



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

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Appraisal Stage | Date Prepared/Updated: 08-Jan-2019 | Report No: PIDISDSA23533



**BASIC INFORMATION**

**A. Basic Project Data**

Country Madagascar	Project ID P163870	Project Name Madagascar - Least-Cost Electricity Access Development Project - LEAD	Parent Project ID (if any)
Region AFRICA	Estimated Appraisal Date 14-Jan-2019	Estimated Board Date 28-Feb-2019	Practice Area (Lead) Energy & Extractives
Financing Instrument Investment Project Financing	Borrower(s) REPUBLIC OF MADAGASCAR	Implementing Agency JIRAMA, Ministère de l'Eau, de l'Energie et des Hydrocarbures	

Proposed Development Objective(s)

The Project Development Objective is to increase access to electricity services for households, enterprises, and health facilities in Madagascar.

Components

- Grid Electrification
- Off-grid Electrification
- Technical Assistance and Implementation Support

**PROJECT FINANCING DATA (US\$, Millions)**

**SUMMARY**

<b>Total Project Cost</b>	150.00
<b>Total Financing</b>	150.00
<b>of which IBRD/IDA</b>	150.00
<b>Financing Gap</b>	0.00

**DETAILS**

**World Bank Group Financing**



International Development Association (IDA)	150.00
IDA Credit	150.00

Environmental Assessment Category

B-Partial Assessment

Decision

The review did authorize the team to appraise and negotiate

**B. Introduction and Context**

Country Context

**1. Madagascar is a low-income country of 25 million people and a gross domestic product (GDP) of about US\$10 billion (2017), which has been on a declining development trend for several decades.**

As of 2012, approximately four-fifths of Malagasy live in extreme poverty, while over 90 percent live under the general poverty line, defined as per capita purchasing power of under US\$1.90 and US\$3.10 per day, respectively. The average Malagasy is 42 percent poorer today than he/she was in 1960,<sup>1</sup> the year of Madagascar’s independence. According to the Human Capital Index<sup>2</sup>, a child born in Madagascar today will be 37 percent as productive when she grows up as she could be if she had enjoyed complete education and full health. Madagascar is also highly vulnerable to natural disasters, including cyclones, droughts, and flooding. Madagascar’s challenging topography, mostly characterized by thin coastlines separated by a rugged high plateau cut by deep gorges and waterfalls, significantly complicates the establishment of regional transport infrastructure and interconnected power grids.

**2. The country’s development vision, laid out in the NDP 2015–2019, is aligned with the multidimensional approach to development set by the UN Sustainable Development Goals (SDGs).**

National reconciliation, reinforcement of democratic institutions, and a better management of the economy—these high-level objectives for 2019 rely on progress in reinforcing the rule of law, improving governance (also at the local level), ensuring a stable macroeconomic framework, promoting inclusive growth in combination with poverty reduction, investing in human capital, and valorizing natural resources of the country. Mining, tourism, agriculture, and fisheries, helped by comprehensive infrastructure development, are identified as the key productive sectors expected to fuel growth with spillovers for the overall economy. The NDP is the Government’s medium-term planning tool to progress on the overarching ambition of the General Policy of the State (Politique Générale de l’Etat)

<sup>1</sup> Measured in real GDP per capita. Only the Democratic Republic of Congo and Liberia fared worse than Madagascar over 1960–2010.

<sup>2</sup> Madagascar ranks 140 out of 157 economies.



to transform Madagascar into a modern and prosperous nation, characterized by sound governance, strong and stable growth, and wide access to high-quality public services.

3. **Madagascar’s fiscal space to achieve its development objectives is compromised by subsidies to state-owned enterprises, including in the power sector.** Tax revenue, as a share of GDP, has historically been among the lowest in the world, with a low point of 9.9 percent of GDP in 2014 and reaching a projected 12.1 percent in 2018 after three years of reform efforts. Strategies for increasing tax revenue have been elaborated and efforts are under way, but they have yet to produce concrete results. Furthermore, the Government still allocates a large share of discretionary spending to unaffordable and poorly targeted fuel subsidies and transfers (estimated at 4.1 percent of GDP in 2017), mostly to finance the losses of troubled state-owned companies including, most importantly, Madagascar’s Electricity and Water Utility (Jiro sy Rano Malagasy, JIRAMA), the public water and electricity utility (estimated at 1.2 percent of GDP in 2017). The constraints of the Government’s fiscal space in combination with legacy distortions from the transition period continue to limit the administration’s margin of maneuver for infrastructure investment, particularly in the power sector.

#### Sectoral and Institutional Context

4. **Public electricity service in Madagascar is provided by JIRAMA, a vertically integrated state-owned utility that operates most of the country’s grid infrastructure.** Grid-based electricity in three larger networks covering the major urban centers of Antananarivo, Toamasina, and Fianarantsoa is provided by JIRAMA, which is responsible for distribution, transmission, and roughly half of generation. JIRAMA also owns and operates (along with the Rural Electrification Agency [Agence de Développement de l’Electrification Rurale, ADER]) about 130 isolated mini-grids. The Ministry of Energy and Hydrocarbons (Ministère de l’Eau, de l’Energie et des Hydrocarbures, MEH) sets government policy and provides strategic coordination of the energy sector and oversight of JIRAMA’s electricity sector activities. The Electricity Sector Regulator (Autorité de Regulation de l’Electricité, ARELEC) regulates tariffs and market entry. ADER is responsible for rural electrification through grid extension and/or off-grid and mini-grid systems. Other important sector agents include private companies that supply power to JIRAMA under independent power producer (IPP) and rental power arrangements. The current legal and regulatory framework of the sector was developed in the last decade, starting with the Electricity Law of 2000 and its regulations, which provided for private investment in the sector.

5. **The proposed project supports the implementation of the GoM electrification agenda, laid out in the 2015 New Energy Policy (NEP), which aims to raise electrification to at least 70 percent by 2030 and make progress towards SDG73 through both grid and off-grid solutions.** The GoM’s new electrification policy framework under the NEP is underpinned by three principles: (a) ‘Least Cost’—the electrification of specific sites and localities to make use of the most economical technology option for providing the needed minimum service level and resulting economic benefits, (b) ‘Grid-based renewable energy solutions’—the prioritization of grid-based renewable energy solutions, (c) ‘Social justice’— introduction of the notion of modern lighting solutions as economically and financially viable

<sup>3</sup> <https://sustainabledevelopment.un.org/sdg7>.



means to accelerate efforts to reduce inequality and close the persistent gap between urban and rural electricity services. In terms of grid access, the project follows a least-cost approach guided by geospatial analysis to maximize the number of new connections.<sup>4</sup> The GoM acknowledges that this approach will necessarily involve the large scale deployment of off-grid solutions to serve the millions of households residing in large areas of the country that will likely remain beyond the technical and economic reach of both national grid and mini-grid schemes.

**6. Informed by the geospatial analytics used to optimize the use of different supply technologies to expand electricity access, the project will have a strong focus on expanding off-grid electrification technologies.** The first is the National Electrification Strategy (NES). Supported by the IDA-funded “Electricity Sector Operations and Governance Improvement Project” (ESOGIP, P151785), the Government’s recently approved National Electrification Strategy (NES) defines the technical, financial, and institutional key parameters of the GoM’s electrification approach. In line with the directives of the NEP, the NES attributes a strong priority to support the development of rural growth poles and lays out a least-cost electrification strategy that relies significantly on off-grid technologies. The second is geospatial planning and analysis. Supported by the World Bank, the deployment of geographic information system (GIS) planning tools has enabled the identification of least-cost technology solutions for electrification based on the location of demand centers. The GIS tools determine how to optimally expand the electrical grid while identifying potential locations for economically viable mini-grid sites and suggesting priority focus areas for private sector stand-alone solar companies. A country-wide high-level geospatial analysis identifying optimal technologies for different regions has already been performed by the Royal Institute of Technology (Kungliga Tekniska Högskolan, KTH). The results from this ‘high-level least-cost snapshot’ show that optimally, about 75 percent of new connections under the NEP should be provided through the large-scale deployment of off-grid technologies with a total of US\$2 billion of investments mostly in mini-grids and stand-alone solar devices (see Figure 1). Interestingly, diesel-powered mini-grids, with their high operating costs, are completely absent in the least-cost scenario for 2030 while grid-based electrification plays a secondary role with only 25 percent of new connections or a total investment of US\$1.2 billion by 2030. Nonetheless, grid connections constitute the least-cost solution in the central and northern parts of the country due to the existence of basic grid infrastructure in the Antananarivo, Fianarantsoa, and Toamasina central areas and the ongoing expansion of the northern grids including Mahajanga, Antsiranana, Nosy Be, and Sambava. A more detailed follow-up study, which will allow for planning and prioritization of specific grid extension projects, is currently under preparation. The third is an off-grid market assessment study. Supported by the World Bank, this study mapped out areas that could be served by off-grid solutions; estimated the size of the potential commercial off-grid market through countrywide household and SMEs surveying; took stock of electricity access and energy needs in social institutions (for example, schools and clinics);

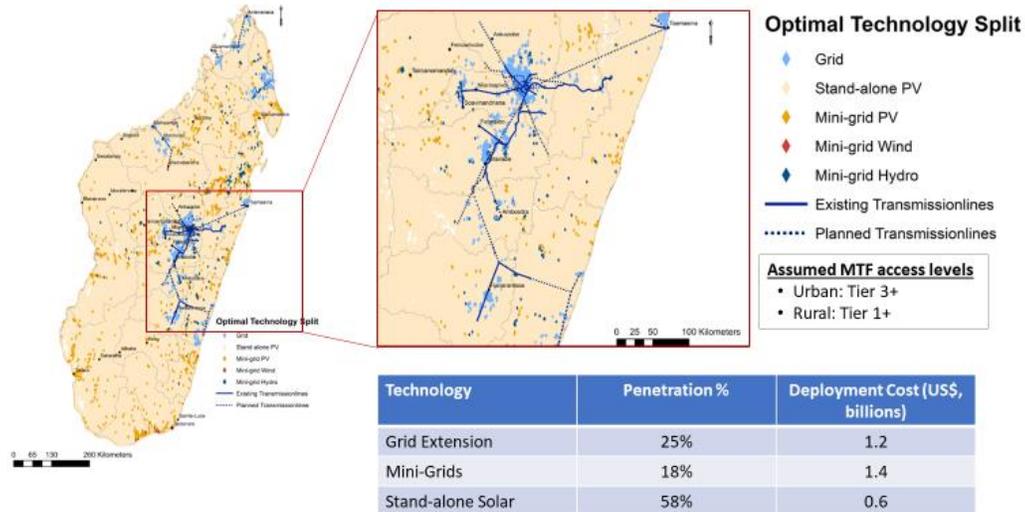
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<sup>4</sup> Achieving SDG7 (universal access to electricity) by 2030 requires a dramatic increase in the number of new connections per year (an average of 420,000 new connections added per year through 2030). By comparison, over the past decade, JIRAMA has never managed to connect more than 20,000 new customers. These numbers illustrate the need for a profound paradigm shift in the way electrification efforts are planned and implemented.



identified barriers/risks across the local OGS value chain; and reviewed the regulatory structure as it pertains to the products and range of distribution models.

Figure 1. Results of 2030 Geospatial Least-Cost Electrification Analysis

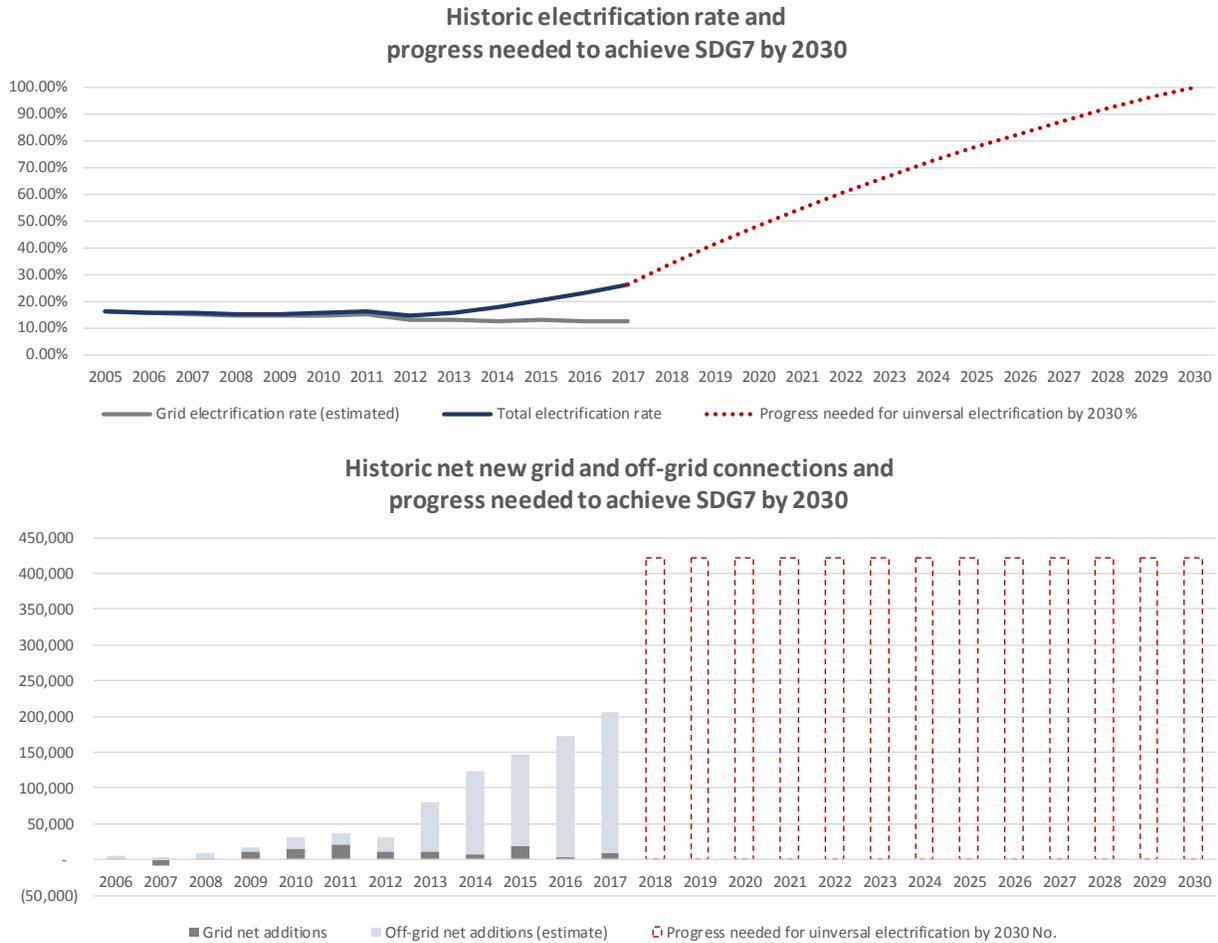


Source: KTH (2018).

7. **Stand-alone off-grid solar (OGS) systems, distributed and operated by the private sector, have started filling the service gap left by the slow expansion of public electricity service in Madagascar and are now estimated to already serve almost as many households as the grid.** Household surveys conducted as part of the Enquête sur les Indicateurs du Paludisme (EIPM) suggest that about 10 percent of the population, or around 560,000 households, had access to electricity through off-grid energy systems in 2016. The survey data show a recent uptick in self-reported access to electricity from 12.9 percent to 22.9 percent between 2013 and 2016 (when the most recent EIPM was conducted), especially in rural areas, while the rate of grid-based access declined slightly between 2011 and 2016. This development is consistent with what has been observed throughout East Africa, where increasingly affordable household off-grid systems became available over the past decade. The market study completed as part of the preparation of this project estimated that around 830,000 solar systems have been sold in Madagascar to date, which appears consistent with EIPM data, especially if continued growth after 2016 is assumed. However, quality and after-sales service of the market are still underdeveloped, and the footprint of OGS providers in remote areas of the country is extremely limited (most systems are sold to higher-income households in cities and rural towns). The market study has also shown that given the consumption patterns and willingness to pay of the overwhelming majority of rural Malagasy households, the current off-grid technology including Pico Solar and solar home systems (SHSs) can provide the same or better electricity service quality than mini-grids or grid connections at a fraction of the cost.



Figure 2. Historic Progress in Electrification in Madagascar and Future Progress Needed to Achieve SDG7 (Universal Access to Electricity) by 2030



Source: World Bank staff estimates based on data from JIRAMA, ARELEC, and the National Institute of Statistics (*Institut National de la Statistique*).

8. Targeted government support under the proposed project will be critical to generate momentum in the high-quality OGS market and overcome market failures relating to product quality and access to consumer finance. The market study identified that low-quality imitation products are undermining consumer confidence. At appraisal, only two businesses were identified as consistently selling Lighting Global-verified<sup>5</sup> products, Baobab+ and HERi. Baobab+ grew out of Microcred, a pan-African microfinance institution (MFI) headquartered in France, and offers Tier 1 Greenlight Planet Sun King systems to consumers on a pay-as-you-go (PAYGO)

<sup>5</sup> Lighting Global is the World Bank Group's platform to support sustainable growth of the global off-grid lighting market (<https://www.lightingglobal.org/>). Lighting Global maintains quality standards that set a baseline level of quality, durability, and truth in advertising to protect consumers. Meeting the standards is a requirement for participation in Lighting Global support programs.



basis in multiple francophone African countries. HERi operates a micro-franchise kiosk model, in which local women entrepreneurs run solar-powered community kiosks that offer lanterns and small SHSs on a rental basis—it is also preparing to launch PAYGO sales of pico-PV products. In parallel, the mobile telco, Orange, has launched a pilot offering d.light SHSs on a rental basis (that is, the ‘solar as a service’ model), and its primary competitor, Telma, is considering entering the market through a PAYGO approach. In cooperation with local microfinance providers, both operators plan to drive sales through their own mobile money-based payment and consumer financing platforms. The market study identified the following principal barriers to growth: (a) low purchasing power among consumers, exacerbated by the limited availability of consumer finance and underdeveloped MFI sector; (b) lack of access to small and medium enterprises (SMEs) finance for solar distributors to purchase inventories and smooth working capital cycles; (c) high costs of rural distribution due to Madagascar’s large size, low population density, and poor transport infrastructure; (d) complex customs procedures and inconsistent application of value added tax (VAT) exemption incentives for solar products; (e) lack of differentiation of fiscal incentives between low- and high-quality products; (f) lack of local human capital to fill management and key technical positions; and (g) limited awareness among both the public and policy makers of the importance of quality in solar products, how to identify quality, and the value of comprehensive after-sales service offerings.

9. **In parallel, the proposed project will support grid densification in urban and peri-urban areas and grid extension in rural areas with a focus on maximizing the number of households connected.** The potential for grid densification, which can be achieved at a comparatively low cost per connection, is highest in urban areas, where over half of the population is without electricity access despite their relative proximity to the grid. Investments in rural areas will have to include significant expansion of the medium-voltage (MV) and low-voltage (LV) grid, as currently less than 10 percent of the rural population is connected. This is due in part to the country’s high poverty levels and low population density outside urban areas. Of the households in the bottom income quintile—most of whom live in rural areas— currently just 1 percent have access to grid electricity.<sup>6</sup> Electrification efforts in this context are particularly challenging given the difficulty of recouping the relatively high costs of grid extension from a large majority of low-income households that typically consume only small amounts of power. These circumstances, in combination with the adverse effects of the political crises of 2002 and 2009 and the general deterioration of JIRAMA’s financial situation, are why the country has made very little progress in electrification since the early 2000s and continue to present severe challenges for the traditional (grid-based) electrification approach. The proposed project will provide resources to accelerate grid electrification through targeted investments in grid densification and extension, with a focus on maximizing the number of households connected.

10. **JIRAMA’s financial performance will continue to be the key obstacle to grid densification and extension efforts.** The utility’s financial health has significantly declined over

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<sup>6</sup> World Bank staff analysis of household surveys.



the past decade, leaving insufficient resources to invest in access expansion. Between 2008 and 2015, tariff revenues fell from US\$0.20 per kWh to US\$0.12 per kWh in nominal terms, bill collection fell from an average of 95 percent in 2007–2009 to 79 percent in 2014–2016, and the financial cost of service increased from US\$0.20 per kWh to US\$0.22 per kWh despite falling global oil prices as the share of expensive thermal power production increased from 11 percent to over 40 percent today. Government transfers, while significant,<sup>7</sup> fell short of closing the cash flow gap. As a result, JIRAMA's cost recovery rate (based on cash collected) fell from 84 percent to 47 percent, its operating margin declined from 13 percent to –59 percent, and its liabilities climbed from 1.3 percent of GDP to 5.6 percent of GDP. The precarious financial situation left JIRAMA unable to invest in and maintain its infrastructure. Between 2008 and 2015, system losses rose from 23 percent to 34 percent, the availability of installed generation capacity declined from 71 percent to 55 percent, and its reserve margin fell from +35 percent to –5 percent. Barely able to maintain its existing service level, investment in access expansion has been deprioritized, leading to a decline in the grid access rate as population growth outpaced new connections. Between 2008 and 2015, JIRAMA completed only around 12,000 connections per year, falling far short of the growth in the number of households of about 130,000 per year. The result is that the grid access rate declined from 15 percent in 2008 to 13 percent in 2015.

**11. Therefore, the proposed project is closely linked to multiple concurrent World Bank efforts to improve JIRAMA's operational performance.** A Government reform program initiated in 2015 under the NEP has halted the downward trend of JIRAMA's performance but has not yet been successful in accelerating access. The NEP aims to put the sector on a sustainable path, to be achieved through a series of tariff reforms, utility modernization measures, and sector governance reforms that started in 2016<sup>8</sup> with support from the World Bank-funded Electricity Sector Operations and Governance Improvement Project (ESOGIP, P151785). Under ESOGIP, the Government of Madagascar (GoM) restructured JIRAMA and completed the competitive hiring of new senior management in 2017, and provided funding to reduce commercial losses through improved metering and billing mechanisms, conduct a detailed tariff review to better align pricing with customer consumption profiles and service costs, adoption of a least-cost development plan (PDMC), improve operational efficiency by streamlining JIRAMA's administrative cost base, and reduce technical losses through rehabilitation and reinforcement of urban MV/LV infrastructure. In addition, to increase available generation capacity and reduce costs in the short term, ESOGIP is currently supporting the reconversion of diesel to heavy fuel oil while the ongoing Scaling Solar Program is expected to further reduce JIRAMA's dependence on expensive thermal power in the medium term. These efforts will be complemented by World Bank-executed technical assistance supporting JIRAMA in the development and implementation of a detailed financial recovery plan. These interventions are starting to show results. Since 2015,

<sup>7</sup> Over 2014–2017, fiscal resources equivalent to an estimated 4.4 percent of GDP have been transferred from the Government budget to JIRAMA to compensate for the financial hemorrhage. The power sector's contribution to the Government's quasi-fiscal deficit reached 2.15 percent of GDP in 2016.

<sup>8</sup> These measures were also seen as critical in the Systematic Country Diagnostic (SCD, Report No. 99197) and the Country Partnership Framework (CPF, Report No. 114744-MG).



five tariff reforms raised seasonally adjusted revenues in the first two months of 2018 to 46 percent above the level of 2015 and 23 percent above the level of 2016. In parallel, the GoM scaled up its budget transfers to 1.3 percent of GDP in 2017 to cover the utilities' cash deficit and slow down the accumulation of arrears to suppliers. As a result, JIRAMA's operating margin improved from -59 percent in 2015 to -12 percent in 2017. System losses started recovering from a decade-long downward trend, reaching an average of 32 percent over 2016–2017 compared to 34 percent in 2015.<sup>9</sup> However, further measures by the Government are urgently needed as JIRAMA's costs have continued to rise as a result of the utility's ever-increasing reliance on expensive rental power (reaching 64 percent of available generation capacity and 38 percent of production in Q3 2018) and higher oil prices, reaching US\$0.32 per kWh in 2017. JIRAMA's cost recovery rate (based on cash collected) fell further from 47 percent to 34 percent between 2015 and 2017. The resulting cash shortfall has led to a further decline in new connections completed, which averaged just 7,000 in 2016–2017 (bringing the total to just over 500,000), and the grid access rate fell further from 13 percent in 2015 to 12 percent in 2017 (less than half the average of Sub-Saharan Africa). By contrast, an estimated 420,000 new connections per year will be required to meet the GoM's target of 70 percent access by 2030 (see Figure 2).

**12. Complementing JIRAMA's grid expansion, the GoM has been granting mini-grid concessions to private operators to electrify rural villages since 2004, but so far, these cover only a very small fraction of the population.** Thirty organizations now operate mini-grids that provide electricity to around 200 villages, serving approximately 7,000 consumers in total. They generate power using diesel, biomass, or small hydro generators with capacities ranging from 40 kW to slightly more than 200 kW. The majority obtained their authorization contracts through bottom-up proposals to ADER, as allowed under the law. Now, with the costs of solar photovoltaic (PV) hardware, battery storage, and metering technology dropping precipitously, there are opportunities to hybridize and densify existing systems and build new solar-powered mini-grids that could promote both rural economic development and electricity access. However, to date, and despite falling technology cost, the construction of new mini-grids is still significantly hampered by the high and often prohibitive cost of connections resulting from the need to build expensive distribution networks for small numbers of poor customers living in sparsely populated regions.

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<sup>9</sup> Under the ongoing IDA-funded ESOGIP, JIRAMA has also started implementing a new commercial management system to improve billing and collection performance and is rehabilitating some of the most overloaded transmission lines. However, the benefits of improved customer management will only materialize gradually from Q1 2018 on, and far more investment will be needed to upgrade sector infrastructure and reverse the continued aggravation of technical losses and system outages.



### C. Proposed Development Objective

Development Objective(s)

13. The Project Development Objective is to increase access to electricity services in Madagascar.

Key Results

14. The PDO-level results indicators are the following:

- (a) People provided with new or improved electricity service (CRI, Number);
- (b) Enterprises provided with new or improved electricity services (Number);
- (c) Critical service facilities provided with new or improved electricity services (Number).

### D. Project Description

15. **The proposed project will support the GoM's key energy policy objective, 'to guarantee universal access to reliable, sustainable, and modern energy services at affordable cost'.** This is in line with the strategic priorities and implementation approach of the GoM's electrification policy framework and the technical, financial, and institutional parameters currently defined in the NES. Through the extensive use of geospatial analysis and land-use planning tools, the project aims to maximize the number of households provided with electricity services while fostering local economic industrial development as well as attracting private investment.

16. **Consistent with the implementation approach of the NEP to prioritize socially equitable and grid-based renewable energy solutions at least cost, the project will consist of the following components (see Error! Reference source not found.):**

- **Component 1** will finance cost-effective, priority investments in grid extension and densification to connect households, enterprises, and health facilities. The component separates funding for grid densification (mostly in urban and peri-urban areas) and grid extension (mostly in rural and peri-urban areas) in line with the NEP priorities and JIRAMA's grid extension plan.
- **Component 2** will engage financial institutions, OGS companies and contractors to scale up the rollout of stand-alone solar PV systems for households, enterprises, and health facilities. This will expand access to electricity to lower-income households and areas that do not have sufficient density or load diversity to justify grid or mini-grid extension given prevailing costs or those that are simply too far from the existing grid or mini-grid network.
- **Component 3** will assist the MEH, ADER, JIRAMA, and ARELEC in building technical expertise and operational capacity of their staff and help the four agencies devise enabling policies and regulatory frameworks to further their respective mandates. Therefore, the



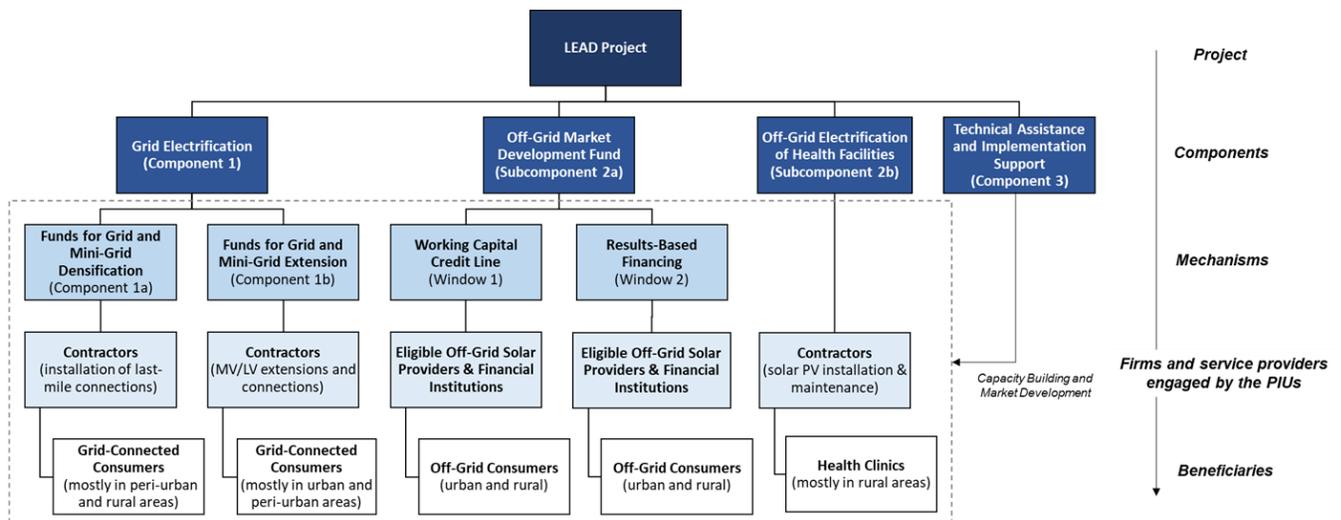
component will provide a broad range of technical and financial support in access planning, implementation support, and capacity-building activities. The component will also fund consumer awareness and citizen engagement and market development activities for the OGS market.

### E. Implementation

#### Institutional and Implementation Arrangements

17. **Project implementation and oversight.** The project’s overall coordination and oversight will be ensured by the MEH, while JIRAMA’s existing PIU for ESOGIP will implement Component 1, and the ESOGIP PIU created within the MEH will implement Components 2 and 3. Both existing PIUs will be reinforced to meet the increased workload. The MEH has gathered substantial implementation experience with the ongoing ESOGIP, though its implementation capacity has been weakened by a recent reshuffling of senior staff. Therefore, the recruitment of a dedicated project coordinator and fiduciary staff familiar with World Bank procurement and financial management (FM) procedures will be necessary. ADER’s role will be to ensure the market supervision and consumer protection mandate of the sector regulator ARELEC for the off-grid segment of the power sector.

Figure 3. Project Structure and Components



Source: World Bank staff; PIU = Project Implementation Unit.



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

National Level: The environmental and social risks of the proposed project are considered ‘substantial’ because of its wide geographical scope in rural and sub-urban areas at national level and the type of investments it will support. In fact, JIRAMA has prepared a tentative long-list of priority investments for grid extension and reinforcement of existing distribution infrastructures, upgrading or constructing substations covering 85 rural and peri-urban districts close to either the main grid or local JIRAMA-operated mini-grids under component 1. In component 2, it is proposed to expand off-grid electricity access for households, health facilities, enterprises, and community facilities if unlikely to be connected to the national grid in the medium to long term.

**G. Environmental and Social Safeguards Specialists on the Team**

Paul-Jean Feno, Environmental Specialist  
Andrianjaka Rado Razafimandimby, Social Specialist

**SAFEGUARD POLICIES THAT MIGHT APPLY**

Safeguard Policies	Triggered?	Explanation (Optional)
Environmental Assessment OP/BP 4.01	Yes	This policy is triggered because the proposed activities will potentially induce adverse environmental and social impacts as a result of the investments in grid extension and densification namely the reinforcement of existing distribution infrastructures, upgrading or construction of substations under Component 1, and expanding off-grid electricity access for households, health facilities, enterprises, and community facilities under Component 2. The infrastructures in Component 1 to be implemented by JIRAMA may result in both direct and indirect environmental and social impacts mainly during the civil works (community health and safety risks such as the increased STD/AIDS transmission risks as a result of the number of workers during the civil works, the local recruitment, accident risks, Sexual Exploitation and Abuse (SEA) risks land acquisition and resettlement and economic displacement ...etc.). For those proposed



investments, the technical studies need to be prepared or updated during the first year of implementation hence the precise locations and potential impacts of future sub-projects cannot be identified at appraisal.

Activities under Component 2 could generate low and temporary impacts, accident risks and production of obsolete batteries and electronic waste from. Environmental and public health risks might arise from improper disposal of SHS batteries. To reduce these risks and adverse environmental and social consequences and meet triggered safeguard policy requirements, the Borrower has engaged a consultant firm to develop an Environmental and Social Management Framework (ESMF). The ESMF has been approved by the Bank and disclosed in country and on the Bank’s Website.

Performance Standards for Private Sector Activities OP/BP 4.03	No	Not applicable
Natural Habitats OP/BP 4.04	No	Current land uses in the project's potential intervention areas show residential and industrial zones with medium to small scale of public infrastructures where the ecological value is low without sensitive areas. In addition, the investments in grid extension and densification including reinforcement of existing distribution infrastructures, upgrading or construction of substations will be on existing public roads and along of roads/feeder roads.
Forests OP/BP 4.36	No	There are no forests and forest areas in the project areas. The current land occupation picture shows human settlements and degraded land and agricultural zones in the surrounding areas.
Pest Management OP 4.09	No	The project will use power poles without using pesticides.
Physical Cultural Resources OP/BP 4.11	Yes	No archaeological vestiges will be impacted following the socio-economic survey developed in the ESMF. However, to address potential cultural heritage issues related to graves or sacred natural assets during grid extension and densification civil works, a “Chance-Finds” approach, embedded in the ESMF has been adopted to ensure adequate management of such encounter.



Indigenous Peoples OP/BP 4.10	No	This policy is not triggered as there are no indigenous Peoples in Madagascar that meet the criteria of OP 4.10.
Involuntary Resettlement OP/BP 4.12	Yes	Site preparation and construction of new substations and distribution lines could affect around 875 households through the partial loss of land, partial loss of cropland, the loss of property (boxes, kiosks, pavilions, fixed stalls, fences, ...), temporary loss of sources of income or livelihood due to temporary cessation or temporary or permanent displacement of activities (based on information from the current Resettlement Policy Framework (RPF). Since the physical locations of these proposed activities are unknown at this stage and will be designed during the first year of project implementation, the Borrower has prepared a detailed RPF. The RPF sets forth the basic principles and procedures to be followed by the Borrower for the preparation of a RAP mainly for the component 1 once the physical locations of the proposed activities are known. The Resettlement Policy Framework has been reviewed and disclosed in country and on the Bank's Website.
Safety of Dams OP/BP 4.37	No	The Project is not financing any activities related to dams. This policy is not expected to be triggered by any of the Project activities.
Projects on International Waterways OP/BP 7.50	No	Madagascar is an Island. The policy on Projects on International Waterways is not triggered given location and potential impact of the Project.
Projects in Disputed Areas OP/BP 7.60	No	There are no disputed areas associated with the Project.

**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:

Environmental and social risks and impacts of the proposed operation are considered "Substantial": The project has a large geographical scope including rural and urban areas nationwide, but JIRAMA's Environment Department is experienced in implementing Bank funded-investments through the ongoing MG-Electricity Sector Operations & Governance Improvement Project (ESOGIP, P151785).

The project is classified as Category B and three Environmental and Social Safeguard Policies are triggered: OP/BP 4.01



(Environmental Assessment); OP 4.11 (Physical Cultural Resources); and OP/BP 4.12 (Involuntary Resettlement). In fact, the project design initially approved in February 2018 has been modified several times to simplify its activities, namely that the project will not build new transmission lines. Therefore, the safeguards category has been downgraded from A at concept stage to B at appraisal.

The project is committed to complying with all triggered safeguards policies and preparing the required safeguard instruments. Activities under Component 1 (investments in grid extension; densification and reinforcement of existing distribution infrastructures; upgrading or constructing substations) will be in residential and industrial zones without any environmentally sensitive areas such as wetlands or forests. The areas selected from JIRAMA's long list are located in areas with no sensitive habitat or high biodiversity. However, component 1 could potentially induce risks and adverse environmental and social impacts, including the effects related to: general nuisances such as noise, dust, and vibration; community health and safety risks such as increased HIV/AIDS transmission; risks related to the influx of workers and local recruitment, gender-based violence (GBV), sexual exploitation abuse (SEA) risks; increased risk of accidents during civil works; environmental and public health risks from improper disposal of solar home system batteries or old generators with PCB; and harm to potential chance finds of physical cultural resources during the civil works and temporary/ permanent land acquisition and economic displacement. Regarding component 2, funds provided through the OMDF will support the private sector to provide approximately 300,000 households, 2,000 businesses and 500 basic health centers with autonomous rooftop solar photovoltaic system. These activities could generate waste from depleted SHS batteries and accidents during the installation process. To address these risks, environmental and social impacts in compliance with the safeguard policies triggered, the national Environmental Law will be reinforced by World Bank safeguard policies. Within this context, the Borrower has prepared an Environmental and Social Management Framework (ESMF) and Resettlement Policy Frameworks (RPF) as the technical studies that need to be prepared or updated during the first year of implementation as well as the detailed locations of the works proposed for the related investments and distribution lines are not known at this time.

2. Describe any potential indirect and/or long term impacts due to anticipated future activities in the project area:  
No potential indirect and/or long term impacts can be expected due to anticipated future activities in the project area. Overall project risks are considered "Substantial" and will be site-specific and manageable to an acceptable level. The proposed project requires no exceptions to the World Bank's policies on environmental and social safeguards. Potential impacts are related to the civil works.

3. Describe any project alternatives (if relevant) considered to help avoid or minimize adverse impacts.  
There are no alternatives to the present project design.

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.

At the national level, Madagascar has a legislative and regulatory framework which is conducive to good environmental management. JIRAMA with its Environment and Risk Prevention Department has experience in implementing Bank funded investments throughout the current MG-Electricity Sec Operations & Governance Improvement Project (ESOGIP, P151785). The client has been actively responsive in addressing safeguards issues.

To address the safeguard policies issues, the Borrower has prepared an Environmental and Social Management Framework (ESMF) and Resettlement Policy Frameworks (RPF) as the technical studies need to be prepared or updated during the first year of implementation and detailed locations of the works proposed for these investments and distribution lines are not known at the present time.



Environmental and Social Management Framework (ESMF): In compliance with OP 4.01 (Environmental Assessment), an ESMF has been prepared to screen sub-project proposals for environmental, social, gender, and health and safety impacts by using its Environmental and Social Screening Form (ESSF) checklist for component 1 activities. The ESMF has taken into account the environmental and social review and described the environmental and social profiles in the urban and peri urban project target areas. 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). Moreover, ToRs for specific environmental and social studies with the related ESMP for each group of activities that JIRAMA could launch in parallel with the technical studies have been provided. Thus, all contracts to be issued under the project will include the environmental and social clauses annexed in the ESMF necessary to ensure adequate environmental and social management practices during the project implementation phase. Regarding the risks from solid waste under component 1, the assessment of JIRAMA has established that the utility had ceased importing transformers containing PCB since 1985. Moreover, the ongoing ESOGIP project has already put in place action plans for the collection and storage of old transformers in operational secured site In Antananarivo.

With regard to component 2, the project's support for distributors of standalone solar rooftop technology could generate waste in the form of depleted SHS batteries thus creating the need for a nationwide used battery management plan. While Madagascar thus far has no legislation on used battery management, the country could apply international standards as defined by Decree No. 2004-167 of 2004 and Decree No. 99-954 of 1999 on rendering investment compatible with the environment ("Décret Mise en Compatibilité des Investissements avec l'Environnement – MECIE"). Therefore, it was proposed that used batteries will be collected by the private sector (including distributors and resellers), stored in plastic containers in a secure location until a more rational method can be found. This battery management plan will be supervised by the Environmental Unit of the MEH with the support of Ministry of Environment. In addition, the ESMF has proposed specific ESH measures for OGS companies to further reduce the already limited risks of accidents during the mostly "plug-and-play" installation of solar systems. Moreover, private resellers and distributors must have a realistic Environmental and Social Charter to reduce electronic waste and used batteries (batteries and solar panels with long-life cycle) including a Management and Collection Plan for used batteries / used panels with a Communication and Awareness-Raising Plan for the households and enterprises. These approaches are in line with GoM and World Bank policies and guidelines on environmental and social impact management (see the HSE guideline).

For the subprojects that could be financed by the project, the ESMF has analyzed the EHS general and specific guidance that could be applied for the subprojects which are:

Directives générales HSE: [https://www.ifc.org/wps/wcm/connect/00dbdb8048855b7588f4da6a6515bb18/010\\_General%2BGuidelines.pdf](https://www.ifc.org/wps/wcm/connect/00dbdb8048855b7588f4da6a6515bb18/010_General%2BGuidelines.pdf)

Directives on distribution lines: [https://www.ifc.org/wps/wcm/connect/1a00aa0048855d788f0cdf6a6515bb18/004\\_Electric%2BPower%2BTransmission%2Band%2BDistribution.pdf](https://www.ifc.org/wps/wcm/connect/1a00aa0048855d788f0cdf6a6515bb18/004_Electric%2BPower%2BTransmission%2Band%2BDistribution.pdf)

For component 2, the Environmental Unit at MEH with the support of a consultant will ensure the screening of private companies with the screening form in Annex 12 of the ESMF. This assessment will identify eligible private companies with a consistent environmental and social charter.

The ESMF also outlines the importance of developing a strategic approach to deal with cases of GBV, and also developed an operational grievance redress mechanism which will capture and address environmental, social,



governance, and other grievances and negative impacts of the project. Prior to commencement of component 1, and as soon as the implementation sites are identified, each subproject/activity will be screened per the ESSF procedures detailed in Annex 1 of 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); whereas the Resettlement Policy Framework (RPF) will determine the need for preparation of additional Resettlement Action Plans (RAPs). JIRAMA, under its Environment and Risk Prevention Department will be responsible for the procurement of consultants to prepare them, supervise the consultants and it will be responsible for the monitoring of the implementation of the ESMPs and RAPs in the project areas. It will ensure that all contractor contracts include environmental and social clauses, which are attached as an annex to the ESMF, in order to ensure adequate environmental and social management practices during the project implementation phase. These approaches are in line with GoM and World Bank policies and guidelines on environmental and social impact management (see the HSE guideline). The ESMF has included also the sufficient budget to prepare and implement the required ESIA, ESMPs for component 1 and to conduct component 2 activities in compliance with environmental and social measures for a total amount of USD 152, 432 in the project costs.

For OP 4.11 Physical Cultural Resources: Concerning infrastructure to be financed by the project under component 1 (investments in grid extension; densification and reinforcement of existing distribution infrastructures; upgrading or constructing substations) and those under component 2, no archaeological vestiges will be impacted following the socio-economic survey developed in the ESMF. For more assurance, the ESMF has made provisions for cultural resources management in the event the Physical Cultural Resources OP 4.11 is triggered during the implementation phase and includes “chance finds” procedures for inclusion in the contractors’ contract.

Resettlement Policy Framework (RPF): Since the precise locations and potential impacts of future investments in Component 1 cannot be identified at appraisal, an RPF has been prepared to ensure that activities to be financed under the project require involuntary resettlement of local communities are properly managed in compliance with OP 4.12 (Involuntary resettlement) and the related Malagasy legal requirements. Based on the RPF, the project will induce partial loss of cropland, loss of property (boxes, kiosks, pavilions, fences,), loss of sources of income or livelihoods, and could generate potential impact on 875 households (Calculated on the basis of person who can be affected by district as well as following exploitation of similar data from the EGOSIP project), however these potential impacts are expected to be moderate, temporary, and site-specific, and resettlement measures can be readily designed and implemented. 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 specific compensation matrix for the project, (iv) outlined consultation process for the future RAP, (v) defined the grievance redress mechanism (GRM) which will be developed into the project and which will capture all complaints related to the project but not only those from resettlement issues, (vi) has proposed the institutional arrangement for resettlement implementation and also defines M&E approach for resettlement. ). Funds to prepare and implement the RPF and these potential RAPs have been included in the project costs (US\$ 421,470 ).

Monitoring of Environmental and Social Management Framework: The proposed operation will be implemented by JIRAMA for Component 1 and by MEH for component 2. The capacity assessment conducted as part of the ESMF and the RPF concluded that the current environmental and social institutional arrangement to implement component 1 is operational and could be maintained by JIRAMA’s Environment and Risk Prevention Department. The Department gained significant knowledge and experience managing social and environmental safeguards risks with the ongoing ESOGIP operation. The permanent staff of the Department is supported by an environmental consultant firm to prepare of required safeguard instruments for identified subprojects. Under ESOGIP, key instruments such as



Environmental and Social impacts assessments (ESIA) and Resettlement action plans (RAPs) were prepared by JIRAMA in a timely fashion and appropriately implemented by contractors under the supervision of the said Department. It is proposed that the World Bank task team will continue to provide hands-on training in the management of environmental and social safeguards risks, including the new Environmental and Social Framework (ESF).

For component 2, MEH disposes of an Environmental Unit which was created by the Ministry of Environment more than 10 years ago to ensure the appropriate consideration of environmental issues of energy projects. This unit will be in charge to ensure environmental and social compliance of activities under component 2. This unit will be supported by a consultant to conduct: (i) the screening of private companies with the screening form in Annex 12 of the ESMF; (ii) the review of Environmental and Social Charter for Private Resellers and Distributors of stand-alone solar systems and (iii) supervise Environmental and social Compliance and the implementation of ESH measures in the contracts of OGS involved in component 2. 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 mitigation measures and capacity building activities needed.

#### Safeguards Responsibilities Summary:

Component 1: Safeguards responsibility for Component 1 will lie with JIRAMA: (i) Subprojects will be subject to screening form in Annex 1 to ensure compliance with EMSF and compliance will be monitored by JIRAMA; (ii) Relevant E&S clauses will be included in the installation and civil works contracts with the contractors and compliance will be monitored by JIRAMA.

Component 2: Safeguards responsibility for Component 2 will lie with MEH:

#### Component 2a:

- (i) MEH, through its Environmental Unit, will hire a OMDF Fund Manager to manage the implementation of Component 2a, which will only support small rooftop solar PV systems that are expected to have negligible E&S impacts;
- (ii) The main tool for the management of E&S impacts will be a positive list (batteries and solar panels with long-life cycle) of supported product types and provisions on battery recycling and disposal to be complied with by the recipients of funds under the OMDF;
- (iii) These E&S provisions will be specified in ToRs, Fund Manager contract, and OMDF operations manual and compliance by the OMDF will be monitored by MEH (through the Independent Verification Agent: IVA);
- (iv) Working capital recipients will be required to comply with the project's E&S provisions (including compliance with the positive list and conditions regarding battery recycling and disposal) that will be specified in loan agreements between OMDF and recipients and compliance will be monitored by MEH and the OMDF (through the IVA);
- (v) RBF recipients will be required to comply with the project's E&S provisions (including compliance with the positive list and conditions regarding battery recycling and disposal) that will be specified in the grant agreements between OMDF and recipients and compliance will be monitored by MEH and the OMDF (through the IVA);
- (vi) MEH's oversight of E&S compliance of OMDF funding recipients will be supported by IVA (including compliance with the positive list and conditions regarding battery recycling and disposal).

#### Component 2b:

- (i) Health center electrification will only support rooftop solar PV installations that are expected to have small E&S impact and do not require any land acquisition or other resettlement-related impacts;
- (ii) Relevant E&S clauses will be included in the installation and O&M contracts with the contractors and compliance will be monitored by MEH.



With respect to the applicable safeguards policies and instruments, the project preparation process sought to identify and analyze the interests, concerns, and effects of project activities on major stakeholders and vice-versa. During project preparation, the GoM throughout JIRAMA with these Regional Departments concerned and its Consultant firm have conducted public consultations and meetings on the project in the regions. Extensive public consultations have been conducted during the preparation of safeguard instruments to take into account the local populations and communities preoccupations on the project design and impacts.

During implementation of the proposed project, the environmental and social safeguards instruments (RAP, ESMP,...etc.) will be prepared and built upon with the safeguard instruments prepared and approved during appraisal (ESMF, RPF) through a consultative and participatory process involving all stakeholders at the regional and national levels as well as within local communities and among beneficiaries of the subprojects. Project-affected groups and local non-governmental organizations will be consulted on all environmental and social aspects of the project and will take their views into account accordingly. Public consultations should be done as early as possible and provide all relevant material in a form and language(s) that are understandable and accessible to the groups being consulted in a timely manner prior to consultation. All the Safeguard instruments (RPF and ESMF) have been approved by the Bank and disclosed in-country and on the World Bank’s External Website.

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

With respect to the applicable safeguards policies and instruments, the project preparation process sought to identify and analyze the interests, concerns, and effects of project activities on major stakeholders and vice-versa. During project preparation, the GoM throughout JIRAMA with these Regional Departments concerned and its Consultant firm have conducted public consultations and meetings on the project in the regions. Extensive public consultations have been conducted during the preparation of safeguard instruments to take into account the local populations and communities preoccupations on the project design and impacts.

During implementation of the proposed project, the environmental and social safeguards instruments ( RAP, ESMP,...etc.) will be prepared and built upon with the safeguard instruments prepared and approved during appraisal (ESMF, RPF) through a consultative and participatory process involving all stakeholders at the regional and national levels as well as within local communities and among beneficiaries of the subprojects. Project-affected groups and local non-governmental organizations will be consulted on all environmental and social aspects of the project and will take their views into account accordingly. Public consultations should be done as early as possible and provide all relevant material in a form and language(s) that are understandable and accessible to the groups being consulted in a timely manner prior to consultation. All the Safeguard instruments (RPF and ESMF) have been approved by the Bank and disclosed in-country and on the World Bank’s External Website.

**B. Disclosure Requirements**

**Environmental Assessment/Audit/Management Plan/Other**

Date of receipt by the Bank  15-Oct-2018	Date of submission for disclosure  21-Nov-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**

Madagascar

08-Jan-2019

Comments

**Resettlement Action Plan/Framework/Policy Process**

Date of receipt by the Bank

15-Oct-2018

Date of submission for disclosure

21-Nov-2018

**"In country" Disclosure**

Madagascar

08-Jan-2019

Comments

**C. Compliance Monitoring Indicators at the Corporate Level (to be filled in when the ISDS is finalized by the project decision meeting)**

**OP/BP/GP 4.01 - Environment Assessment**

Does the project require a stand-alone EA (including EMP) report?

Yes

If yes, then did the Regional Environment Unit or Practice Manager (PM) review and approve the EA report?

Yes

Are the cost and the accountabilities for the EMP incorporated in the credit/loan?

Yes

**OP/BP 4.11 - Physical Cultural Resources**

Does the EA include adequate measures related to cultural property?

Yes

Does the credit/loan incorporate mechanisms to mitigate the potential adverse impacts on cultural property?

Yes

**OP/BP 4.12 - Involuntary Resettlement**

Has a resettlement plan/abbreviated plan/policy framework/process framework (as appropriate) been prepared?

Yes



If yes, then did the Regional unit responsible for safeguards or Practice Manager review the plan?

Yes

### **The World Bank Policy on Disclosure of Information**

Have relevant safeguard policies documents been sent to the World Bank for disclosure?

Yes

Have relevant documents been disclosed in-country in a public place in a form and language that are understandable and accessible to project-affected groups and local NGOs?

Yes

### **All Safeguard Policies**

Have satisfactory calendar, budget and clear institutional responsibilities been prepared for the implementation of measures related to safeguard policies?

Yes

Have costs related to safeguard policy measures been included in the project cost?

Yes

Does the Monitoring and Evaluation system of the project include the monitoring of safeguard impacts and measures related to safeguard policies?

Yes

Have satisfactory implementation arrangements been agreed with the borrower and the same been adequately reflected in the project legal documents?

Yes

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