expected to change the ESOGIP current safeguard classification of 'B', but they have triggered three additional safeguard policies, including OP 4.04 (Natural Habitat), OP 4.36 (Forest) and OP 4.37 (Dam Safety) because of the AF's support to the development of small hydro power subprojects.

Country Context

5. **The positive trend of the gross domestic product (GDP) per capita shows that the country's economy is continuing to grow.** In 2016, real GDP increased by 4.3 percent compared to only 2.6 percent of GDP for the period 2011–2015¹. However, recent economic growth was mainly driven by construction activities related to the scale-up of public investment and textiles exports following the reinstatement of Madagascar's eligibility for the African Growth and Opportunity Act (AGOA).² For 2017, the growth rate is projected to remain at the same level at 4.2 percent. In 2012, only 30 percent of the population in Madagascar lived above the national poverty line and 10 percent above the international poverty line. Moreover, the country's population growth of 2.78 percent per year puts additional pressures on the insufficient delivery capacity of basic services, on natural resources, and on growth.

Sectoral and Institutional Context

6. **Madagascar's social and economic development continues to be constrained by the lack of reliable electricity services.** About 15 percent of the population had access to electricity in Madagascar in 2016, predominantly in urban areas (39% of population in urban and peri-urban areas have access vs only 5 percent of the population in rural areas having access). With the continuing deterioration of the sector's financial situation, quality of electricity services remains poor, and electricity access rates have not increased significantly in recent years. Consequently, Madagascar continues to perform poorly in the Doing Business Report 2017's 'Getting Electricity' indicator, ranking 185th out of 190 countries, with applicants waiting an average of 450 days³ to get an electricity connection.

7. **The Government adopted the "New Energy Policy" (NEP) and issued the Sector Policy Letter in 2015 to scale up renewable energy generation and to increase electrification rate.** The NEP encourages a rapid scale-up of renewable energy including hydropower and solar generation, and the development of public-private partnership schemes and concessions. Consistent with the NEP, the

¹ Madagascar's annual population rate is estimated at 2.78 percent.

² The AGOA is a United States Trade Act that enhances market access for countries in Sub-Saharan Africa, which improve the rule of law, human rights, and respect for core labor standards. Madagascar lost AGOA eligibility in 2009 following the political crisis and regained it in 2014 after the return to constitutional order.

³ Doing Business Report 2017.



sector policy letter for the period 2015-2030 highlights the GoM’s goal to increase household electricity access in the country from 15 to 70 per cent by 2030.

8. **Madagascar’s energy mix for electricity generation is dominated by expensive thermal**

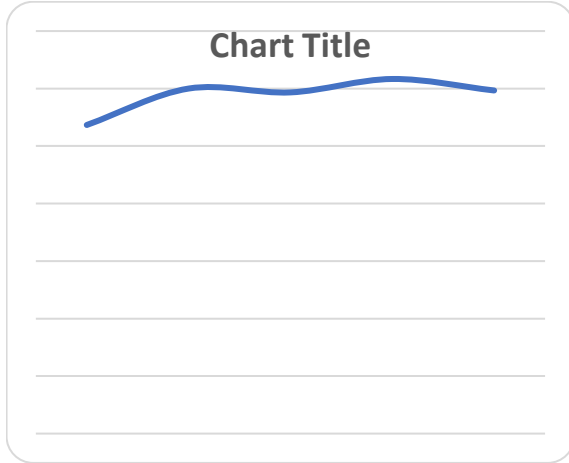


Figure 1: System Losses (%)

Source: Electricity Regulatory Agency (Office de Régulation de l’Électricité, ORE)

sources. In 2016, about 58 percent of the country’s power generation came from low-efficiency generators running on imported fuel, with the remaining 42 percent produced by hydropower plants. The cost of thermal generation has consistently increased in recent years due to the impact of expensive directly negotiated power purchase agreements (PPAs) for new thermal plants signed between JIRAMA and independent power producers. In 2016, the electricity system of the country generated 1,651 GWh with a peak demand of 342 MW.

9. *The electricity sector faces multiple challenges.*

10. **First, JIRAMA’s cost-revenue imbalance is substantial and unsustainable in the medium-term.**

On the one hand, JIRAMA’s supply cost is high (estimated at US\$0.30 per kWh in 2017) due to dependence on expensive thermal generation and high losses in supply to customers. On the other hand, the average revenue was only about US\$0.15 per kWh billed in 2017, requiring JIRAMA to rely on government subsidies (as much as US\$141 million in 2017). The operational performance of JIRAMA declined over the last 5-7 years, mainly because of poor management. System losses during the past five years averaged around 33 percent, with about one-third of electricity produced not sold to JIRAMA’s customers. In January 2018, the GoM increased the average tariff of JIRAMA by 10 percent to increase the utility’s revenue, to contribute to the objective of attaining financial equilibrium by 2020, which, in addition to revenue increase, requires costs optimization and system efficiency enhancement.

11. **Second, the electricity network infrastructure is in poor operational condition, with overloads and bottlenecks in several segments, as a consequence of long-term underinvestment.**

Madagascar’s power grid is composed of three main networks: Antananarivo, Toamasina, and Fianarantsoa, all of which are operated by JIRAMA. The interconnected network of Antananarivo is the largest system and covers about 60 percent of the total electricity consumption in Madagascar. Decades of underinvestment in grid extension and rehabilitation have led to a chronically overloaded grid, resulting in low service quality and severely constraining the possibility to connect new users. The existing distribution networks in the capital city and in major towns of Madagascar were installed in the 1980s, and have reached in most cases the end of their lifetime.

12. **Third, Madagascar will need significant additions of generation capacity to meet rising demand.**

The results of the Least Cost Power Development Plan (LCPDP) at final stages of preparation show that an additional capacity of 339 MW, generating about 1,649 GWh/year, is needed in the Interconnected Network of Antananarivo by 2035 to balance the expected 2.5 times increase of the

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demand underpinned by the high rate of population growth (about 2.8 percent/year), public works, and industrial activities. A recent World Bank assessment of expected timelines and delays in the development of hydropower resources in the country showed that integration of solar generation and/or small hydropower into the main grid in the next 2–4 years will be needed to satisfy demand at an acceptable cost. Thus far, only 40 MW of grid-connected PV projects have been identified, including a 20 MW Scaling Solar Initiative implemented jointly by the World Bank and International Finance Corporation (IFC). However, there are significant opportunities to transition to a lower carbon path and to strengthen the operation and financial foundations of the sector.

13. **Madagascar possesses enormous potential in renewable resources for electricity generation,** particularly hydropower with a potential of about 7.8 GW, of which only 160 MW is currently exploited. There are about 1,500 untapped hydro sites ranging from 10 kW (or less) to 600 MW, located throughout the country. With an average solar irradiation of about 2,200 kWh/m²/year and average wind speeds of up to 7 m/s in many parts of the country, Madagascar also has considerable solar and wind energy resources. The results of the LCPDP indicate that Madagascar could diversify its generation mix through the development of hydro and solar resources, complemented with thermal generation using heavy fuel oil (HFO) to satisfy the short and long terms needs. The incorporation of renewable generation capacity following competitive bidding processes could significantly reduce the generation cost. However, major upgrades in grid automation and dispatch technologies, including SCADA systems, are urgently needed before significant amounts of renewable energy can be injected into the grid. The current dispatching system operated by JIRAMA is outdated, severely limiting the capacity of the networks to receive and transmit renewable energy generation.

14. **The development of small hydro generation projects pipeline has advanced significantly.** The Bank has supported an assessment of Madagascar’s small (less than 20 MW) hydro power generation (“hydro”) sites. A small hydro atlas and pre-feasibility studies of two priority sites (G407 and SF196) were developed through an Energy Sector Management Assistance Program (ESMAP) funded activity. The results of the pre-feasibility study showed that there are 17 highly promising small hydro sites with a total installed capacity of about 160 MW. The study also recommended that small hydro sites should be used more extensively to satisfy medium-term demand because they allow for a more decentralized generation footprint and can be developed within much shorter timeframes than large hydro projects. In addition, standard Power Purchase Agreements (PPAs), standard Concession Agreements, and Safeguard Frameworks have been prepared to facilitate the development of these priority small hydro sites by the private sector, given the scarcity of public resources.

15. **Strengthening the operational and financial performance of JIRAMA is at the heart of sustainable development of the power sector.** It is key for JIRAMA to expand electrification towards achieving universal access, and enable private investments (mainly in the generation segment) by becoming a reliable off-taker. With the support of the World Bank, the GoM has started the implementation of measures to strengthen the management of the company and improve its operational performance. The Performance Improvement Plan (PIP) prepared in 2016 is currently under implementation. It includes the organizational restructuring of the company and appointment of top managers through competitive processes, the incorporation of an integrated management information system (MIS) to support efficient, transparent and accountable development of operations in key business areas, and the implementation of a Revenue Protection Program (RPP) to reduce non-technical losses. At present most of the Directors in the new organizational structure of JIRAMA have been



appointed, and the process to select managers at lower levels is progressing satisfactorily. However, in order to boost effectiveness of the new structure and management team, the company needs to complement selection of its new management team with the immediate implementation of a performance linked incentive program for management and employees at other levels. JIRAMA needs short-term financial support to implement that program while the company moves towards achieving operational and financial viability. From 2021 onwards, it is expected that JIRAMA would be able to fully finance any labor cost through tariff revenues.

C. Proposed Development Objective(s)

Original PDO

The Project Development Objective is to improve the operational performance of the national electricity utility (JIRAMA) and improve the reliability of electricity supply in the project area and, in the event of an eligible crisis or emergency, to provide immediate and effective response to said eligible crisis or emergency.

Current PDO

The Project Development Objective will remain unchanged.

Key Results

PDO Indicators:

- The end target of “Total electricity losses per year in the project area” is revised from 28% to 26%. This will capture additional loss reduction as the result of activities to improve transmission and distribution infrastructure under Component 3.
- The end target of “Interruptions in electricity service per year in the project area” is also revised from 650 to 580 to measure additional reliability improvement under Component 3.
- The number of direct beneficiaries is increased from 175,000 to 225,000 to reflect additional geographical scope under Component 3.

Intermediate Indicators:

- A new sub-indicator on “Transmission Line Rehabilitated” is added to capture the work progress of new component 3 activities on the rehabilitation of the Antananarivo -Antsirabe 63KV transmission lines. The end target is set at 100km.
- The end target of “Distribution lines constructed or rehabilitated under the project” is revised from 195km to 300km to capture additional geographical scope under Component 3. The breakdown between new construction and rehabilitation is 165km and 135km respectively.
- New indicators on “Voluntary Retirement Plan prepared and implemented” and “Performance-based compensation plan prepared and implemented” are added to capture the activities proposed under component 2.



- New indicators on “New Dispatching Center constructed and commissioned” and “New Distribution Control Center constructed and commissioned” are added to reflect new investments under component 3.
- A new indicator on “Competitive Bidding process for the development of one priority small hydro site launched” will be added to measure the progress of additional technical assistance for mini-hydro development under component 1.
- A new indicator on “Gender-sensitive campaign conducted in JIRAMA” is added to capture the gender dimension of the project.

Where relevant, target dates will be revised to reflect the expected work schedule.

D. Project Description

16. The AF introduces new sub-components and new activities under the components of the parent project as described below. Each proposed activity can be allocated to one of the components of the ESOGIP, as shown in the following paragraphs.

Component 1: Improving electricity sector planning and financial sustainability (Indicative amount: IDA US\$3.5 million equivalent)

17. A new activity “Provision of technical assistance, capacity building, and consultancy service for the development of small hydro” will be added to the Component 1 to support preparation of tenders for bankable projects to implement high-priority small hydropower plants (assessed under ESMAP funded TA). This will include reviewing pre-feasibility works for sites, finance detailed engineering, environmental and social studies needed to prepare bankable feasibility studies, and provision of transaction support and advisory services required to ensure competitive and transparent procurement processes. The component will also help to build capacity of institutions involved in sector planning (MWEH and JIRAMA) to facilitate the development of small hydro potential in the country through incorporation of new tools (models for long, medium, and short-term planning) and intensive training in their application, adoption of arrangements to systematize and ensure permanency to the planning process, and other related activities. Specifically, this component will use consultancy services and trainings to implement the activities:

Component 2: Strengthening operational performance and governance of JIRAMA (Indicative amount: IDA US\$5 million equivalent)

18. The AF will support the preparation and implementation of a human resource development plan and communication strategy for JIRAMA following the utility’s organizational restructuring and hiring of new senior management. Specifically, this component will help JIRAMA to fully integrate newly hired staff, build functional teams, train staff at all levels in the systematic use of the information systems instituted under the ESOGIP, introduce performance-based pay, increase the overall effectiveness of the company’s workforce, and prepare a voluntary early retirement and redundancy plan to be implemented by JIRAMA with Government funding to reduce overstaffing. The component would fund performance based



incentives in line with the recommendations of the HR development plan. It will also finance the acquisition of some equipment and tools for logistic support (office equipment, etc.) needed to improve working conditions and achieve acceptable levels in staff productivity. Finally, the acquisition of vehicles to support the mobility needs of commercial, and maintenance teams will be also financed to cover specific residual needs.

19. The component also will finance the installation of auxiliary systems and IT equipment such as server necessary for the operating of the Management Information System.

Component 3: Investing in enhanced reliability of electricity (Indicative amount: IDA US\$29.5 million equivalent)

20. This component will finance the reinforcement of existing distribution networks and the upgrade of the dispatch system of JIRAMA to (a) improve reliability and flexibility in network performance and quality of service provided to customers and (b) enable the integration of intermittent renewable energy into the grid. Activities in this component comprise the construction of a new dispatching center with state-of-art SCADA, and the design, procurement of network infrastructure equipment and of implementation works (including supervision) for system improvements and upgrades, such as rehabilitation of existing old 5 kV lines to operate at the current standardized medium voltage 20 kV, replacement of existing distribution transformers and associated equipment by others with larger capacity, replacement of rotten wooden poles and associated equipment in transmission and distribution lines. The component will also finance purchase of mobile substations and equipment for network maintenance, including mobile equipment for live-line works. In addition, the component will support a rehabilitation of an existing transmission line. Specifically, new activity on the rehabilitation of the Antananarivo -Antsirabe 63KV transmission lines will be added.

Subcomponent 3.1. Rehabilitation of existing 138/63 kV substations and rehabilitation and construction of existing 63kV transmission lines (Indicative amount: IDA US\$3 million)

21. At present, almost 80 percent of the wooden poles of the 63kV transmission line Antananarivo-Antsirabe are rotten. Frequent outages occur, leading to disruptions in the power supply to the city of Antsirabe. This sub-component will finance the procurement of concrete poles and 63kV line accessories, and the rehabilitation works will be undertaken by JIRAMA.

Subcomponent 3.2. Rehabilitation and/or upgrading of distribution network (Indicative amount: IDA US\$14 million equivalent)

22. Poor quality service, frequent outages, and prolonged power disruptions are due primarily to overloaded equipment and to failures in, and/or the absence of, protection devices and switchgear, in addition to obsolete line components. The AF will finance the following activities under this sub-component:

- a) Increasing equipment capacity (transformers, circuit breakers, line)
- b) Replacing and installing protection and switchgear equipment, as well as line accessories (circuit breakers, switches, isolating spark gaps, fuses, line accessories)



- c) Acquiring mobile MV/LV substations
- d) Acquiring testing, measurement, and analysis devices for equipment and networks (such as protective relays, cables, transformers...)
- e) Replacing rotten wooden poles with concrete poles
- f) Installing overhead lines and upgrading to 20KV at selected distribution substations.

23. The sub-component essentially includes supplies and works with about 255 km of cables and bare conductors, 5,000 concrete poles, 6,000 wooden poles, 160 transformers, 300 circuit breakers, 200 isolating spark gaps, and 160 line-switches. In addition, this sub-component will support JIRAMA to improve its maintenance workshop. The key activity is to repair the defective distribution transformers for fast reincorporation to the network. The sub-component will finance the procurement and installation of rewinding machine, measuring equipment, processing devices, mobile workshop, and test platform. The sub-component will also help JIRAMA to improve network maintenance and reduce the duration of planned outages for maintenance, by financing acquisition of equipment for maintenance, in particular under the live-line modality.

Subcomponent 3.3. New Dispatching Center and new Distribution Control Center for the Antananarivo interconnected network (Indicative amount: IDA US\$12.5 million equivalent)

New Dispatching Center (Indicative amount: IDA US\$7.5 million equivalent)

24. JIRAMA needs to upgrade its control and supervisory system (SCADA) to equip it with modern technology required to operate the power system meeting international standards on quality and reliability in service delivery under current conditions and those resulting from implementation of new generation and transmission projects, including those using intermittent renewable resources.

25. To integrate renewable energy resources, particularly hydro and solar generation in the Antananarivo Interconnected Network that is expected to be connected to the Toamasina and Fianarantsoa networks, JIRAMA needs to upgrade its control and supervisory system (SCADA) to equip it with modern technology to manage these energy resources under optimum quality, cost and safety conditions.

New Distribution Control Center (Indicative amount: IDA US\$5 million equivalent)

26. The establishment of a new Distribution Control Center (DCC) is needed to improve electricity distribution operations in the Antananarivo interconnected network, and:

- a) Improve the electricity supply to customers and minimize the duration of outages due to incidents;
- b) Optimize the management and operation of the distribution network;



- c) Minimize financial losses from energy not supplied to customers, particularly with the incorporation of lower cost hydro and solar generation
- d) Ensure global monitoring and supervision of the network condition.

Component 4: Project management (Indicative amount: IDA US\$2 million equivalent)

27. The AF for this component will provide support to the Project Implementing Unit within the MWEH and JIRAMA for management of activities proposed under the AF.

Sub-component 4.1: Project Management support to MWEH (Indicative amount: IDA US\$0.65 million equivalent)

28. This sub-component includes (i) financing the contracting of financial management specialists and procurement specialists as required to support project implementation; (ii) financing the project audit for the extended implementation period and the incremental operating cost; (iii) acquisition of vehicles for project supervision; (iv) financing for capacity building through training focused on MWEH, ORE, and ADER staff on different subjects related to the development of the energy sector; (v) purchasing of commercial type vehicles for project activities monitoring and supervision.

Sub-component 4.2: Project Management support to JIRAMA (Indicative amount: IDA US\$1.35 million equivalent)

This sub-component includes (i) financing the contracting of social and environmental safeguard consultants to prepare and monitor the safeguards studies, (ii) financing FM specialists and procurement specialists as required to support project implementation; (iii) financing the project audit for the extended implementation period and the incremental operating cost; (iv) acquisition of vehicles for project supervision; (v) financing for capacity building through training focused on JIRAMA staff on different subjects related to the improvement of the performances of JIRAMA; (vi) sensitization campaign for JIRAMA's customers; (vii) purchasing of commercial type vehicles for project activities monitoring and supervision.

E. Implementation

29. The activities in the proposed AF are fully incorporated to components of the ongoing ESOGIP; hence, the implementation arrangements will remain the same. The MWEH would be the responsible for the implementation of Component 1 and part of Component 4 and JIRAMA would implement Component 2, Component 3, and part of Component 4. The project coordinator of the Parent Project who is based at the MWEH would also be responsible for the coordination of the activities of the AF. The MWEH would be responsible for consolidating information on the various project activities and prepare and submit project monitoring reports to the World Bank. The Project Coordination Committee, chaired by the MWEH with members from sector institutions will provide strategic guidance and advice on alignment with sector policy and ensure overall governance and fiduciary oversight of the AF. The Strategic Committee for the reform of JIRAMA, established under the Parent Project, will oversee any actions related to the reform of the company.



30. For small hydropower plants, the AF will fund international technical assistance to strengthen existing safeguard implementation and to increase environmental and social safeguard management capacity. MWEH and JIRAMA would be responsible for the implementation of safeguard measures for the development of small hydropower plants and the rehabilitation of transmission lines. JIRAMA is composed of an operational Environment and Risk Prevention Department with 8 full-time staffs who will be improved their capacity to manage Environmental and Social Impact Assessment (ESIA) for small hydropower plants through the technical assistance above. The MWEH and JIRAMA’s consultant firm will prepare the necessary specific safeguard instruments based on the ESMF and RPF in parallel with the technical studies of small hydropower projects. Supervision and monitoring of the implementation of specific ESMPs will be carried out by MWEH and JIRAMA after their capacity building at the International Office and the National Office for Environment (NOE), the national office in charge of environmental assessment in Madagascar.

F. Project location and Salient physical characteristics relevant to the safeguard analysis (if known)

The project is located in several regions in Madagascar although the project administration will be based in Antananarivo.

The 17 small hydro sites identified as priority are located in the high lands region (Amaron’i Mania, Analamanga, Haute Matsiatra) which are in mountainous area of the Eastern Coast region (region Alaotra Mangoro, Vatovavy Fitovinany, Analanjirofo). The Eastern Coast region is characterized by steep slopes and deep and narrow valleys. There are no protected areas around or across identified rivers and each potential hydro-site is in distance from the villages.

G. Environmental and Social Safeguards Specialists on the Team

- Paul-Jean Feno, Senior Environmental Safeguards Specialist
- Marina Rachel Gery Ramaroson, Environmental Consultant
- Peter F. B. A. Lafere, Senior Social Development Specialist
- Andrianjaka Rado Razafimandimby, Social Development Specialist

SAFEGUARD POLICIES THAT MIGHT APPLY

Safeguard Policies	Triggered?	Explanation (Optional)
Environmental Assessment OP/BP 4.01	Yes	The project activities including the technical assistance for the development of small hydropower plants under component 1 and the rehabilitation of transmission and distribution lines under component 3 could be associated with negative environmental and social impacts. The rehabilitation of transmission lines could generate: (i) noise; (ii) liquid waste (e.g.

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used oils); (iii) occupational health and safety hazards if the employees are not equipped with appropriate protective equipment; (vi) temporary displacement or loss of income when replacing rotten wooden poles, (vii) hazardous solid waste from old equipment (e.g. transformers). In addition to these impacts, small hydroelectric plants when implemented could (i) change the hydrological regime, affecting downstream aquatic ecosystems and water users, (ii) impact forest health and quality, and (iii) increase risks to the health and safety of workers and the local population during construction.

The AF remains Category B in line with the parent project as activities, will largely remain the same with the exception of the TA for the development of small hydro. For the development of small hydro, any hydro subproject that would be screened as category A will be excluded from project financing. The revised ESMF includes risk assessment of new activities, additional safeguard policies triggered, ToRs for the preparation of ESIA/ESMP for small hydropower plants, eligibility criteria for small hydropower projects to be considered under the AF project based on site sensitivity and environmental and social impacts and risks, environmental and social profile of the identified potential small hydro sites, and requirement to develop generic dam safety measures to be prepared by qualified engineers specialized in the construction of small dams.

Natural Habitats OP/BP 4.04

Yes

The ESMF has provisions for screening all the 17 potential small hydro subprojects. While any hydro subproject that would have adverse impacts on natural habitats will be excluded from the AF, small hydro, when materialized, could affect natural habitats such as rivers, streams and their ecology. The full ESIA for the selected small hydropower will assess impacts on natural habitats and include mitigating measures in the ESMP accordingly.

Forests OP/BP 4.36

Yes

Small hydro sites are located in modified forests according to the screening done in the ESMF Annex 4. Nevertheless, when materialized, small hydro subprojects might affect health of these forests and forest-dependent communities. Therefore, the ESIA will assess the potential impact of small hydro



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			projects on forest and local communities, and the mitigation measures will be incorporated in the ESMP.
Pest Management OP 4.09	No		The project will not purchase or use any pesticides
Physical Cultural Resources OP/BP 4.11	Yes		Small hydro construction and overhead lines installation could affect PCRs. The ESMF includes “chance find procedures” and ESIA/ESMP will include assessment of impacts on PCRs.
Indigenous Peoples OP/BP 4.10	No		There are no indigenous people living in the project targeted areas.
Involuntary Resettlement OP/BP 4.12	Yes		Project activities in component 1 and component 3 could generate temporary displacement or temporary loss of incomes. No permanent displacement is expected because small hydro sites are distant from villages. As the detailed design of small hydro (component 1) and additional investment (mainly component 3) are not known at present, the Resettlement Policy Framework (RPF) has been updated by the Borrower to include risks assessment associated to new activities, and ToRs for the preparation of RAP for small hydro.
Safety of Dams OP/BP 4.37	Yes		The project will include technical assistance to support preparation of bankable projects to implement priority small hydro projects. Given the characteristic of small hydro described in ESMF Annex 4, the application of generic dam safety measures prepared by qualified engineers specialized for small dams is considered to be adequate. Potential adverse impacts would be assessed and addressed through OP 4.01.
Projects on International Waterways OP/BP 7.50	No		This policy is not expected to be triggered by any of the project activities since Madagascar is an island.
Projects in Disputed Areas OP/BP 7.60	No		This policy is not expected to be triggered by any of the project activities.

KEY SAFEGUARD POLICY ISSUES AND THEIR MANAGEMENT

A. Summary of Key Safeguard Issues

1. Describe any safeguard issues and impacts associated with the proposed project. Identify and describe any potential large scale, significant and/or irreversible impacts:

Based on the experience of the parent project, the rehabilitation of the transmission and distribution lines lead to negative environmental and social impacts, including : (i) the effects of noise to residential areas ; (ii) liquid waste (e.g.



waste oils) pollution to surrounding areas and groundwater ; (iii) occupational health and safety hazards impacts to employees that are not equipped with appropriate protective materials ; (iv) accidental hazards associated with machinery; (v) temporary displacement or loss of income of approximately 730 households during replacement of rotten wooden poles; (vi) hazardous solid waste from old transformers.

In addition to these potential impacts, small hydropower projects, when they materialize, could (i) alter hydrology, thereby affecting environmental flows, aquatic ecosystems and downstream water users; (ii) affect the rights and well-being of forest-dependent people; and (iii) create potential fortuitous discoveries of physical cultural resources during the implementation of civil works of small hydropower plants.

2. Describe any potential indirect and/or long-term impacts due to anticipated future activities in the project area:

The Project will not create any indirect environmental or social negative impacts. No potential large scale, significant, and/or irreversible impacts are anticipated during the project. Impacts of future hydropower investments are expected to be better managed and mitigated as a direct result of the current AF since capacities at all levels will be reinforced.

3. Describe any project alternatives (if relevant) considered to help avoid or minimize adverse impacts.

There are 17 sites considered under the AF which will be developed based on their technical, financial, and environmental and social soundness. Any category A hydro subproject will be screened out and will not be financed by the AF.

4. Describe measures taken by the borrower to address safeguard policy issues. Provide an assessment of borrower capacity to plan and implement the measures described.

For the AF, the ESMF and RPF of the parent project have been updated with the assistance of environmental and social consultant and will be implemented by JIRAMA and MEEH. These safeguard documents will ensure compliance with World Bank Safeguard Policies and Malagasy Environmental Law (MECIE Decree). The revised ESMF includes: (i) the three policies triggered in parent project (OP 4.01, OP 4.11 and Op 4.12) and the three additional policies triggered (OP 4.04, OP 4.36 and OP, 4.37); (ii) clear screening process to review and prepare the environmental and social assessment and risk evaluations of small hydropower, (iii) ToRs for the elaboration of standalone Environmental and Social Impact Assessments (ESIA) for small hydropower, (iv) eligibility criteria to not select category A subproject , (v) summary descriptions of environmental and social aspects of potential small hydropower, (vi) ToRs to prepare the ESIA's for the small hydro project to be selected; (vii) generic dam safety measures designed by qualified engineers with potential adverse impacts to be addressed through OP 4.01 using active project in Madagascar as reference (<http://documents.worldbank.org/curated/en/377391484072629188/Élaboration-d-un-manuel-de-gestion-et-de-securite-des-petits-barrages>).

The Resettlement Policy Framework (RPF) of the parent project sets the basic principles and procedures that the Borrower must follow to mitigate any potential adverse social impacts associated with the small hydro. The RPF will be updated by the Borrower because some project activities may lead to the acquisition of land, loss of assets and/or means of livelihood that could result in the permanent or temporary loss of incomes. The RPF includes detailed information on legal and institutional framework, eligibility criteria, asset evaluation methods, implementation arrangements, grievances redress mechanism, and the resettlement budget (fully covered by the Government), and monitoring and evaluation. The RPF contains the basic principles and procedures/directives to be followed by the Borrower for the preparation of the Resettlement Action Plan (RAP) once the physical locations of the proposed projects are known. The result of socio- economic studies have characterized different forms of compensation. Since the technical studies of activities under component 1 will be prepared or updated when the financing is available, the RPF has proposed specific



RAP ToR for each group of activities that JIRAMA could launch in parallel with the technical studies. The Malagasy Government would finance the costs of resettlement (e.g. land acquisition costs; compensation on crops, trees, shelter, structures, etc.) by providing approximately US\$ 60,500 to the RAPs.

The AF project will develop a specific, transparent and accessible grievance redress mechanism. The project will periodically report information related to grievances received and treated by the project. The GRM is integrated into the operational manual of the project and into the ESMF/CPR/PARs.

During the implementation of activities under the component 3, the project will develop a plan for specific actions to prevent and to address possible Gender based violence (GBV) potentially caused by the mobilization of workers.

JIRAMA has an operational Environment and Risk Prevention Department, with eight full time staff. This unit is responsible for the daily management of environmental and social safeguard. It is supported by a consultancy firm to prepare the required safeguard instruments. During the implementation of the parent project, JIRAMA has been actively responsive in addressing safeguards issues. The AF will provide financing to hire an international firm with technical, commercial, environmental, social and legal experts to assist the GoM and JIRAMA to complete feasibility studies and ESIA's of eligible small hydro projects. This department will supervise and review the ESMP/RAP prepared by the consultancy firm to ensure that the mitigation measures are being effectively implemented, and will conduct field visits on a regular basis. Progress Reports (PR) will be produced to document the implementation progress. The MWEH and JIRAMA will ensure that private partners would comply with environmental and social safeguard requirements.

5. Identify the key stakeholders and describe the mechanisms for consultation and disclosure on safeguard policies, with an emphasis on potentially affected people.

During the preparation of the revised ESMF and RPF for this AF, the GoM and JIRAMA, and the concerned Regional Departments with the support of the consultancy firm have conducted extensive public consultations with wide range of stakeholders (e.g. local populations, small producers, rural and urban mayors, local NGOs) and meetings on the project zones in the regions to take into account the views of local populations and communities on the project activities and impacts.

During the implementation of the parent project and the preparation of stand-alone environmental and social safeguards instruments (ESMP/RAP) for the selected subprojects, JIRAMA has conducted large public consultations to consult project-affected groups, and local governmental and nongovernmental organizations on all environmental and social aspects of the project. This practice will be maintained for the AF activities.

The draft revision of ESMF and RPF were received by the Bank on March 13, 2018 and were approved by the Bank on April 19, 2018. The ESMF and RPF were disclosed in the country on April 19, 2018 and on World Bank's external website on April 19, 2018, in compliance with the World Bank disclosure and national policies.

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B. Disclosure Requirements (N.B. The sections below appear only if corresponding safeguard policy is triggered)

Environmental Assessment/Audit/Management Plan/Other

Date of receipt by the Bank March 13, 2018	Date of submission for disclosure April 19, 2018	For category A projects, date of distributing the Executive Summary of the EA to the Executive Directors
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"In country" Disclosure

April 19, 2018

Resettlement Action Plan/Framework/Policy Process

Date of receipt by the Bank March 13, 2018	Date of submission for disclosure
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"In country" Disclosure

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C. Compliance Monitoring Indicators at the Corporate Level (to be filled in when the ISDS is finalized by the project decision meeting) (N.B. The sections below appear only if corresponding safeguard policy is triggered)



CONTACT POINT

World Bank

Miarintsoa Vonjy Rakotondramanana
Senior Energy Specialist

Massan Elise Akitani
Senior Energy Specialist

Borrower/Client/Recipient

Ministry of Budget and Finance
Vonintsalama ANDRIAMBOLOLONA
Minister

Implementing Agencies

JIRAMA
Xavier RAKOTOZAFY
Mr.
deel@jirama.mg

Ministry of Energy and Hydrocarbons
Marc RAKOTOFIRINGA
Mr.
meeh.dge@gmail.com

FOR MORE INFORMATION CONTACT

The World Bank
1818 H Street, NW
Washington, D.C. 20433
Telephone: (202) 473-1000
Web:



APPROVAL

Task Team Leader(s):	Miarintsoa Vonjy Rakotondramanana Massan Elise Akitani
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Approved By

Safeguards Advisor:		
Practice Manager/Manager:		
Country Director:		

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