

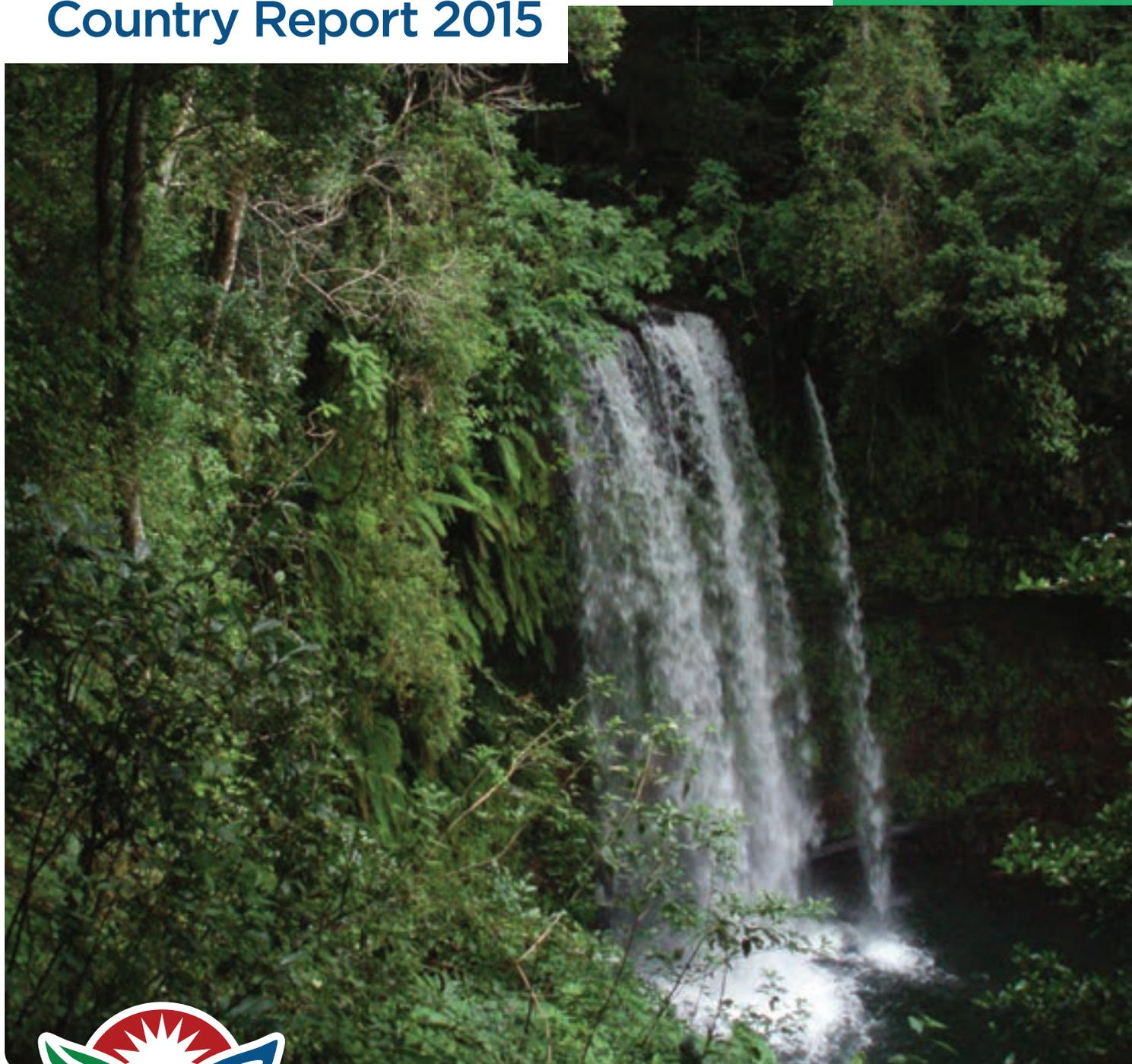


WAVES
Country Report
Madagascar
June 2015



Wealth Accounting and Valuation of Ecosystem Services (WAVES)

Madagascar Country Report 2015



WAVES

www.wavespartnership.org

Wealth Accounting and the
Valuation of Ecosystem Services

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Priority Policy Linkages And Workplan: An Update of Progress

June 2015

WAVES - Global Partnership for Wealth Accounting and Valuation of Ecosystem Services

Wealth Accounting and Valuation of Ecosystem Services (WAVES) is a global partnership led by the World Bank that aims to promote sustainable development by mainstreaming natural capital in development planning and national economic accounting systems, based on the System of Environmental-Economic Accounting (SEEA). The WAVES global partnership (www.wavespartnership.org) brings together a broad coalition of governments, UN agencies, nongovernment organizations and academics for this purpose. WAVES core implementing countries include developing countries—Botswana, Colombia, Costa Rica, Guatemala, Indonesia, Madagascar, the Philippines and Rwanda—all working to establish natural capital accounts. WAVES also partners with UN agencies—UNEP, UNDP, and the UN Statistical Commission—that are helping to implement natural capital accounting. WAVES is funded by a multi-donor trust fund and is overseen by a steering committee. WAVES donors include—Denmark, the European Commission, France, Germany, Japan, The Netherlands, Norway, Switzerland, and the United Kingdom.

Cover photo: Waterfall in Montagne d'Ambre National Park in northern Madagascar. This national park protects the watershed that supplies water to the nearby city of Antsiranana which has a population of over 100,000 people.

Contents

1.0	Introduction to WAVES Madagascar & Activities to Date -----	2
2.0	Overview of the political context in Madagascar -----	3
3.0	Overview of Macro-economic Context in Madagascar -----	3
4.0	Policy issues and priorities -----	5
4.1	Natural resource rent capture, distribution and reinvestment in the mining sector ---	6
4.2	Water resource management -----	7
4.3	Sustainable management of timber resources -----	8
4.4	Contribution of the tourism sector to the national economy -----	11
4.5	Macro-economic performance monitoring and natural resource management -----	11
5.0	Capacity building-----	12
6.0	Enhancing Sustainability of Outcomes-----	13
7.0	Implementation Arrangements -----	13
8.0	Summary Workplan-----	14
9.0	The Way Forward -----	16
10.0	Annexes: -----	17
	Annex 1: Madagascar M&E framework -----	17
	Annex 2: WAVES Madagascar: Detailed Workplan, Budget and Schedule-----	23

1| Introduction to WAVES Madagascar & Activities to Date

“WAVES Madagascar aims to strengthen the capacity to manage Madagascar’s natural capital and to promote sustainable development”

Almost half of Madagascar’s assets lie in its natural capital, which includes abundant crop and pasture land, water resources, mineral and non mineral subsoil assets, as well as the mega biodiversity and spectacular landscapes for which it is internationally renown. Natural resources also support the means of subsistence of a large majority of the country’s predominantly poor and rural population, and could become an importer driver of development. However, no robust quantitative analyses of the scale of the country’s total wealth exist and there are few policies to facilitate the transformation of economic benefits provided by natural capital in a way that could facilitate the country’s progress along a more sustainable development pathway.

WAVES Madagascar will establish a range of tools to integrate the economic value of selected natural resources into analysis and monitoring of macro-economic performance, as well as decisions and policy making related to natural resource management. Since the launch of WAVES Madagascar in 2011, the Government of Madagascar has signaled its strong support for the Partnership through Cabinet endorsement of Madagascar’s involvement, the allocation of co-financing of USD 500,000 for WAVES activities in and around protected areas, and the formal establishment of a national Steering Committee with high level technical representation from Government, including the Secretary-General of the Ministry of Economy and Industry that acts as the Co-president. In 2013, the Government has also endorsed a communiqué and declaration arising from the Summit on Sustainability held in Gaborone, Botswana related to the implementation of natural capital accounting

During the first two years of implementation of WAVES Madagascar, technical activities focused on consultations and awareness-raising with Government, civil society and development partners to introduce concepts of natural capital accounting and to undertake a scoping exercise. As a result of these discussions, the following priority issues were selected for consideration during WAVES activities: (i) rent capture, distribution and reinvestment in the mining sector; (ii) integrated water resource management planning; (iii) sustainable management of timber resources; (iv) contribution of the tourism sector to the economy; (v) sustainable financing of the national protected area network; (vi) natural capital accounting for fisheries and coastal resource and (vii) macro-economic performance monitoring. These discussions led to the development of a detailed workplan and budget for WAVES Madagascar, which was approved by the Steering Committee in August 2012.

In 2013, Government recruited a WAVES National Coordinator, who plays a central role in the workplan implementation. Technical working groups were established for each identified priority issue. With support from international technical assistance, these working groups identified clear and tangible links between desired policy outcomes and natural capital accounts. Based on these targeted outcomes, a series of sector specific roadmaps were elaborated to guide technical and policy activities over the next several years. During the course of implementation, the technical working groups have been strongly involved in data collection and assessment of information gaps. They have also been the recipients, alongside with the national statistics agency—INSTAT, of capacity building activities.

The structure of the accounts has been devised to ensure they are aligned with the identified policy issues for each sector and the needs expressed by decision-makers. In each sector, two parallel processes of account elaboration are being implemented simultaneously: one for which

data is readily available, and one which requires further methodological and conceptual work, and for which data is less accessible. Data collection is currently underway for all priority accounts.

2| Overview of the political context in Madagascar

Madagascar's development has been hindered by repeated political crises, occurring every decade on average since the country's independence in 1960. The latest crisis followed the unconstitutional change of regime in 2009, and lasted close to five years. It left the economy severely crippled and led to a sharp rise in poverty levels. In 2012, income per capita had fallen to its 2003 level (around USD 400). Madagascar emerged from the crisis with the election of Hery Rajaonarimampianina as head of state in December 2013. A first Government was nominated in March 2014 under the direction of the Prime Minister Kolo Roger. He was replaced in January 2015 by General Jean Ravelonarivo, who proceeded to reshuffle Government. While the Minister of Economy, Minister of Water and Minister of Tourism were retained, the Ministry of Mines will adopt a new organization chart and the Minister of Environment was replaced. Changes in organization chart and at the Minister level also generally results in the nomination of a new Secretary General and Director Generals. These changes have a destabilizing effect, with repercussions on the implementation of the WAVES work plan and the availability of key decision makers. With the return to normality, it is expected that the speed of implementation will quickly pick up. The General state policy (*Politique Générale de l'Etat*) was presented towards the end of 2014. It is now being translated into precise action plans for each sector. Natural Capital Accounting has featured prominently in the General state policy.

3| Overview of Macro-economic Context in Madagascar

For the last thirty years, weak growth and fragility in the face of repeated political crises have characterized the macroeconomic performance of Madagascar. Between 1980 and 1995, average annual GDP growth was less than 2 percent. Improved GDP growth rates were evidenced from the late 1990s, and significant growth was seen between 2004 and 2008, with a peak in annual growth of 7.1 percent in 2008. With the onset of the political crisis in 2009, it dropped dramatically to negative growth of -4.6%, before returning to positive growth of 1.6 percent in 2011. Macroeconomic conditions remained generally stable at end-2014. The growth rate is estimated at 3 percent, driven by extractive industry and services sector. Current expenditures continue to absorb a significant share of total spending (75 percent). Capital expenditures have been oriented towards the social sectors (education and health), agriculture and public works. Public resources have been supported by the recent return of external financing.

The modest economic growth experienced by Madagascar in recent decades has been insufficient to compensate for the country's rapid population growth, currently estimated at 2.8 percent per annum. With GDP/capita estimated at US\$453 in 2010, Madagascar is categorized amongst the poorest countries in the world. Since 1980, GDP/capita has decreased in real terms and an 18 percent decrease in real GDP/capita was evidenced between 2008 and 2010. The gap in terms of GDP/capita between Madagascar and the Sub-Saharan African region has widened over this period, with current national GDP/capita less than half the regional average. 76.5 percent of the population—representing 15.4 million persons—lives below the poverty line. Rural areas experience the highest levels of poverty with 82.2 percent compared to 54.2 percent in urban areas

The tertiary sector is the predominant sector in the Malagasy economy representing 53 percent of GDP in 2010. Transport and service activities dominate the GDP of the tertiary sector and while tourism continues to play an important role, economic activity in this sector, which has traditionally been one of the largest sources of foreign exchange earnings, has been significantly affected by the current political instability.

The primary sector accounts for 25.7 percent of the national GDP, with agricultural activity the most important contributor, followed by livestock and fisheries and forestry activities. Agriculture is the main livelihood source for the rural population and is essential to meet subsistence needs. Agricultural production—notably rice production—is in fact the single largest contributor to GDP constituting 14.1 percent of GDP in 2010. The contribution of coastal and marine resource exploitation has stagnated in recent years with economic activity decreasing annually by 2 percent between 2008 and 2010. The contribution of forestry to GDP has seen a net augmentation in the same period with annual growth of 30.4 percent linked to precious timber exploitation that had an export value of US\$176 million in 2009.

Industrial economic activities are dominated by food, beverage and energy production however the mining sector is of growing importance, in light of two recent large-scale mining operations: Rio Tinto's ilmenite mining operation in the South-East, and Ambatovy's nickel and cobalt mining operation in the East. According to the findings of a recent World Bank study, industrial mining could account between 4 and 14 percent of GDP and dominate Madagascar's exports by 2025. It should provide up to 10 percent of the country's fiscal income.

The national economy is not greatly diversified and is concentrated in several sectors and geographic regions that have become development hubs because of their higher population densities, their proximity to large development projects (such as mining projects) or their access to markets. The marginalization of other regions where poverty rates are significantly higher has influenced the poor economic performance of the entire country. This inequality of economic activity, particularly in rural areas, has led to a lack of employment opportunities for poor rural households, thus increasing their overall vulnerability.

Madagascar has an open economy and has favored regional economic integration, however exports to neighboring countries remain low and Europe, the USA and Asia have to date remained the most important markets for Madagascar. In the last three years, the suspension of preferential trading treaties following the onset of the political crisis has however negatively affected export activities to these countries.

Weak national savings and high fiscal pressure (estimated at 11 percent of GDP in 2010) are limiting factors to development of the private sector and investments in human capital. The economy remains highly dependent on external aid, which before the 2009 political crisis accounted for approximately two thirds of the public investment budget, and foreign direct

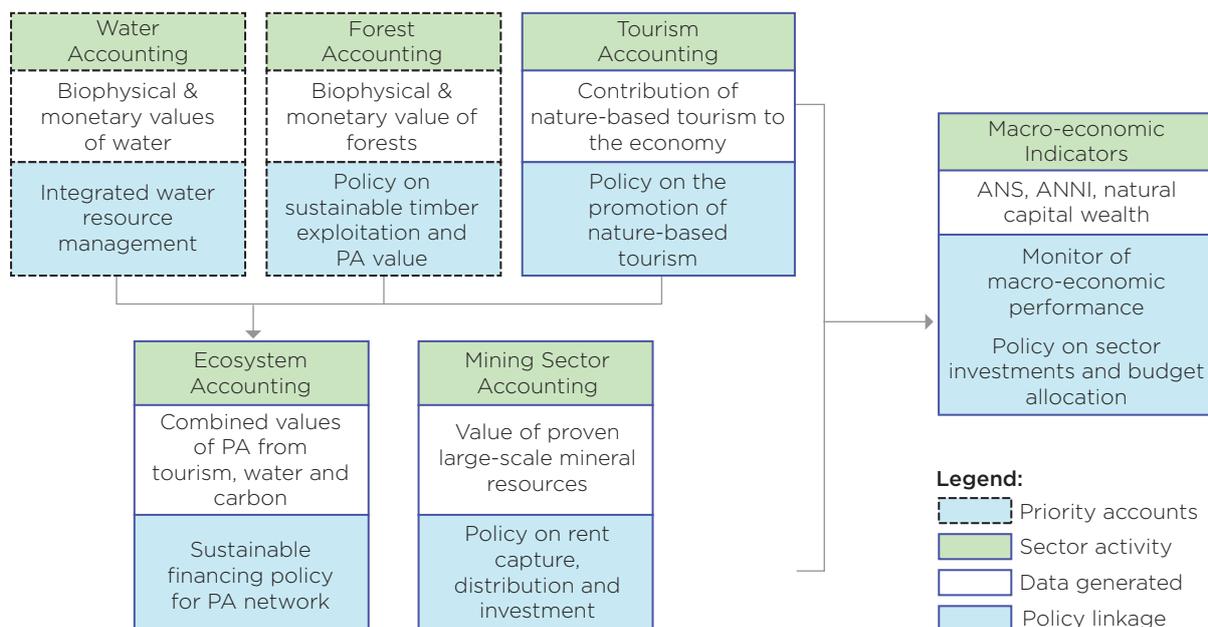
investment in a limited number of sectors such as mining and to a lesser extent tourism. Following the onset of the political crisis, suspension of foreign aid has severely affected public investments with a decrease of 60 percent between 2008 and 2009.

The national economy is vulnerable in the face of climatic shocks such as droughts, cyclones and flooding that affect the country every year. These events provoke considerable damages in key economic sectors such as the transport and agricultural sectors and the effects are unequally distributed with poor, rural populations being the hardest hit. The 2008 cyclone season, which was the last season for which a comprehensive evaluation was carried out, caused losses equivalent to 4 percent of GDP and the 2012 season is expected to cause similar levels of losses. Other exogenous factors, including the volatility of prices of key imports and exports on global markets (e.g. vanilla, shrimp, rice and petrol) have also affected recent economic performance.

4| Policy issues and priorities

The starting point for the development of the WAVES Madagascar workplan was the identification of a series of priority policy questions across several key sectors that could be informed by natural capital accounting activities. During the preparation phase to the implementation of WAVES, seven broad policy issues were identified as entry points for WAVES activities: (i) integrated water resource management; (ii) sustainable timber exploitation; (iii) promotion of nature-based tourism; (iv) sustainable financing of the protected area network; (v) mining rent capture, distribution and investment; (vi) integrated coastal resource management plan; and (vii) sector investments and budget allocation. During the course of implementation of the WAVES program, these policy linkages were further investigated, discussed, and refined according to new priorities. Discussions revolved in particular around the need to reduce the number of accounts under preparation, in light of the resource-intensive nature of data collection to construct each of the accounts, and difficulties met in certain sectors.

 **Figure 1. Madagascar Outputs and Policy Linkages**



For example, discussion on mineral resource rent capture is extremely sensitive, and the collection of data on existing stocks, revenues and exploitation costs have been slow and painstaking. Conversely, water and forest accounts have been making strong progress, and have generated strong interest from the Ministries. They have been identified as such as priority accounts, on which the WAVES program should focus to begin producing results, thus helping various stakeholders to improve their understanding of the potential impact of natural capital account on decision-making. It has been decided at this stage to drop the fisheries account from the WAVES program. In addition, based on the data collected from the water, forest and tourism accounts, an ecosystem account could be constructed for a selected protected area. This will be further discussed and decided upon at a later stage.

4.1| Natural resource rent capture, distribution and reinvestment in the mining sector

Madagascar is recognized as a geologically rich country, with extensive mineral and non-mineral sub-soil assets that have the potential to generate large economic gains over a relatively short period of time. With the recent development of the first two large-scale mining operations in Madagascar, the formal mining sector's contribution to GDP is expected to grow from less than 1 percent to 15 percent in coming years. Numerous other large-scale mining operations are in the exploration phase throughout the country and Madagascar is considered to be on the cusp of a major increase in large-scale mining activities.

Despite the potential economic benefits that exist, royalties captured by the State from existing large-scale operations are relatively low (between 1 and 2 percent) compared to other countries. Furthermore, despite Madagascar's position as a pioneer in terms of revenue distribution to regional and local communities, conflicts prevail in terms of the proportion of revenues earmarked for different levels of the administration and the mechanisms used for revenue sharing.

Many private sector operators have expressed their willingness to participate in dialogue on these issues through their implication in the Extractive Industries Transparency Initiative (EITI) process, of which Madagascar is in the process of becoming a full member. However, operators have also expressed frustration at the weak policy framework and inconsistent political decisions that have resulted in the suspension of exploration and development activities in the last few years. Given the growing awareness on the part of communities and civil society regarding the potential economic benefits of mining activities, and the growing interest of international companies in Madagascar's mineral resources, these issues are expected to remain at the forefront of the political debate in coming years.

The transformation of the country's non-renewable mineral natural capital to other productive forms of capital, will require a strong and consensual policy framework with identified policy needs in four areas: (i) policies to promote efficient resource extraction in order to maximize resource rent generated by the extractive sector; (ii) a system of taxes and royalties that allows Governments to recover equitable and proportionate shares of rents; (iii) a clear policy for the investment of resource rents in productive assets; and (iv) policies to manage land use conflicts and control adverse effects of resource extraction on other components of natural capital.

As a first step, WAVES Madagascar will provide technical assistance in developing industrial mineral physical and monetary stock accounts. These will help inform Government of the country's existing mineral resources, which are currently being exploited, and estimate current and possible future rents generated from such resources. This will be used to help inform mining fiscal policy. The mining accounts can also be complemented by information on ecosystems and

other economic sectors such as agriculture to guide policy on the trade off between conservation and mining development.

The mining technical working group has developed physical stock accounts for cobalt, nickel, chrome and ilmenite. The working group is working with the support of an international technical assistant to eliminate inconsistencies in the data. In parallel, the working group has prepared a methodological note on the calculation of the resource rent for these four mineral substances, based on which the monetary stock accounts will be developed.

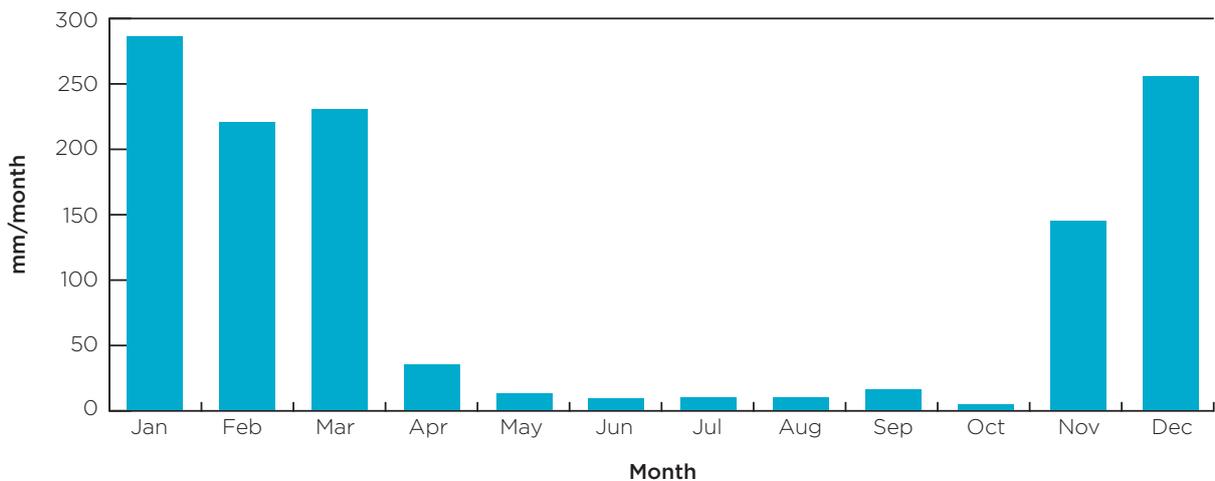
4.2| Water resource management

Madagascar is a country with abundant water resources. It receives in average more than 1.500 mm of rainfall annually. Total renewable water resources per capita (annual surface runoff plus groundwater infiltration) are almost 15.000 cubic meters, almost four times the value of the indicator in France. Yet the water exploitation index¹ is less than 5 percent, compared with 26 percent in neighboring Mauritius or 65 percent in Morocco.

However these annual-country-wide averages hide seasonal and subnational differences. More than 90 percent of annual precipitation occurs during the November to April period (see graph below), and the precipitation from May to October is less than 150 mm/year, drier than Morocco.

In addition, there are marked regional differences in rainfall, affecting water availability. The east and north of the country typically have abundant rainfall, while the west and south are drier and experience recurrent water stress. National level data therefore mask important disparities at the basin and even sub-basin level. Since precipitation between April and October is very low, it is necessary for Madagascar to develop storage capacity in order to transfer the water collected during the rainy months to the dry months. Existing storage capacity is estimated at less than 500 million cubic meters, which represents less than 3 percent of the amount of water abstracted for irrigation. It is important to assess the natural capacity of storage of lakes, and aquifers, and how they can be used for water management.

 **Figure 2.** Average monthly precipitation estimates



¹ The proportion of total water resources abstracted (MDG indicator 7.5).

The agricultural sector has the highest water use (estimated at 96 percent in 2000), followed by municipal use (3 percent) and industrial use predominantly for the textile, hydroelectricity generation and mining industries (2 percent). The irrigated agricultural surface in Madagascar, predominantly for rice growing, is estimated at 1 million hectares or 30 percent of the total of cultivated land. In 2010, 45 percent of households had access to a secure water supply; although the rate was significantly higher in urban areas than in rural areas. The growing large-scale mining sector will have significant water needs and availability of adequate secure resources will be essential to the development of this industry. Initial studies carried out by the World Bank and others indicate that the biophysical hydroelectric potential of the country's water resources is under-exploited and could be significantly increased. Currently hydroelectricity accounts for only two thirds of the national electricity production despite its potential economic advantages over thermal power production and efficiency of existing hydroelectric power stations is increasingly affected by sedimentation of dams.

The preliminary analysis of information described above provided a basis for setting the priorities in data collection and compilation for water stock and flow accounts for all major river basins. They will help define the quantity of water resources which are renewed annually through precipitation and how these have changed over time, so as to identify trends in the long term availability of renewable water in Madagascar. All the necessary data has been collected to elaborate the physical stock account for the 2001–2013 period, including renewable water stocks for the country's 530 sub-basins. These are currently being aggregated geographically at level of the 530 sub-basins, 31 basins, as well as on a yearly basis. Discussions are being held within the Ministry on the adequate basin delimitations, since these differ from one institution to another. It is expected that the water physical stock accounts will be finalized in the coming months. In parallel, the technical working group is collecting data on water use from relevant ministries and institutions, including the Jirama (the electricity and water management agency) and the Ministry of Agriculture. This data will be used to construct the water flow accounts. Data will be added progressively on: (i) extractive, manufacturing and construction industries, (ii) electricity, gas, steam and air conditioning production; (iii) waste water collection and treatment, water distribution; (iv) sanitation; (v) waste collection and treatment, services; and (vi) domestic use.

4.3| Sustainable management of timber resources

In Madagascar, more than 95 percent of the population relies on timber for fuelwood, charcoal and construction purposes. Energy needs create significant pressures on forests, and are thought to amount to 80 percent of yearly domestic wood consumption. It is estimated that over the last two decades, 57km² forest area has been converted into different land uses annually on average. Patterns of consumption vary geographically, with more than double the annual average consumption of timber per person in urban areas, compared with rural households. With the current 2.8 percent demographic growth, Madagascar's population is expected to double by 2040, thus leading to a significant rise in anthropogenic pressures on natural resources.

Demand in fuelwood is expected to start outstripping supply in the next 10 to 15 years, and if no alternative is proposed, populations will increasingly target protected areas. The need to ensure timber exploitation is sustainable has been seen as an entry point for the WAVES program. WAVES Madagascar would help improve understanding on the quantities and patterns of use of timber for energy consumption, and the required policy to ensure demand is met adequately. It could also help inform a policy on the use of improved cookstoves.

WAVES Madagascar will develop physical and monetary forest stock accounts for the whole of Madagascar. The forestry technical working group has gathered significant relevant data, including mapping of deforestation in 1990, 2000, 2005 and 2010 carried out by Conservation International and the National Environment Agency (ONE), the 1996 national forest inventory, and ad hoc inventories carried out from 2001 onwards in selected areas. A firm has been recruited to compile all data and complete the modeling using satellite images. The objective of the study was to provide data on the volume and surface areas of timber resources for the 2005, 2010 and 2013 time periods for protected and non protected areas, and each forest type. Land cover is classified according to: (i) dense dry forests; (ii) dense humid forests; (iii) spiny forest; (iv) mangrove; (v) woodland; and (vi) tapia; (vii) pine plantation; (viii) eucalyptus plantation; (ix) other plantation; (x) other vegetation; (xi) open land; and (xii) water body. Figure 3 below shows the proportions of various types of forest cover and land use (FCLU).

Results show that dense humid forests occupy in 2013 the largest natural forest surface area in Madagascar (4.8 million hectares, 8.2 percent of FCLU), followed by spiny forests (2 million hectares), dense dry forest (1.9 million hectares) and mangroves (180.000 hectares). In absolute terms, dense humid forests have suffered the biggest loss of surface area, estimated at approximately 1.6 million hectares between 2005 and 2013: almost a quarter of the surface (see map below). As a proportion of the whole, the western dense dry forests have suffered the greatest loss in loss areas, estimated at a little over 40 percent between 2005 and 2013 (a little over 1.4 million hectares). Spiny forests and mangrove surface areas have decreased by 11 percent (270.000 ha) and 13 percent (26.000 ha) respectively over the same period. Data has been disaggregated per region as well as protected and non-protected areas.

Timber volume varies according to the forest type and geographic location (see map below). Preliminary results indicate that total timber volume has decreased between 2005 and 2013 for dense dry and dense humid forests, by 26 and 54 percent respectively (to reach 340 million m³ of dense dry forest and close to 1.5 billion m³ of dense humid forest). Conversely, spiny forests have increased in volume from 115 million m³. This data will be further disaggregated at protected and non-protected levels.

Figure 3. Proportions of forest cover and land use types, 2013

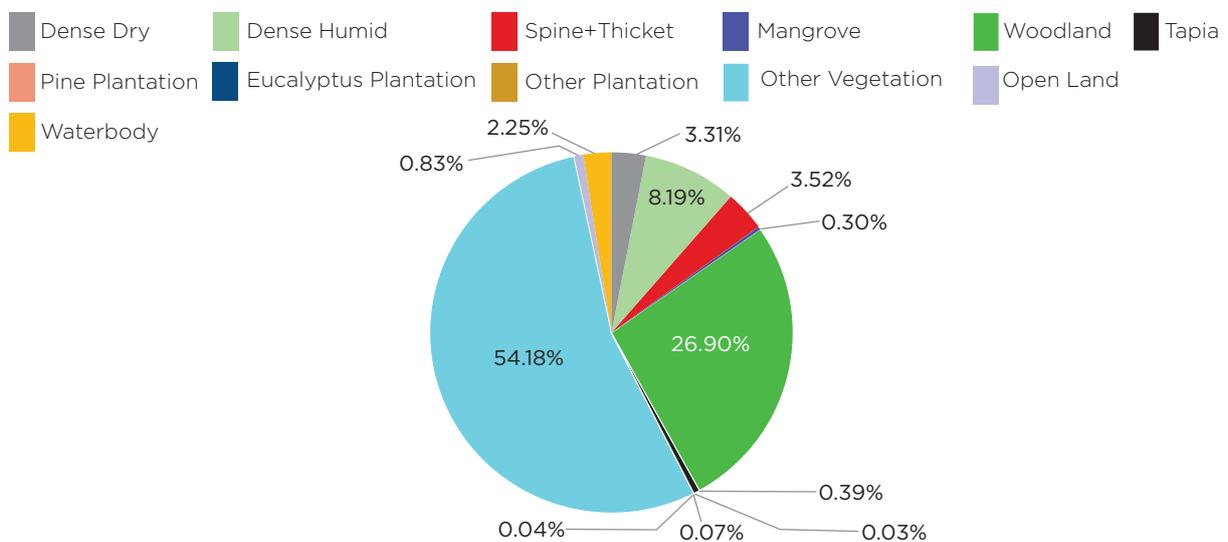
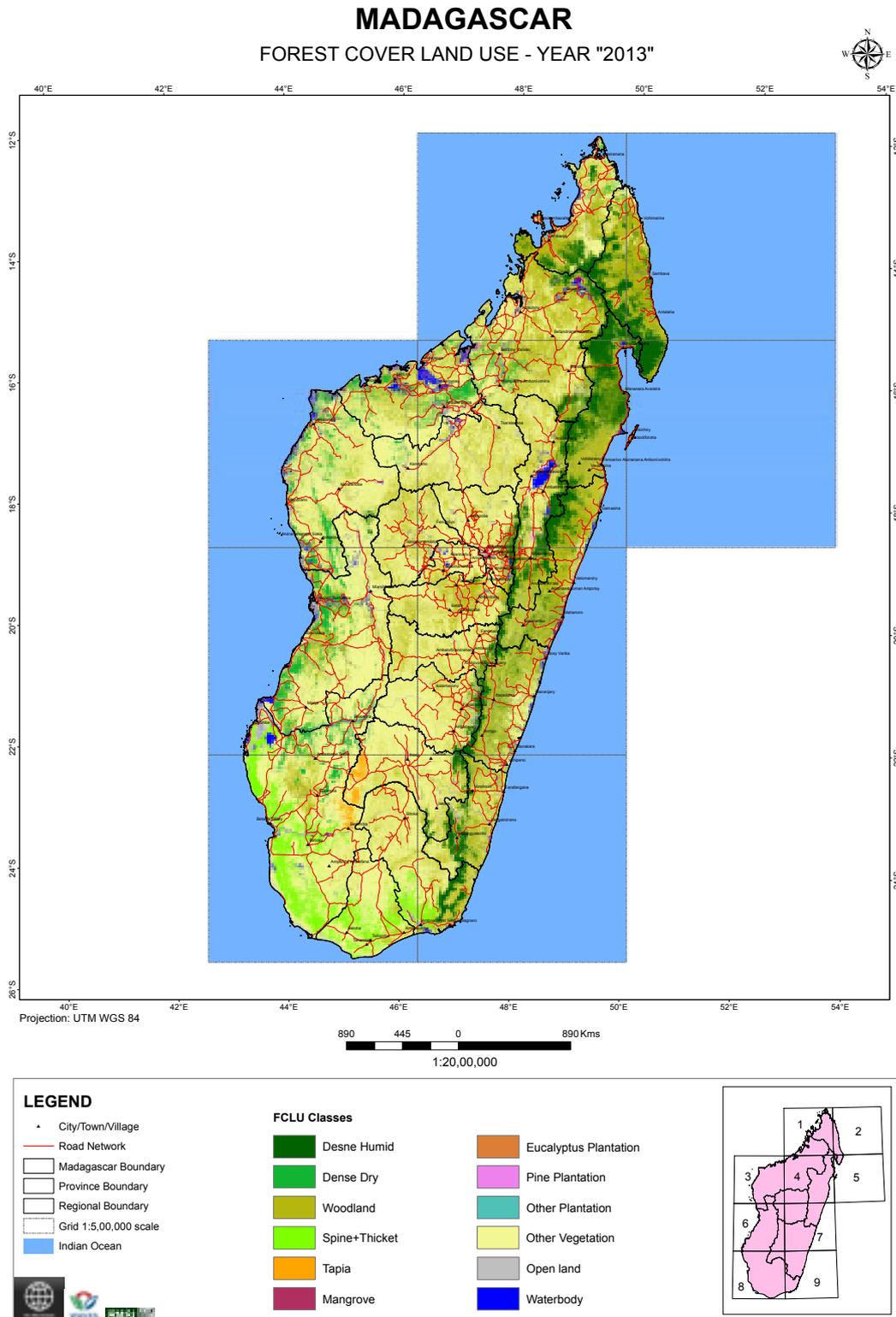


Figure 4. Timber volume, m³/ha, 2013



The technical working group is currently defining the methodology to estimate the quantities of illicit timber stocks. Data is being collected at the regional level on the exploitation permits, associated quantities and use. Furthermore, a preliminary methodology has been designed to assess the monetary value of standing trees. A firm will be recruited to complete the methodology, carry out the data collection and support the technical working group in elaborating the monetary stock account. A policy brief will be prepared based on these preliminary accounts.

4.4| Contribution of the tourism sector to the national economy

With spectacular landscapes, terrestrial and marine ecosystems, and world renown fauna and flora, there is strong potential Madagascar's nature-based tourism sector. According to a 2009 study, 70 percent of tourists traveling to Madagascar visited at least one protected area, and that figure increased for trips organised by tourism operators. Pre-crisis, the tourism industry was valued at USD 500 million per year, with an average 10 percent annual growth rate. Tourism is not only an important source of foreign exchange earnings, accounting for over 6 percent of GDP in 2007, but also provides more than 200,000 jobs (5 percent total employment), in particular in remote rural areas, targeting the most vulnerable segments of the population. Despite this growth, the Madagascar tourism industry remains small, with only 200,000 tourists in 2012, compared with almost 1 million in neighbouring Mauritius.

Despite Madagascar's unique biodiversity and landscapes being the main draw card in attracting tourists, current capture of the economic benefits of tourism harbored within the network of protected areas is very low—only US\$1 million/year is generated by tourism through park entry fees. It has however been estimated that ecotourism alone could generate US\$28 million per year², and such revenues could be used both to improve the protected area's financial sustainability and for the natural resources sector more generally. This issue has been selected as an entry point for the establishment of a partial tourism account in Madagascar. This partial account will be focused on the current and potential financial benefits of tourism in protected areas.

To this end, a visitor and enterprise tourism survey was conducted between September and November 2014, to generate information on the size and economic contribution of protected area tourism to national economic development. Based on the technical assistance provided by an expert, it was decided that full tourism satellite accounts (TSA) would be developed, rather than a partial, protected-area focused TSA, to ensure accuracy of information by balancing out each account component. The TSA will provide information on: (i) tourism's contribution to GDP; (ii) employment in tourism; and (iii) tourist expenditure and consumption data. This data will be further disaggregated among visitors that visited a protected area, and those that didn't, to provide information on the contribution of nature-based tourism. While it was initially decided to pursue the survey for the remaining nine months of the year, it has been decided that technical assistance will be sought to help extrapolate the data collected over the three-month period to build the first TSA.

4.5| Macro-economic performance monitoring and natural resource management

Madagascar's system of national accounts and macro-economic indicators make scant reference to natural capital values. While data on volume and value of production is available for

² In USD (2003) and based on a network size of 6.9 million hectares, sourced from Carret & Loyer. 2003. Comment financer durablement les aires protégées à Madagascar? Agence Française de Développement, Paris.

certain sub-sectors (e.g. large scale mining, large-scale forestry, large-scale and small-scale fisheries and agriculture), data on potentially important small-scale and informal activities in the mining, forestry and fisheries sectors is missing, and there is little information on royalties, fees and taxes for natural-resource based sectors.

Progressive inclusion of natural capital values in the system of national accounts for priority natural resource issues, and development of macro-economic indicators will thus improve the country's ability to: (i) monitor the sustainability of its economic development; and (ii) manage key natural resource based sectors. For the purposes of WAVES Madagascar activities, the focus will be on developing new, complementary macro-economic indicators including adjusted net savings (ANS) and natural capital wealth.

A workshop will be organized to build capacity in the estimation of ANS and natural capital wealth, and to ensure a common understanding is shared between the various institutions on the definition of these indicators, but also the methodology to calculate their value. Participants will include the president of the WAVES steering committee, the WAVES coordinator, the Director General of Planning and members of the natural capital integration service within the Ministry of Economy, the National institution of statistics, and the World Bank. At the end of the workshop, a work plan will be established and responsibilities shared for collecting data and updating the indicators.

The technical working group also prepared a macro-economic policy note, which sheds some light on the conceptual basis of natural capital accounting in the integrated management of Madagascar's assets, description of the macro-economic indicators. The policy note will be updated once the indicators have been developed, and it will be used to inform decision-makers.

In the medium to long term, the outcomes of natural resource accounting activities supported by WAVES Madagascar will be progressively included to further refine the indicators. Technical activities will be complemented by capacity building both in the development and maintenance of these indicators, as well as in their use and interpretation.

5| Capacity building

Capacity building is a key component of the workplan, aiming to institutionalize natural capital accounting beyond the implementation of the WAVES project. The focus is on “hands-on” training for national counterparts in Government, research institutes and civil society in the development and use of natural capital accounts.

The WAVES technical working groups have benefitted from several capacity building workshops provided by international experts, as well as the firms recruited to carry out data collection. Over the last year, such workshops have included the following topics: (i) methodology to construct mineral stock accounts and calculate mining resource rent; (ii) data collection for water physical stock and flow accounts; (iii) forest land use and timber volume calculation and mapping; and (iv) macroeconomic indicators for natural capital accounting. Beneficiaries have included members of the relevant technical working groups, including representatives from the Ministry of Economy, Environment, Mines, Water, Agriculture, as well as the Institute of Statistics and other parastatal agencies.

In addition, two representatives of the Ministry of Economy took part in a week-long workshop in the Philippines on ecosystem accounting, organized by the Government of the Philippines and

the WAVES Secretariat. The main take-away points for the Malagasy delegation were the following: (i) Simplify: reduce the number of accounts, and focus on getting results on priority accounts first, for which there is also sufficient data, to show decision-makers the use of NCA, get more buy-in for future accounts; (ii) take NCA one step at a time, collect as much data as possible and start building with available data, improve the accounts progressively, no country has perfect data to start with; (iii) land accounts are generally the first step to building ecosystem accounts. They are useful in that they provide a big picture of the existing issues and possible conflicting policies, and can quickly illustrate the use of NCA to decision-makers. Madagascar also possesses a lot of data on land cover and use, and this could possibly be compiled fairly quickly; (iv) choose one pilot area to build water accounts, then ecosystem accounts. Eg. The Lac Aloatra catchment area, which provides irrigation for one of Madagascar's major agricultural zones, and for which productivity has been decreasing. Water accounts could then be expanded to other regions (e.g. Betsiboka watershed, feeding the Marovoay agricultural zone); (v) priority accounts for Madagascar would be: Water, forests, and possibly land accounts depending on available data and budget.

6| Enhancing Sustainability of Outcomes

Capacity building has commenced in 2013, when the national statistics agency, INSTAT and technical working groups received training on the structure of accounts and methods to assess the monetary value of natural capital in different sector. P4GES also gave a training on the use of the Water World tool in 2014, to which members of the Water technical working group were conveyed. Each study to be carried out by consultant includes a capacity building component to ensure results are well understood and appropriated, and the work can be replicated in the future.

Discussions with the new Government in place on institutional arrangements for natural capital accounting will continue throughout workplan implementation. Issues that will be discussed will include the institutional home of satellite accounts, the roles and responsibilities of various agencies including the national statistics institute and line ministries, as well as the policy or legislative mechanisms that may be appropriate to ensure ongoing compilation and use of satellite accounts.

7| Implementation Arrangements

A key objective of WAVES Madagascar is to optimize the sustainability of the mechanisms and tools that are established for natural capital accounting in terms of institutional structure. Implementation arrangements for WAVES Madagascar are described below.

The *WAVES Madagascar National Steering Committee*, in partnership with the WAVES Global Partnership Secretariat, is responsible for overseeing implementation of activities in Madagascar. This Steering Committee is presided by the Secretary-General of the Ministry of Economy and Industry and Conservation International. The Steering Committee also includes representatives from sector line ministries (i.e. water, environment, mines, forests and economy) and the private sector (Chamber of Mines, tourism organizations and enterprise bodies).

A series of *Technical Working Groups* have been established by the Steering Committee to provide technical guidance and support to activities in different thematic work areas. To date Technical Working Groups for the macro-economic performance monitoring, mining, water resources and forestry sector have been established. They include high level representatives and technicians of the relevant Ministries, as well as members of local civil society. These technical working groups meet on a regular basis and actively participate in discussions on policy issues, conceptualizing studies and overseeing data collection.

The World Bank-led *WAVES Global Partnership Secretariat* coordinates global activities and provides technical advice and support to the Steering Committee and the World Bank in-country technical assistance team. The Secretariat provides the link to the WAVES Policy and Experts Technical Committee that is leading the methodological development activities of WAVES at the global level.

The *WAVES National Coordinator* has been recruited to act as the Government focal point and liaison for WAVES Madagascar. The National Coordinator provides secretariat and support services to the Steering Committee and the Technical Working Groups, and liaises closely with the World Bank technical assistance team in the day-to-day management of WAVES activities.

The *World Bank Technical Assistance team* is based in Madagascar and provides day to day project management support and technical assistance to the Steering Committee and the National Coordinator. This team acts as a key technical liaison with the Global Partnership Secretariat and other WAVES partner countries.

Discussions are ongoing with the Government to optimize the institutional structure for the implementation of NCA. In 2014, a *Natural capital accounting service* was established within the Ministry of Economy, and staffed with a 5-person team. Eventually this service will take on the role and attributions of the national WAVES coordinator, who is currently recruited under the WAVES trust fund. The WAVES coordinator has devised a capacity transfer program to progressively allow the service to coordinate NCA activities. In addition, it was decided that a champion should be designated within every relevant ministry for each account under preparation. This champion would be responsible for the implementation of the work plan, including data collection and account development, with support from the coordinator, technical assistant and the World Bank. Champions are selected based on their understanding of natural capital accounting, their level of engagement and commitment to the WAVES program. A champion has already been identified for macroeconomic indicators, as well as water and forest accounts.

8| Summary Workplan

The WAVES Madagascar workplan was structured around seven technical work areas that correspond to the policy linkages identified in the previous section 4. The estimated total budget of WAVES Madagascar is USD 2.0 million, of which USD 1.5 million would be allocated from the WAVES multi-donor trust fund, and USD 0.5 million is co-financing allocated by the Government of Madagascar through the Third Environment Program Additional Financing Project (EP3 AF). Annual reviews of the workplan have been carried out to review progress against workplan objectives, and allow preparation of detailed annual activity schedules and budgets.

Table 1. WAVES Madagascar Summary Workplan (revised)

Work Area	Objective	Expected Overall Outcomes	Indicative Budget (USD)
1. Macro-economic indicators	To develop new macro-economic indicators that integrate economic values of natural resources, and that are complementary to existing indicators, are developed to guide and facilitate monitoring of sustainable development.	Macro-economic indicator development and annual revision including adjusted net savings (ANS), adjusted net national income (ANNI) and natural capital wealth	35,000
2. Mining sector	Contribute to medium to long-term policy dialogue on rent recovery, distribution and investment	Satellite account development for proven resources in large-scale mining sector and policy analysis. Satellite account for small scale mining if feasible.	34,000
3. Managing watersheds and water resources	Contribute to regional integrated water resources management planning	Monetary and physical accounts for water resources, and policy analysis related to integrated water resources management	290,000
4. Sustainable timber sector exploitation	Contribute to the development of a policy on sustainable timber exploitation	Biophysical and monetary value of exploitable timber. Policy analysis related to sustainable timber exploitation.	500,000
5. Contribution of the tourism sector to the economy	Contribute to a policy on promotion of nature-based tourism that supports economic development and poverty reduction	Tourism satellite accounts, providing data on: (i) Tourism's contribution to GDP; (ii) employment in tourism; (iii) size and characteristics of tourism; and (iv) tourist expenditure and consumption data. Disaggregation to understand	433,000
6. Pilot ecosystem accounts	Contribute to sustainable financing of the national protected area network	Analysis of combined ecosystem service values—ecotourism, water resources, carbon and non-timber forestry values—in selected protected areas to feed into sustainable financing policy for the PA network	78,000
7. Capacity building	National counterparts are empowered to undertake natural capital accounting tools and use the results in policy development	Trained national counterparts in Government, research institutes and civil society	240,000
8. Project management	WAVES activities are managed in partnership between the World Bank and Government	A core team of World Bank and Government staff are resourced to manage and support WAVES activities	390,000

In light of the identified need to simplify (see discussion above), it has been decided that the fisheries account would be dropped. In addition, the Steering Committee will assess the feasibility of developing land accounts and a pilot ecosystem account. Water and forest accounts have been identified as priority accounts in light of sector interest in building the accounts and availability of data.

9| The Way Forward

In light of the significant inclusion of natural capital accounting in the State general policy and the continuous commitment within the Ministry of Economy in the form of the establishment of a Natural capital service, the next year will see further substantive progress in the implementation of the WAVES Madagascar workplan. Preliminary accounts will be available in the mining, forestry and water resources sectors. The first round of estimates of complementary macro-economic indicators—ANS, and natural capital wealth is also expected in the coming year. These accounts will be accompanied by policy analysis and an appropriate communication and outreach strategy. This will help to ensure that NCA is recognized as an important tool for resource management across key ministries and agencies.

10| Annexes:

Annex 1. Madagascar M&E framework

Objectives & Outcome (Results) Indicators	Base-Line June 2011	Prep year June 2012	Yr 1 Jun-13	Yr 2 Jun-14	Yr 3 Jun-15	Yr4 Jun-16	Yr5 Jun-17 (proposed)
PDO 1. To implement natural capital accounting in partner developing and developed countries							
Outcome Indicators:							
a. Country has committed to institutionalize natural capital accounting based on lessons learned from the WAVES program	No commitment				Directorate for NCA created within the Ministry of Economy. The directorate has been established and staffed with 5 people. Capacity building and transfer of knowledge are being carried out by the WAVES coordinator.		
Intermediate Outcomes Indicators							
1.1 Country has completed the milestones for the WAVES Preparation Phase ^a	None	All completed					

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Annex 1. Madagascar M&E framework (continued)

Objectives & Outcome (Results) Indicators	Base-Line June 2011	Prep year June 2012	Yr 1 Jun-13	Yr 2 Jun-14	Yr 3 Jun-15	Yr 4 Jun-16	Yr 5 Jun-17 (proposed)
1.2 Country has asset accounts for selected natural assets	No accounts				Completion of national water stock account by river basin; The stock account are being developed and should be completed within the target. Subsoil assets for large mines; These should be completed for the 4 main industrial minerals. Forest accounts for Non-Protected Areas only. Preliminary accounts should be available within the given time frame.	Mineral accts for small scale mines. It is uncertain at this stage whether sufficient data will be available by the end of Yr4 to construct the accounts. Refine accounts	Refine accounts

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Annex 1. Madagascar M&E framework (continued)

Objectives & Outcome (Results) Indicators	Base-Line June 2011	Prep year June 2012	Yr 1 Jun-13	Yr 2 Jun-14	Yr 3 Jun-15	Yr 4 Jun-16	Yr 5 Jun-17 (proposed)
1.3 Country has flow accounts for selected natural resources	No accounts				Water flow account for one river basin. Data completion is currently under way, and this target is pending, to be completed during the next fiscal year.	National water accounts by river basin for priority zones. It is expected that this target will be completed.	Refined water accounts
1.4 Country has experimental ecosystem accounts (if intended in country work-plan)	none		Target: 0 countries		Partial ecosystem account based on protected area ecotourism. This is pending as it has been decided that full tourism accounts must be developed, and disaggregated into protected and non protected areas.	Begin protected area ecosystem accounts, including tourism, water services and carbon capture, TBD** This is on track, as one priority area will be defined and data collected for the water and forest accounts will be used to develop an experimental tourism account.	Preliminary forest ecosystem accounts, TBD**

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Annex 1. Madagascar M&E framework (continued)

Objectives & Outcome (Results) Indicators	Base-Line June 2011	Prep year June 2012	Yr 1 Jun-13	Yr 2 Jun-14	Yr 3 Jun-15	Yr4 Jun-16	Yr5 Jun-17 (proposed)
1.5 Country has macro-economic indicators derived from the SEEA accounts (if intended in country work-plan)	None				First round of economic indicators derived from SEEA account. This is pending the organization of the workshop during which an action plan to elaborate the indicators will be devised.	Update macro indicators	Update macro indicators
1.6 Country has capacity for maintaining NCA (evidenced by dedicated government staff for NCA and regular reporting mechanism for production of natural capital accounts)	None		WAVES coordinator recruited by Government	Technical Working Group established and trained for all accounts	Dedicated staff recruited with Ministry of Economy, TBD** This has been achieved. Training continues through workshops with international expert Training has been carried out on devising mineral accounts, water stock and flow accounts, and forest accounts.	Training continues through workshops with international expert	Training continues through workshops with international expert

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Annex 1. Madagascar M&E framework (continued)

Objectives & Outcome (Results) Indicators	Base-Line June 2011	Prep year June 2012	Yr 1 Jun-13	Yr 2 Jun-14	Yr 3 Jun-15	Yr4 Jun-16	Yr5 Jun-17 (proposed)
Global Results-Based Monitoring Matrix – PDO 2							
PDO 2. To incorporate natural capital accounting in policy analysis and development planning in core implementing countries							
Outcome Indicators:							
a. NCA informs policy dialogue on growth, environment and poverty reduction, evidenced by citing NCA or using NCA indicators and data in, development plans, sector strategies and plans, executive orders, legislative documents, and the broader policy analysis literature (may include World Bank ESW, AAA and project formulation documents)	none				NCA informs PRSP and World Bank ISN. This has been achieved. Natural capital accounting features prominently in the new PRSP.	World Bank CPF uses NCA; Other use TBD with new govt	TBD under new govt

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Annex 1. Madagascar M&E framework (continued)

Objectives & Outcome (Results) Indicators	Base-Line June 2011	Prep year June 2012	Yr 1 Jun-13	Yr 2 Jun-14	Yr 3 Jun-15	Yr4 Jun-16	Yr5 Jun-17 (proposed)
Intermediate Outcomes Indicators							
2.1 Country has policy notes and analytical work based on NCA	None		Two pilot studies on fisheries and the value of ecosystem services in the CAZ watershed	1 st macro indicators policy note;	Macro indicators, water efficiency policy notes and technical reports This is pending the finalization of the accounts.	Mining and forest sector policy notes, add'l TBD with new govt This is on target.	TBD with new govt
2.2 Country has capacity for using NCA in policy dialogue (evidenced by government staff trained in using NCA)	None			Training of 20 staff on policy use of NCA by int'l expert	Continued training on uses of NCA by int'l experts Staff within the natural capital accounting service at the Ministry of Economy have received training on NCA.	Continued training on uses of NCA by int'l experts	Continued training on uses of NCA by int'l experts

^a National Steering Committee (NSC) established, Feasibility study approved by NSC and WAVES Secretariat, Stakeholder consultation on draft work plan, Work plan approved by NSC and WAVES Secretariat

Annex 2. Madagascar: Detailed Workplan, Budget and Schedule

Work Area	Objective	Expected Overall Outcomes	Planned Outputs by Year ^a				Indicative Budget (USD) ^b
			Year 1-2013	Year 2-2014	Year 3-2015	Year 4-2016	
1. Macro-economic indicators	To develop new macro-economic indicators that integrate economic values of natural resources, and that are complementary to existing indicators, are developed to guide and facilitate monitoring of sustainable development.	Macro-economic indicator development and annual revision including adjusted net savings (ANS), adjusted net national income (ANNI) and natural capital wealth	Agreement on the use of adjusted net savings (ANS), and natural capital wealth as macro-economic indicators	Macro-economic policy note	Initial estimates of new macro-economic indicators (ANS, natural capital wealth)	Revised estimates of new macro-economic indicators (ANS, natural capital wealth)	35,000
2. Mining sector	Contribute to medium to long-term policy dialogue on rent recovery, distribution and investment	Satellite account development for proven resources in large-scale mining sector, integration into macro-economic indicators, and policy analysis	Technical working group established, capacity building, structure of account elaborated	Data collection for physical stock and monetary accounts Development of first mining sector accounts	Refined mining sector accounts Commence policy analysis related to mineral rent recovery, distribution & investment	Refined mining sector accounts Feasibility study on inclusion of small-scale mining in future accounts	34,000

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Annex 2. Madagascar: Detailed Workplan, Budget and Schedule (continued)

Work Area	Objective	Expected Overall Outcomes	Planned Outputs by Year ^a				Indicative Budget (USD) ^b
			Year 1-2013	Year 2-2014	Year 3-2015	Year 4-2016	
3. Managing watersheds and water resources	Contribute to regional integrated water resources management planning	National and river basin level monetary and physical accounts for water resources and integration into macro-economic indicators, and policy analysis.	Technical working group established, capacity building, data needs assessment	Commencement of water accounts preparation—data collection and definition of key policy issues	Preparation of water stock and flow accounts Commence policy analysis related to integrated water resource management	Preparation of consolidated accounts Continue policy analysis related to integrated water resource management	290,000
4. Sustainable timber sector exploitation	Contribute to the development of a sustainable timber exploitation and PA value	Forestry biophysical and monetary value for timber in protected and non protected areas	Technical working group established, capacity building	Preparation of timber stock account—data collection	Consolidated forest accounts Commence policy analysis related to sustainable timber exploitation and PA value	Refine account Continue policy analysis related to sustainable timber exploitation	500,000

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Annex 2. Madagascar: Detailed Workplan, Budget and Schedule (continued)

Work Area	Objective	Expected Overall Outcomes	Planned Outputs by Year ^a				Indicative Budget (USD) ^b
			Year 1-2013	Year 2-2014	Year 3-2015	Year 4-2016	
5. Contribution of the tourism sector to the economy	Contribute to a policy on promotion of nature-based tourism that supports economic development and poverty reduction	Partial tourism satellite accounts, providing data on: (i) Protected area tourism's contribution to GDP; (ii) employment in protected area tourism; (iii) size and characteristics of protected area tourism; and (iv) tourist expenditure and consumption data for protected area tourism.	Technical working group established, capacity building	Tourism and operator surveys in protected areas Scoping study for full tourism account	Partial account on protected area ecotourism If feasible, commence full TSA account Commence policy analysis on ecotourism contribution to the economy	Refine account Continue policy analysis on ecotourism contribution to the economy	433,000
6. Pilot ecosystem accounts	Contribute to sustainable financing of the national protected area network	Analysis of combined ecosystem service values—ecotourism, water resources, carbon and non-timber forestry values—in selected protected areas to feed into sustainable financing policy for the PA network			Selection of protected areas for ecosystem accounts	TBD	78,000

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Annex 2. Madagascar: Detailed Workplan, Budget and Schedule (continued)

Work Area	Objective	Expected Overall Outcomes	Planned Outputs by Year ^a				Indicative Budget (USD) ^b
			Year 1-2013	Year 2-2014	Year 3-2015	Year 4-2016	
7. Capacity building	National counterparts are empowered to undertake natural capital accounting tools and use the results in policy development	Trained national counterparts in Government, research institutes and civil society	Ongoing program of hands-on technical training and facilitated involvement in project activities related to natural capital accounting tools; integration of results in policy development, and establishment and interpretation of complementary macro-economic indicators.				240,000
8. Project management	WAVES activities are managed in partnership between the World Bank and Government	A core team of World Bank and Government staff are resourced to manage and support WAVES activities	National coordinator, World Bank technical assistance, Steering Committee and Technical Working Group functioning, participation in international events, communications and outreach.				390,000
						TOTAL	2,000,000

^a An annual review of the workplan will be undertaken to develop detailed annual activity schedules.

^b Includes allocation from WAVES Multi-Donor Trust Fund of USD1.5 million and allocation from IDA-financed EP3 project of USD0.5 million.

Wealth Accounting and the Valuation of Ecosystem Services

Wealth Accounting and the Valuation of Ecosystem Services (WAVES) is a global partnership led by the World Bank that aims to promote sustainable development by ensuring that natural resources are mainstreamed in development planning and national economic accounts.

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