



PRODUCTION OF ETHANOL FOR HOUSEHOLD PROGRAM

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK ETHANOL AS HOUSEHOLD FUEL PROGRAM



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List of Abbreviations

ВОА	Banque Of Africa	
	Cadre de Gestion Environnementale et Sociale (Environmental and Social	
CGES	Management Framework)	
	Circonscription du Développement de l'Agriculture (Agriculture	
CIRDA	Development District)	
	Convention sur le commerce International des espèces de faune et de flore	
	sauvages menacées d'extinction (Convention on the International Trade In	
CITES	Endangered Species of Wild Fauna and Flora)	
CMCS	Centre Malgache de la Canne à Sucre (Madagascar Sugarcane Center)	
CNA	Centre National Anti-acrididen (National Anti-locust Center)	

	Centre National de	
CNRE	Recherche sur l'Environnement (National Environment Research Center)	
CSB	Centre de Santé de Base (Primary Health Center)	
DDT	DichloroDiphényeTrichloroéthane (dichlorodiphenyltrichloroethane)	
DPV	Direction de la Protection des Végétaux (Directorate of Plant Protection)	
	Direction Régionale du Développement de l'Agriculture (Regional	
DRDA		
DRDA	Directorate of Agriculture Development) Etude d'Impact Environnemental et Social (Environmental and Social Impa	
EIE	Assessment)	
	Etude d'Impact Environnemental et Social (Environmental and Social Impact	
EIES	Assessment)	
EPI	Equipment de Protection Individuelle (Personal Protective Equipment)	
FAO	Food and Agriculture Organization	
FOFIFA	Foibe-pikarohana ho Fampandrosoana ny eny Ambanivohitra (National	
	Center of Applied Research for Rural Development)	
FRAM	Fikambanan'ny Ray Aman-dRenin'ny Mpianatra (Parents' Association)	
GES	Gaz à Effet de Serre (Greenhouse Gas)	
	·	
GPI	Gestion Phytosanitaire Intégrée (Integrated Crop Management)	
IST	Infections Sexuellement Transmissibles (Sexually Transmitted Infections)	
MEC	Madagascar Energy Company	
	Mise en Compatibilité des Investissements sur l'Environnement	
MECIE	(Comptability of Investments on the Environment)	
OMS	Organisation Mondiale de la Santé (World Health Organization)	
ONE	Office National pour l'Environnement (National Office for the Environment)	
ONG	Organisation non gouvernementale (Non-Governmental Organization)	
OP/PO	Politique Opérationnelle (Operational Policy)	
OTIV	OmbonaTahiry Ifampisamborana Vola	
PAP	Personne Affectée par le Projet (Individual Affected by the Project)	
	Plan de Gestion Environnementale et Sociale (Environmental and Social	
PGES	Management Plan)	
	Plan de Gestion des Pestes et Pesticides (Plagues and Pesticides	
PGPP/IPPM	Management Plan)	
	Projet Madagascar Ethanol pour Energie Domestique (Madagascar Ethanol	
PMEED	Production Project for Domestic Energy)	
POPs	Polluants Organiques Persistants (Persistant Organic Pollutants)	
PPN	Produit de Première nécessité (Staple Product)	
	Programme d'Engagement Environnemental (Environment Commitment	
PREE	Program)	

RN	Route Nationale (National Highway)	
	Syndrôme d'Immunodéficience Acquise (AID: acquired immune deficiency	
SIDA	syndrome)	
SIG	Système d'Information Géographique (Graphical Information System)	
SIRAMA	Siramamy Malagasy	
SIRANALA	Siramamy d'Analalava	
SUCOCOMA	Sucrerie Complant Côte Ouest de Madagascar	
SUCOMA	Sucrerie Complant de Madagascar	
VIH	Virus Immunodéficience Humaine (HIV)	

Glossary

Anaerobic: absence of air or oxygen

Bagasse: woody part of sugarcane remaining in the mills after extraction of sugar juice

Brix: unit of measurement used to characterize the sugar content in sugar juices

Cd: Cadmium

CO2: Carbon dioxide

Cu: Copper |

DBO₅: Chemical oxygen demand

Nutrient element: All chemicals used by microorganisms as energy source

Green Economy (national definition): responsible economy that seeks the human wellbeing and social equity by addressing the basic needs of all generations while valuing the local culture, know-how, human dignity, reducing significant environmental risks and the scarcity of resources, respecting the guidelines of the plan and global and local development scheme.

Environment: All natural and artificial environments, including human, socio-cultural and climate factors of interest to the national development.

<u>Environmental and social impact assessment:</u> a study consisting of scientific and preliminary analysis of foreseeable potential impacts of a given activity on the environment, and in consideration of the acceptability of their level and mitigation to ensure the integrity of the environment within the limits of the best technologies in an economically acceptable cost. It is conducted before any decision or important commitment.

Mn: Manganese NO₃⁻: Nitrate NO₂⁻: Nitrite PO₄³⁻: Phosphate

Pyrifos: toxic organophosphate insecticides used for plants treatment

Vinasse: residue from the distillation of fermented musts

Zn: Zinc

EXECUTIVE SUMMARY

Madagascar is one of the countries that host the greatest biological diversity in the world. However, those species are extremely endangered because of number of pressures including wood charcoal production. To address this problem, the country is committed to the use of renewable energy such as ethanol production for domestic use. This production of ethanol for domestic use interests particularly the World Bank. Besides, Madagascar embraces and promotes the idea by introducing the "domestic Ethanol fuel project". Through this project, the country's economic growth rate is expected to increase. The objective of this program is the commercialization of 100,000 ethanol stoves for a period of 5 years. As an important activity of the World Bank, the elaboration of an Environmental and Social Management Framework (ESMF) is required.

Thus, the objective of this mission is to establish a sorting process and an environmental and social selection that will allow the project implementation unit to identify, assess and mitigate potential environmental and social impacts of the project activities from planning to exploitation.

For that, this study was based on literature review, observations, field surveys and public consultations. As for the impact analysis, it was evaluated according to their importance with a view to crafting a formulation of mitigation of negative impacts and optimization of positive impacts.

The Project involves number of institutional actors, public and private, with different interests and responsibilities including: Green Development SA, Clean Cooking Madagascar, Angovo Man'Eva, sugarcane farmers, micro-distilleries, the Malagasy Government and the World Bank.

The general process of pure ethanol transformation from biomass can be divided into several distinct phases: (1) sugarcane reception, (2) extraction phase of sugarcane juice, (3) Preparation phase of sugarcane juice for fermentation (4) fermentation of sugarcane juice, (5) Distillation of fermented juice.

The production of ethanol must be processed in a micro distillery that has at least the following machinery and equipment: *Press-cane, preparation tank, fermentation tank, grinding tank, distillation tank (distillation column), Boiler, pumps, and storage drum.* Those micro-distilleries intensively use water at 10,000 liters per day and require twenty people permanently. In addition, the production of ethanol fuel primarily demands a lot of energy; heat requirements may range from 10MJ / I of ethanol for small scale units. Moreover, two types of waste come out from the production of ethanol, namely bagasse and vinasse. Pure ethanol is a non-corrosive and non-aggressive substance that can be packaged and stored in a variety of plastic or metal containers.

For household users, plastic bottle of 1.5L, or can of 5 to 10 liters can serve as a storage. The containers are closed with special caps for children's safety. And featured on the label of the liquid container is a danger notice. An ethanol cooking stove is a mobile device, composed by one or two burner (s) or combustion block included in covering. It comes with a base which can be put on the floor or furniture. It is usually heavy enough to precisely avoid the risk of overturning. Actually, there are three types of risks associated with the use of domestic ethanol fuel: (1) risk of burns, (2) risk of fire and (3) risk of poisoning.

The environmental analysis of this program has identified the following environmental issues: Water consumption; Wastewater; The use of chemicals; Air pollution; Odor; Solid waste such as the bagasse; Energy use for heating. The negative impacts are: Risk of scarcity in water resources, pollution of surface water and groundwater by the vinasse spreading on the ground, Eutrophication of the water, surface water contamination by pesticides and pests, Loss of micro organic substances because of pesticides retained in the soil, risk of erosion due to development work and landscaping, odor pollution related to bagasse and vinasse, Unaesthetic piling of bagasse, Carbon dioxide emission from boilers, deforestation and disturbance of natural habitats, Risk of deterioration of natural habitats.

Identified positive impacts are: Improving access to water for the surrounding populations, use of Bagasses and vinasse as organic fertilizer, Reforestation for the unit's needs in wood, Reduction of natural forest clearing.

As of the socioeconomic impact of the program, it includes accident and health risks, fire and explosion hazards, increased transmitted diseases, disruption of the social environment / risk of social frustration in case of non-use of local labor, noise, visual and olfactory pollutions, solid and liquid waste that may result in disease risk and inflation in the implantation areas of the micro distillery. Nevertheless the production of ethanol also triggers the creation of new jobs, improvement of the income of sugarcane farmers, that of the communal administration, cleanliness and health compared to the use of wood charcoal, and the use of sugarcane residues for free or at cheap price for local people.

As part of an Environmental Impact Assessment, the environmental assessment process is aimed at ensuring the inclusion of socio-environmental parameters during the implementation of sub-projects (micro-distillery unit and / or sugar cane production unit). This process includes 7 stages, (1) environmental screening of subprojects; (2) Environmental Categorization of subprojects; (3) Environmental studies of subprojects; (4) Review and validation of study reports; (5) Public Consultation; (6) Integration of measures in the environmental and social scope statement and (7) Implementation, supervision and follow-up.

Regarding the Environmental and Social Management Plan, it represents a reference document that includes the compliance of the ethanol production project with legal requirements, commitments and responsibilities as well as the promoter policy in terms of environmental and social management. Indeed, the environmental and social management plan (ESMP) features relative guidelines to optimize the positive impacts and others related to the prevention, mitigation and compensation of negative impacts. The ESMP also mentions all the necessary resources (human and financial) for the implementation of all the proposed measures. The persons in charge of the project along with the monitoring indicators should be indicated in the ESMP document. Thus, once the calculation done, the implementation of the Environmental Social Management Framework (ESMF) and monitoring is estimated at Ariary 143,000,000.

Environmental and social guidelines are provided in this document. Those guidelines are established during the sub-project design phase, during the distillery unit construction phase and during the operational phase.

Finally, as part of the preparation of this ESMF, public consultations were conducted in order to identify the concerns of the population likely to be affected by the Project and to enable them to participate in the project implementation.

1. INTRODUCTION

1.1. BACKGROUND AND JUSTIFICATION OF THE PROJECT

1.1.1. Background of the study

Madagascar, with its several climatic zones, is one the countries hosting the greatest biological diversity in the world. However, those species are critically endangered because they are subject to several kinds of pressures, which are usually of anthropogenic pressures. The production of wood charcoal is largely responsible for the disappearance of natural and secondary forests in Madagascar.

The household charcoal consumption is very dramatic, especially for households living in cities in Madagascar (there are 172 cities in the country). Those cities are home to 37% of the total population, with about 6.9 million inhabitants. Wood charcoal is the main energy source for 90% of Malagasy households. Total consumption of charcoal is estimated at 402,000 tons in 2012.

Faced with the ever growing rate of urbanization (22% to 37% between 1993 and 2013), the government gradually considers a move towards an energy transition by favoring the use of renewable energy. It is in this context that the idea of ethanol fuel production for domestic use came into being in 2014.

This concept of producing ethanol for domestic use is of great interest to the World Bank considering the economic, social and environmental impacts it would generate, and possibly its potential. Besides, the Malagasy Government has a real interest in it and promotes the idea by introducing the "Domestic Ethanol Fuel Project". With this project, the country's economic growth rate is expected to grow.

Through the program, the commercialization of 100,000-unit of ethanol stove for a period of 5 years is anticipated. Those stoves should be accessible, and will be funded by a carbon credit from the World Bank. It is therefore a grant for each stove or burner sold (not the fuel) thanks to the carbon financing. As a matter of fact, it is important to ensure the supply of ethanol to sustainably meet the needs of 100,000 end-users. As an important activity of the World Bank, implementing an Environmental and Social Management Framework is of great need.

1.1.2. Textual preparation of the ESMF

This Environmental and Social Management Framework is established to ensure a successful environmental and social management of any project of ethanol production facility construction (called "sub-project" in this document) regarding its implementation, and ensure its compliance with national environmental legislations, as well as the social and environmental safeguarding policy of the World Bank. In addition, the framework allows to assess the environmental and social impacts and propose mitigation or optimization measures of these impacts from the preparation stage of the sub- project facility, the operation of the unit, the sugarcane plantation activities related to fuel storage to the handling by the end-user.

1. Ministry of State in charge of Presidential Projects, Spatial Planning and Equipment. 2015
2. Diagnosis of the energy sector in Madagascar. Document prepared by the WWF in 2012 in partnership with the Ministry of Energy.

1.2. REMINDER OF THE ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK OJECTIVES

The objective of the Environmental and Social Management Framework (ESMF) is to establish a sorting process of environmental and social screening that will allow the structures in charge of the implementation of the project to identify, assess and mitigate the environmental and social impacts as well as the potential of the project activities from the

planning to its operation. As such, it serves as a guide to the development of the specific Environmental and Social Impact Assessments (ESIA) of sub-projects and sub-sectors (actors) affected by the Project whose sites and the environmental and social characteristics remain unknown.

The environmental and social review process of the ESMF will be integrated in the approval process and the general funding of sub-projects; its compliance with the currently enforced national framework will be ensured. The implementation of a ESMFP takes into account the safeguard policies of the World Bank and the national legislations for each project activity. The ESMF also determines the institutional arrangements to be made during the implementation and monitoring of the program's activities, including those related to capacity building.

Thus, the ESMF will allow persons in charge of the project implementation from the planning stage to identify assess and propose measures to mitigate potential environmental and social impacts related to the project's activities.

1.3. GLOBAL METHODOLOGY APPROACH

This study was based both on the bibliography of observations, field surveys and public consultations. Observations and investigations were conducted at a pilot site of ethanol fuel production in the District of Brickaville, in the Atsinanana Region. Alongside the interviews with the officials of the unit and its employees, the idea to take samples of water and soil at various sensitive locations for laboratory analysis in Antananarivo was also discussed. The results of those analyses allowed to have a more precise idea of the potential impacts of micro-distilleries on various components of the biophysical environment.

Field work continued in other two regions, namely in Analanjirofo and Bongolava where micro-industrial ethanol production units are being constructed. Public consultations were conducted in those three areas with local authorities, sugarcane farmers, neihboring populations of micro-distilleries and end-users taking part in it.

The general description of the receiving environment allows to understand the ecological, socioeconomic and cultural context of the environment in which the project is carried out, to distinguish the most sensitive environmental components with regard to the production of ethanol and identify beforehand, some environmental issues related to the activity.

The technical description of the production allows identifying the sources of impacts, from the technical characteristics of the equipment in the production chain.

Then comes the analysis of actual impacts: identifying the actual and potential impacts, assessing their importance following the approach described here below. Thereafter, it will logically sort out environmental issues.

Finally, the process will lead to the formulation of the mitigation of negative impacts and optimization of the positive impacts.

The next step is to develop the Environmental and Social Management Plan (ESMP), which includes the mitigation of negative impacts, the environmental and social follow-up and monitoring, institutional measures as well as the programming of activities.

The mitigation is aimed at reducing the scope or eliminating the anticipated negative impacts. In most cases, the preferred mitigation measures are those whose effectiveness has already been tested in similar projects. This is followed by the evaluation of residual impacts

of the Project by anticipating the expected success of the proposed mitigation measures and that, in consideration of the experience gained in previous projects.

The environmental monitoring and follow-up measures apply to major anticipated impacts of the Project and to the environmental components with the greatest current concern.

Those measures aim to ensure the implementation of recommended mitigation measures so that they produce the anticipated results and undergo change, suspension or replacement if they are proven to be inadequate.

Thereafter, the ESMP identifies the responsibilities of the various stakeholders for the implementation of the impact mitigation measures with the environmental and social follow-up and monitoring. Finally, the ESMP sorts out the monitoring program and institutional arrangements.

2. DESCRIPTION OF THE DOMESTIC ETHANOL PROJECT 2.1. BACKGROUND

Madagascar's forest actually covers less than a quarter of the national area, over 70% of which is made up of vegetation. The forest formations cover a total area of 13.26 million hectares of the national territory. The deforestation rate is up to 22.6%, which is low enough to allow the remaining tropical forests to ensure climate control and ecosystem balance. Clearing is one of the causes of loss of Malagasy forests. Alongside this, there are also bush fires which accelerate the erosion phenomenon and limit reforestation initiatives. We recognize that reforestation can not compensate forest degradation given the weakness of human, material and financial resources deployed.

Moreover, the production of wood charcoal is another factor behind the increasing loss of forests. Wood charcoal comes from three main sources: the exploitation of natural forests, peasant plantations and industrial plantations. Statistically, the production represents 3.8 million hectares of natural forests and 265,000 hectares of managed forests. For industrial plantations, the activity is processed in the concession of Fanalamanga company, covering a total area of 65,000 Ha.

Therefore, population growth and consequently the increasing need in energy ended up endangering the forest resources in Madagascar. The energy supply is guaranteed up to 92% by wood energy. The latter is mainly used as a fuel for cooking. Firewood is the type of wood energy consumed by 82.2% of households, while the wood charcoal is consumed by 17% of Malagasy households.

In a yearly basis, a consumption of 402,500 tons of wood charcoal is estimated in 17 regions of Madagascar. This consumption is still increasing although the price of charcoal saw an annual steady increase of 9% to 15% between 1988 and 2012.

It is in this context that the Domestic Ethanol Project is created, which ultimately aims at protecting the environment and combating deforestation in Madagascar

.2. OBJECTIVE OF THE PROJECT

The Project includes the distribution of ethanol stove for domestic use thanks to the funding by carbon credits. Concretely speaking, it entails the commercialization of 100,000 ethanol stoves for 100,000 households at an accessible and affordable price, and that, for a period of 5 years. To this end, the project aims to reduce greenhouse gas emissions by maintaining existing forests, that is, by reducing the use of wood charcoal.

It is clear that the promotion of combustion equipment goes with fuel production to meet the needs of 100,000 users. To do this, the Project promotes the production of ethanol by small production units called "micro-distilleries." Given the innovative nature of this micro-industrial activity, the provision of technical and financial support to potential ethanol fuel producers in the making of the product itself can be considered. Subsequently, the construction of several production units is expected, which must be geographically distributed fairly in the country.

Diagnosis of energy sector in Madagascar. WWF.2012

The activity will gradually be expanded during the five-year period of the Project. Thus, the price of the stove and that of the fuel would tend to gradually decrease compared to the start-up phase thanks to economies of scale.

The direct and indirect beneficiaries of the Project are:

- Households, ethanol stove end-users: whose direct benefits include improved health and reduction of wood charcoal consumption;
- Producers and dealers of ethanol fuel thanks to the economic benefits of the activity;
- -Sugarcane farmers, which is the main raw material of fuel thanks to the improvement or even the stability of their income;
- Local and regional authorities of the areas where the production units are located;
- Various economic actors involved in the area of activity.

At the regional and national level, the Project will allow the creation of many jobs, both in the micro-production unit and within the sugarcane fields.

At last, by considering environmental and national contexts, a gradual decline in forestry exploitation for energy purposes is expected. This will impact some or even larger measures on deforestation, thereby the Malagasy forests will continue to store carbon.

2.3. INTERVENTION ZONE

The Project is implemented throughout the national territory of Madagascar. Nevertheless, it is expected that the users of the 100,000 stoves are not only concentrated in some urban areas in particular, but are fairly distributed throughout the country. In this case, the micro-

industrial production units are to be scattered in several regions of the island while valuing close proximity to possible sources of raw materials, thus, the sugarcane farmers.

The production of ethanol will be ensured by private operators called implementing partners who are given the freedom to decide their option of location.

At the present, some production units of domestic ethanol are currently operating in Madagascar. Their entry into the business is very recent and generally of an experimental nature. One of those units has been chosen as a pilot site of the project.

However, potential areas for micro-distilleries construction have already been identified, namely in Brickaville, Vatomandry, Manakara, Fenerive Est, Toamasina, Toliara, Ambositra and Tsiroanomandidy.

All of them are close to large sugarcane plantation areas.

2.4. SUB-COMPONENTS OF THE PROJECT

2.4.1.Sugarcane plantations

Sugarcane is grown everywhere in Madagascar. Its plantation is seen both in the East and the West Coasts with sea level of up to 15,00m of altitude. This plant grows under optimum development and performance conditions: warm and humid climate, rich soil, exceptionally fertile alluvial valleys.

According to CMCS, sugarcane is a reliable source of income for farmers. Since the revival of the industry, the price of a ton of sugar cane averagely amounts to 50,000 Ariary. Currently, the national average yield in sugarcane production is 70 tons per hectare. The average area occupied by a farmer is about 2 Ha, an average annual production of 140 tons by farmer. In general, sugar cane production can be done either by extensive mode (farmer practice in traditional production areas) or semi-extensive mode (sugarcane farmers are located in the industrial production zones and national investors such as MEC and ETHAMAD) or by intensive and mechanized mode (the plantations are managed by production units). As f the production by farmers, the farming operations are exclusively handled manually. Farmers cultivate the cane tops and rarely renew their plantation. The yield does not exceed 15 tons per hectare.

In industrial production areas, the technique used for the planting of sugarcane is that published by the CMCS, some of which including improved production techniques are more or less controlled by farmers: cuttings (line planting), use of fertilizers, control products against weeds, crop pests and diseases.

The technical itinerary of sugarcane farming is as follows:

- Land plot development;
- Soil preparation and ploughing;
- Plantation of cuttings;
- 1st weeding;
- 2nd weeding;
- Hilling;
- Trashing;
- Harvest.

The contribution of fertilizer (organic and / or inorganic) is processed during the land working by incorporating it with the soil. The fight against biological pests can be done either preventively (by anticipating the application of pesticides to protect crops against pest attack) or curatively (by mitigating the effects of pests or by eradicating them). The best season for planting sugarcane (wet and hot season) runs from June to December. Harvesting can be carried out after 6 months. By cons, if the planting is done during the cool dry season (March to May), you have to wait 12 months to make the cut. The table below outlines the potential yields of sugarcane during the growing cycle of the plant.

° Table 1: Sugarcane productivity compared to the age of the plant.

Year	Productivity (T / ha)
Virgin cane	50
1st regrowth	70 to 80
2nd regrowth	80 to 120
3rd regrowth	70 to 80
4th regrowth	70
5th pushes	60
6th pushes	40

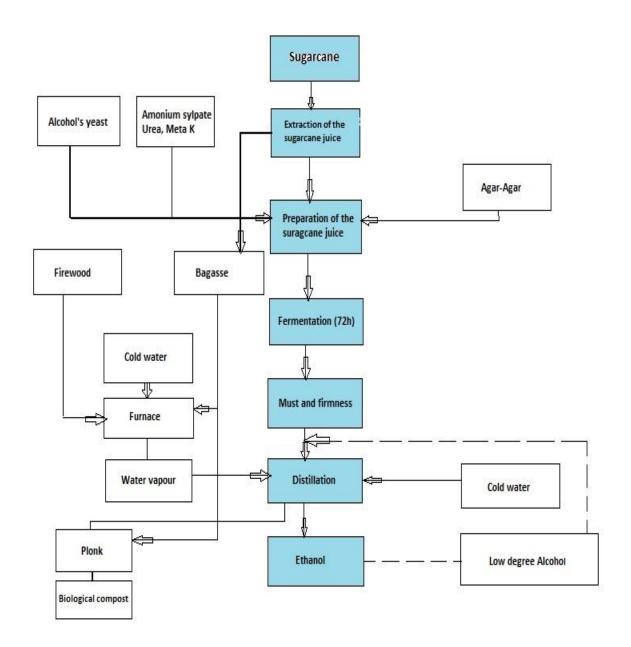
Source: BIODEV Survey from farmers in Brickaville

2.4.2 . Micro-Distillery

→ A method of producing fuel ethanol

The general process of converting biomass into pure ethanol can be divided into six distinct phases as the following diagram shows:

Figure 1: Schematic description of the production method of ethanol fuel



Source: Biodev, 2015

The transformation of sugarcane to ethanol fuel as is practiced at the pilot micro-distillery uses the following production steps:

- Handling of the sugar canes: the sugar cane harvested in the plantation is transported to the micro-distillery. The average yield of ethanol is about 80 liters per ton of sugarcanes.
- -Extraction of sugarcane juice: Before proceeding with the extraction of sugarcane juice, leaves and dirt residues on the sugarcane that may affect the juice are removed. The cleaned cane is then introduced into the press-cane to extract the juice. At its output, the juice goes through a small filter content in a funnel to remove the coarse waste. The juice is conveyed by a pipe to the preparation tank.

– Preparation phase of the cane juice for fermentation: This phase is crucial: the cane juice extracted during the previous phase must be fermented by using yeast. During this phase, the cane juice that primarily contains sucrose should be slightly acidified with Meta K (probably potassium metabisulfite) to initiate the acid hydrolysis of sucrose to turn into fermentable sugars or inverted sugars, namely glucose and fructose. Then, nutrients (ammonium sulfate or urea source of nitrogen) and yeast are added into the juice. To have clarified fermented

must, agar agar is added. And the prepared juice is then pumped into the fermentation tanks. Note that some of those products are found in the vinasse, such as nitrogen and sulfate. This explains the acidity of vinasse.

- -Fermentation of cane juice: the yeast, via an anaerobic biochemical reaction, will transform the glucose into ethanol for 72 hours. It is a reaction that releases heat and CO2. After all, the end of the fermentation can be recognized by the cooling of the fermentation tanks. The fermented juice, also called fermented must or wine ready for distillation, is pumped to the distillation columns.
- Distillation of fermented juice: the steam generated by the boiler is added into the column in order to distill the ethanol content in the fermented must. If the alcohol by volume is below 80°, the alcohol produced is then redirected to the correction tanks where alcohol is mixed with a little fermented must to continue and increase the alcohol by volume after redistillation. The alcohol by volume can reach 87°. However, the residue of the distillation called vinasse is recovered to be mixed with the bagasse, which, after maturation, becomes organic compost that can fertilize crop fields.

→ Description of a micro-distillery

According to this sugarcane-to-ethanol transformation process, a micro-distillery must have a minimum of machinery and equipment as described below:

- Cane-press: it is a small machine used to press sugarcanes in order to get the juice. This machine works by adding the cane sticks between the two toothed pressing mills.
 Depending on the type of sugarcane being pressed, the sugar by volume varies between 12 to 17° Brix. The machine runs with electric current.
- -Preparation tank: This is a large container with one hundred-liter capacity which serves to mix the cane juice with nutrients consisting mainly of ammonium sulfate or urea, Meta K and leaven (yeast made up of Saccharomyces cerevisiae). To speed up the settling of suspended substances in the fermented must also know as "wine", the extract of an algae, agar agar, is used.
- -Fermentation tank: Depending on production capacity, a micro-distillery may have a set of fermentation tanks. These tanks are used to contain the juice from the preparation tank during the fermentation period that may last several days. After transferring the wine to the distillation column, ferments residue are settled down on the bottom of the fermentation tanks and are reusable for fermentation for the next juice.

- –Rectification tank: It is used to increase the alcohol by volume below 80° during the distillation phase. It consists of mixing in the tanks the low-level alcohol with some fermented must and allowing fermentation to continue to completion. The end of the fermentation is known through a system made of small pipe coming out of the tanks, and whose end is immersed in a small bowl containing a little water with bubbles. The resulting mixture can be redistilled again to have a higher alcohol rate of up to 87°.
- —Distillation tank (distillation column): it is used to distil wine or fermented must from the fermentation tank. It is supplied with water steam produced by boilers for distilling alcohol, and with cold water pumped from water storage tanks for the condensation of the alcohol vapor.
- Boiler: The boiler used to produce steam from the distillation columns to provide the fermented must with heat in order to evaporate the alcohol substance. Boilers may be heated with wood and / or bagasse.
- -Pumps: They are used for the transfer of the wine or fermented must from the fermentation tanks to the distillation columns.
- -Ethanol storage drum: Before the ultimate phase, the processed alcohol is stored in plastic drums of 100 to 200 liters. Note that the ethanol is mixed with a small portion of dye to prevent people from drinking ethanol.

→ Water used by a micro-distillery

Like any sugar production plant, the production of ethanol requires a large amount of water for the different production processes. It takes about five liters of water to produce 1 liter of ethanol from sugar syrup.

For a micro-distillery with a daily production capacity of 2,000 liters of ethanol, it must ensure a supply of at least 10,000 liters of water per day.

When coming out of the distillery, the water used in the production of alcohol are generally removed using the spraying method.

→ Workforce employed by a micro-distillery

Personnel requirements for an ethanol plant, independent of management, mainly consist of the process technicians.

Ten employees permanently ensure the daily output of more than 1,000 liters of ethanol. In addition, many seasonal workers may be required in case of overproduction and sugar cane harvest period.

The size of the distillery affects the number of employees within the facility. Nevertheless, here are the main positions or functions required:

- Production Manager or Head of Unit
- Checkpoint and boiler agent;
- Input transformation agent;
- Distillation monitoring agent;
- -Residue and waste management agent.

Whatever the responsibility within the plant, the occupational risks related to the nature of the activity are not to be taken lightly for any ethanol production distillery.

→ Energy Resources

During the ethanol production process, the distillation requires a significant amount of energy. The distillation process involves the evaporation of the water-ethanol mixture resulting after the fermentation usually in the form of steam, for which much heat is required. The amount of heat required depends mainly on the fermented ethanol volume and energy efficiency of the technology used. The heat demands can range from 10MJ / I for small-scale production units. This represents approximately 1kg to 2kg of wood energy. However, it is important to emphasize that energy efficiency of sugarcane ethanol is much higher and stronger since the distillation requires few inputs, and is provided essentially by the burning of bagasse. Subsequently, the use of wood, dry or wet, is formally to be reduced or avoided in this project since it is quite contrary to the idea of sustainable management of forest resources. If it is relatively unavoidable to use wood energy, the latter must only be used to only provide fire early in the process, and the fire should immediately be revived using bagasse.

As a comparison guide, the following table gives the equivalence of calorific energy of wood and bagasse:

Data for source of energy on wood and bagasse

	Humidity	Inferior Calorific rate (LHV) ¹
Product	%, dry basis	MJ/Kg ²
Dry firewoods or logs	3	15
Wet firewoods or logs	20	9
Bagasse	40-50	8.4 – 10.5

Source: FAO, Woodfuel survey, 1983

In short, to produce 1,000 liters of sugarcane ethanol, a ton of bagasse for combustion is needed. This ton of bagasse represents just over 10% of residues from the processing of 12.5 tons of sugarcane required for this 1,000 liters of ethanol.

→ Production

1 It is the amount of heat that is actually available for capture and use, during the combustion process.

² Which means 1 kg of product gives a certain value of MJ.

To be eligible for the program, a micro-distillery must have a production capacity of between 200 and 5,000 liters per day with an alcohol by volume of at least 90%.

To meet the ethanol consumption needs of the 100,000 households using ethanol stoves, the Project considers producing a progressive volume of ethanol during the 5-year period, starting with 1.176 million liters the first year. This first production is expected to triple in the second year to reach 3,000,000 liters.

4.This is heat volume that is actually available to capture and use during the combustion process.

5.That is to say 1 kg of product gives a certain value of MJ.

It is expected that a greater part of this production can be achieved by some microdistilleries chosen as pilot units. The potential total production of those units is estimated at 3.875 million liters per year.

At this stage, the fully operational micro-distillery produces between 1,000 liters to 1,500 liters per day if its capacity is 2,000 liters per day. Otherwise it is not already running at full capacity due to lack of raw materials.

Assuming a mid-term commercialization of 100,000 ethanol stoves, the supply of fuel must be assured in absolute mode, representing an annual production of 36 million liters of ethanol. In this case, the increase in number and the development of the units to achieve the sixty micro-distilleries spreading over the country is anticipated.

Distilleries with a daily production capacity of less than 200 liters of ethanol can provide ethanol fuel to the program only if its structures comply with the environmental and social requirements. However, they do not receive CCM's technical support related to the design, installation, training or activities of a micro-distillery.

Distilleries producing 5,000 liters of ethanol in a daily basis must obtain approval from the GoM (Government of Madagascar) and will not be part of the support program provided by TLC. However, those distilleries can provide ethanol to the program if they have a certification with respect to their compliance with the program requirements. But they have no right to enjoy the CCM's support regarding the design, installation, training and technical assistance.

→ Description of residues

Two types of waste are generated by the production of ethanol, namely bagasse and vinasse. A micro-industrial unit producing 1,000 liters of ethanol per day should process nearly 12.5 T of canes. It entails an output of 9 tons of bagasse per day and 5,000 liters of vinasse.

Bagasse is the first industrial waste from sugarcane. It is a fibrous product with small rods obtained after pressing the cane and juice extracted. What comes out is 70% of juice and 30% of bagasse.

Bagasse is biodegradable in 45 days. It still contains water (about 50% at the exit of the canepress), and 50% of fibrous parts: residual sugars, lignocelluloses including polysaccharides (cellulose and hemicelluloses), lignin and incombustible inorganic material. As noted above, this material will be used as energy resources for the boiler.



Figure 1: Bagasse

Vinasse is an aqueous residue from the distillation of alcohol. For 1 liter of ethanol gives about 5 liters of vinasse.



Figure 2: Vinasses

2.4.3. Retailers and Distributors

Distributors are local relay partners financially supported by Green Development. To qualify as a relay partner of the program and be eligible for the above financing, they need to to sell their stoves and fuel at low price.

As a matter of fact, distributors should:

- Sign a partnership agreement with Green Development;
- Only sell products from certified producers;
- Ensure that the ethanol fuel proposed for sale is not only of purity of at least 90% but also easily distinguishable and colorful;
- Provide training to retail dealers on the stove sale mode;
- Ensure that stoves sold are approved by the program and have three-year warranty;
- Ensure that ethanol is kept safe at all times.

2.4.4. End consumers

End consumers are households in all regions of Madagascar, particularly in rural areas. Recall that the objective of the project is to target 100,000 households using ethanol burner.

→ Packaging of domestic ethanol

Ethanol is highly inflammable in liquid state. Ethanol gives off vapors that could easily ignited by a flash point of 16 °C.

The natural color of the liquid from the exit of the distillery tanks is transparent white. But the pilot unit added a blue tint to distinguish the alcohol to be burnt from other liquid, and to prevent further poisoning accident.

For household users, the ethanol fuel is packed in 1.5-liter plastic bottle or a jug with 5 to 10-liter capacity. The recipients are closed with special caps whose opening is difficult for children. And the label of the bottle contains a danger notice.

The combustion of ethanol produces no smoke or combustion residue, and is virtually odorless except when starting and extinguishing the flame.

→ Ethanol stove

Ethanol stoves as those currently marketed in Madagascar is a mobile device consisting of one or two burner(s) or combustion blocks included in a covering. It comes with a base that can be put on the floor or furniture. It is practically heavy enough to precisely avoid the risk of tipping. The inner of the stove is called "burner". It is the vessel where the fuel is poured in and is ignited manually. The burner capacity ranges from 1.5L to 5L depending on the model of the producers. Filling is performed either by the flame exit tube, or by another specific trap. The flame can be adjusted, always depending on the model. Subsequently, its autonomy can vary from 2:00 to 8:00, for an average consumption of 0.6 liters of fuel per hour. The fuel is poured manually into the burner. The stove will turn off by itself once the fuel is depleted or by smothering the flame.

There are currently two forms of ethanol stoves sold on the Malagasy market (sales made outside the framework of the Project): single and double-fire stove.

3. BASIC ENVIRONMENTAL DATA ON THE PROJECT'S INTERVENTION AREAS

Madagascar is an island located at 400 km off East Africa. The country covers an area of 587,000 square kilometers, with nearly 8,000,000 Ha of arable land (representing about 13.6% of its territory, of which 2,000,000 Ha are exploited).

3.1. DESCRIPTION OF THE NATURAL ENVIRONMENT

3.1.1. Physical environment a) Land relief

The land relief is very rugged and consists of a continuous mountain mass whose summits exceed 2,500 m and an average altitude of between 1,000 m to 1,500 m. The eastern slopes are very steep and the corresponding coastal plains get larger towards the Indian Ocean. By cons, the western side has gentler slopes with great plains extending to the Mozambique Channel.

b) Soil

Madagascar is home to a wide variety of soils divided into four main types:

- Lateritic soils,
- -Ferruginous tropical soils,
- -Hydromorph soils;
- And unsophisticated alluvial, yet very fertile soils; they can be found in immediate vicinity of major rivers.

Lateritic soils are found in the most ancient metamorphic land basement. The alteration's sizes is often considerable. They are especially found on the eastern side of the island. Ferruginous tropical soils occupy larger surfaces of the West and the Southern part of the island and represent 27.5% of the country.

The hydromorph soils are found in large areas in some tectonic depressions of highlands and in most floodplains from all parts of the island, except in the extreme south. Saline soils are frequent in the low western coastal plains and are generally linked to the fluvio-marine water environment.

As of alluvial soils, they are much more widespread in the West Island. They essentially differ from other soils thanks to the mineralogical nature of the materials provided by watersheds and by the degree of the absorbing complex saturation.

c) Climate

Madagascar almost lies entirely in the tropics. With its geographical location, the country is subject to the influence of the low-pressure inter-tropical zone in the North and the high-pressure ocean cell in the South.

Alongside its geographic exposure, there is also the influence of the land relief and the latitude, creating a great diversity of climate within the country. There are two main seasons in Madagascar: the cool and hot/warm season. The essential difference between the two seasons is the result of the intervention of the low-pressure inter-tropical zone in warm season. The hot season is characterized by heavy rain and thunderstorms, and sometimes tropical cyclones affecting all regions of the island. As of the cool season, from April to October, it is synonymous of drought in the western regions with scattered rains and transient rain showers in the eastern regions.

d) Hydrography

The Madagascan river system has a wide variety of forms owing to its geo-morphological context. The river system is quite large, from small to large and long rivers (especially in the western cliff). There are also many lake areas.

e) Erosion

Relatively permeable and soft terrains can be of great thickness (in the highlands, lateritic soils can frequently be of 10-m thick). Usually they are poorly protected by vegetation, and are subject to heavy rainfall, are situated on very hilly terrain and are experiencing heavy erosion. Such erosion often leaves traces that we call "lavaka" especially in the highlands. We must admit that the forms of erosion vary from one region to another because of the diversity of terrain, climate variations and vegetation cover. The most distinguishable of them are the accelerated erosion (rapidly progressing erosion) and surface erosion. Accelerated erosion occurs mainly in upland areas where the soil layer is very thick, while surface erosion is encountered almost everywhere on the Big Island, except in the rainforest of the East Coast.

In the south, and in the western sedimentary areas, rainwater brings about large amounts of sand that gradually fills all depressions in.

3.1.2. Biological environment

a) Plant formations

Plant formations encountered in Madagascar can be divided into five main categories:

- Dense rain forest of the western slope in the south side of Tsaratanàna and Sambirano Region;
- Secondary vegetation or "savoka", also in the eastern slope of the country;
- Dry forests of the West;
- Xerophilous forest of the South;
- Grasslands or savanna in the highlands and the middle-west of the North and a narrow strip of forest in the south-east coast.

Alongside those types of vegetation, there are specific forms of marshlands and shores (mangroves) especially in the West as a result of relatively high tides and the presence of deltas or large estuaries. Those forms of vegetation only occupy a small portion of the country.

b) Biodiversity richness

The biodiversity richness of Madagascar is a particularly lively discussion in the world. The country is home to a large plurality of species of fauna and flora, almost all endemic. The island is best known for its lemurs that inhabit different types of forests - dry and cool tropical. For plant species, its endemism rate is estimated at 80%. However, many of those

specimen are threatened with extinction mainly because of the rapid and alarming deforestation.

3.2. SENSITIVE AREAS

According to the Inter-ministerial decree 4355/97, a hotspot is defined as an area consisting of one or more biological, ecological, climatic, physical-chemical, cultural, socio-economic elements..., characterized by a specific value and fragility with regard to human activities. The different types of hotspots encountered in Madagascar are: coral reefs, mangroves, small islands, rainforests, erosion-exposed zones, arid or semi-arid regions prone to desertification, wetlands, natural conservation areas, drinking water protection areas, mineral or underground and palaeontological, archaeological, historical sites as well as their protection perimeters.

3.3. DESCRIPTION OF THE HUMAN ENVIRONMENT

In 2013, Madagascar's population was estimated at 23 million with urban occupancy at 6,900,000 residents. The country's population growth is high, at 2.8% per year. The majority of this population is founded in the central highlands.

According to the Human Development Index (HDI), Madagascar was in 2013one of the poorest countries in the world, with an HDI rank at 146th out of 177 countries. In cities, wood charcoal is the main source of energy for more than 90% of households. Gas fuel is consumed by only less than 2% of the population. Rural citizens, for their part, use firewood.

3.4. DESCRIPTION OF THE ECONOMIC ENVIRONMENT

Demographic statistics show that nearly 75% of the population live in rural areas. Moreover, rural sector has always been the key sector in the Malagasy economy with almost 43% of its GDP including agriculture, livestock, fisheries, forestry and downstream food industries. Consequently, the sets of development policies the government applied have successfully generated more answers to the problems of rural areas.

Speaking of economic development, the last twenty years are characterized by a succession of three national policies and strategies. For the first period from 1996 to 2001, the government adopted the Economic Policy Framework Paper (EPFP) that features the withdrawal of state fund with regard to production activities and the expansion of free-zone firms. The Poverty Reduction Strategic Plan (PRSP) adopted in 2002 to 2006, whose orientation axes include to some extent the reinforcement of the liberalization of certain sectors and give a prominent place to the private sector as a strong economic growth driver. Finally, the Madagascar Action Plan (MAP) developed in 2008 to 2012, has highlighted the food-processing sector.

All those development policies and strategies have successfully identified agriculture as the main growth sector. This conception makes reference to the national statistics showing that (1) the rural population, composed by farming households accounted for almost ¾ of the total population, and (2) agriculture accounted for almost 28% of the National GDP.

The contribution of the industrial sector is still lower, not exceeding 16 % of the country's GDP. While the GDP share of the trade of goods has fluctuated between 25% and 60% over the past 20 years (excluding the two years of crisis in 2002 and 2009 when GDP values were negative). The non-formal sector actually represents a significant share of the production (especially with small retailers of goods and jobs), which is 24% of the National GDP

4.INSTITUTIONAL BACKGROUND PROJECT

The project involves a number of institutional institutions, public and private, with different interests and responsibilities.

1. GREEN DEVELOPMENT

Coordination and implementation of the Project will be under the full responsibility of GREEN DEVELOPMENT, which at the same time ensures the technical supervision.

Green Development AS is a Norwegian company that will support the program through the funding of carbon credits. The company will own the carbon credits generated by the use of ethanol stoves sold in the Malagasy households in the program. Those carbon credits will then be sold to Ci-Dev by The World Bank.

Green Development AS will support the program:

- with the annual payments of LPIP
- with the funding of CCM
- with the replacement of the CCM in its support function if the latter is unable to handle its role.
- By ensuring that the carbon credits issued are transferred to the Ci-Dev

Green Development will cover all costs associated with the monitoring, verification and issuance of the carbon credits.

2. CLEAN COOKING MADAGASCAR

Clean Cooking Madagascar represents Green Development SA in Madagascar for all activities with regard to the Ethanol Fuel Project. Specifically, the agency performs the following functions:

- Promote the use of ethanol by households through communication and awareness actions;
- Incite entrepreneurs to invest in the production of ethanol, that is to –say, by the establishment of micro-distillery;
- Ensure the capacity building of Angovo Man'Eva;
- Ensure the compliance of all stakeholders directly involved in the Project with the process of social and environmental safeguards;
- Provide training and technical support to sugarcane planters, with the aim to sustainably increase the efficiency of the production itself.

The CCM can gradually delegate its functions to Angovo Man'Eva. In this context, it is also possible that the financial support from Green Development would directly go to Angovo Man'Eva without passing at CCM.

3. THE MALAGASY GOVERNMENT

It is expected that the Government provides technical support and Project. For this, the establishment of a Steering Committee whose Chair will be ensured by the National party is anticipated. The committee will be composed of personnel from several ministries directly involved in the project, namely the Ministry for Industry, the Ministry of Energy, the Ministry in charge of Agriculture, the Ministry for the Environment, the Ministry of Economy, the Ministry in charge of Water and Sanitation.

The roles of the Government of Madagascar are numerous and come in different forms:

- Withdrawal of importation duties and taxes, and VAT on ethanol stoves;
- Withdrawal of import duties and taxes on the equipment and machinery used in micro-distillery;
- Reduction of duties and taxes and suppression of VAT on ethanol fuel;
- Implementation of simplified measures with regard to the issuance of authorization to exploit and produce ethanol.

4. WORLD BANK

The World Bank manages the funds from Ci-Dev, which will finance the project through the purchase of carbon credits. It ensures that Green Development can provide the agreed support, either directly to the Project, or through the CCM.

5. ANGOVO MAN 'EVA

Angovo Man'Eva is an association or a platform bringing together stakeholders concerned with the Ethanol Fuel Project in Madagascar. It is entrusted with the following responsibilities:

- Support the interests of the stakeholders involved in the Project;
- Promote the Project, and incite other actors to take part in it so that the Project can go forward;
- Conduct an assessment and make recommendations on behalf of members and potential members on areas suitable for the production of ethanol, as well as areas with significant ethanol consumption potentiality;
- Back the CCM up and gradually take over the duties and functions of the latter, including support for micro-distilleries;
- Ensure that all actors directly involved in the project apply the rules and requirements with regard to social and environmental safeguards.

6. NATIONAL OFFICE FOR THE ENVIRONMENT (ONE)

ONE is the operational body, delegate responsible and a one-stop workshop ensuring the compatibility of the investments with the environment, and is under the supervision of the Ministry of Environment.

In this project, ONE's role is to (1) ensure the implementation of the Decree MECIE that applies to the project and to establish or confirm the "screening" on the basis of the brief description of the project and its area of establishment. In other words, ONE is responsible for monitoring the PREE of each sub-project concerned, such as micro-distillery and sugar cane plantations. It thus requires the submission of environmental monitoring report according to the established scope statements.

7. MALAGASY SUGARCANE AND SUGAR-PROCESSING CENTER

It was established in 2013 with the Decree No. 2013-254 of April 09, 2013, the Malagasy Cane and Sugar Center (CMCS). Among its main tasks, the Centre is assigned to regulate the sector and ensure the development of sugarcane production and related products, and promote the production of bio-fuel from sugarcane.

The Centre is a key player in the sugarcane sector in Madagascar. The scope of its attributions is vast, so it intervenes both upstream (cane production) and downstream of the industry (processing units). For information, here follows are the responsibilities of the Centre (not exhaustive):

- Collect, process and disseminate technical and economic data of the industry, and ensure its computerization;
- Promote the use of environmentally-friendly techniques and processes among sugarcane farmers and factories;
- Provide farmers and unit operators with technical assistance, advice and capacity building;
- Promote sugarcane agribusiness from the construction of the production units, its operation, optimization of technological processing and marketing of derivative products;
- Promote the consumption of the processed products on local market, nationwide, regionally and internationally;
- Etc.

It comes as an evidence that the CMCS is part of the Project's Steering Committee although the Ministry for Agriculture is already represented.

8. SUGARCANE GROWERS

The sugarcane planters ensure the supply of sugarcane to micro-distilleries. Those farmers will also receive technical support from the Project through the CCM in terms of techniques on how to increase sugarcane output effectively and sustainably.

Farmers are required to produce only on lands that are chosen only to sugarcane plantation (before or after the Project implementation).

The ethanol fuel producers, for their part, ensure that the sugar cane from the fields and farms that respect the environmental clauses of the Project. In other words, the plantation areas should be sustainably cultivated, that is to say without the need of deforestation practices and no involuntary resettlement from other persons should be undertaken.

It is important to clarify that no sugar cane plantation is made in sensitive areas, otherwise such operator would be ineligible for the Project (see the list of sensitive areas 5.1.4).

9. MICRO-DISTILLERY

As part of this project, only micro-distilleries that meet the project's specific requirements are allowed to produce ethanol. Those micro-distilleries must comply with the social and environmental safeguards requirements. They also must meet certain conditions, and in return receive a certification from Green Development.

Technical and financial supports for micro-distilleries working with the Project will also be provided. Such support goes through the CCM.

Those production units are expected to effectively produce ethanol based on their own technological conception by using materials and equipment of their choice. Nevertheless, Green Development, through the CCM can provide advice and recommendations on the matter and may also establish some production standards to meet.

It is important that the micro-distilleries comply with the national regulations and the requirements of the World Bank as follows:

- Management of waste from the ethanol production, in such a way to reduce and limit the negative environmental impacts;
- Use of renewable energy within the production unit;
- Respect and application of security, safety, sanitation and health rules of the workers;
- Etc.

It should also be underlined that in order to be eligible for the project, micro-distilleries should not be located in areas called sensitive or hotspot (see Section. 5.1.4).

Ethanol produced from micro-distillery should have a color that distinguishes it from other types of alcohol. The ethanol produced should have a "degree of purity" of approximately 90%. Moreover, micro-distilleries are required to possess a database of its production and sales from retailers to distributors.

10. ETHANOL FUEL AND ETHANOL STOVES DISTRIBUTORS / RESELLERS

As noted above, distributors are local relay partners financially supported by Green Development. To qualify as a relay partners and obtain the above financing, they are required to sell their stoves and fuel at low price.

5. LEGAL AND REGULATORY FRAMEWORK REGARDING ENVIRONMENTAL AND SOCIAL MANAGEMENT

Several legal frameworks related to some areas and sectors must be analyzed for this domestic ethanol production project. The most affected sectors are obviously the environment, industry, energy, water - sanitation and hygiene, health and safety of workers. In parallel, there are operational policies of the World Bank on the social and environmental safeguard policy.

1. NATIONAL LEGAL AND REGULATORY FRAMEWORK

Among the texts and legislations governing the environment and industry in Madagascar, six texts mainly concern the field of ethanol production, regardless of its size:

- Act n° 2013-013 on the production and marketing of ethanol fuel;
- Charter on the Environment, which is the Framework Law on Environmental rights: Act N ° 90-033 of December 20, 1990 and the currently approved Law, the actualized Charter on the Environment (Act N ° 2015-003 of January20, 2015);
- Compatibility of Investments with environment (DECREE MECIE) by de Decree N° 99-954 of December 15, 1999;
- Inter-ministerial decree no. 4355/97 on the definition and **limitation of sensitive** areas
- Decree 2004-167 of 2004 amending certain provisions of the decree 99-954 of December15, 1999 on the MECIE;
- Act on the management and control of industrial pollution policy (Act N ° 99 021 19 August 1999).
- Code of water and Sanitation (Act N ° 98-028 of December 19, 1998)
- Code of health, hygiene and security of workers (Act N ° 94-027 of October 12, 1994 and Act N ° 2011 002 of July 15, 2001).

1. Act on the production and marketing of ethanol

This act specifically crafted to implement for the first time a regulatory framework governing the ethanol industry in Madagascar, and this following a real awareness of the relevance and the potential of the sector. The activities affected by the Decree are the promotion, production, use and trade of ethanol fuel.

It is important to emphasize that the Decree clearly stipulates the empowerment of local stakeholders such as the 'Commune' and 'Fokontany' in the ethanol production activities. These attributions include control activities, authorization issuance, and the monitoring of operations that may affect the populations of Fokontany.

In this case, the payment of dividend from the activity to the Fokontany is expected, whose regulation and implementation are under the authority of the Commune.

The Act also defines the technical characteristics of ethanol fuel, the responsibilities of local actors, such as the Commune and Fokontany involved in the activity.

By cons, it is established that the ethanol industry does not require a license but is subject to the same regime as coal (Article 10).

2. Old and actualized environment charter

The Environmental Charter is a framework act laying down rules and principles for the management of the environment, including its valuation.

Therefore, it is stipulated that all legislations, policies, plans, programs and sectoral projects must take into account ... the management of various sources of pollution, ... the fight against soil erosion and watershed management, health risks related to the environment, along with the integrated management of water resources and wetlands.

The Environmental Charter has its preeminence in the extent that its application would allow for the case of our survey (1) to strengthen the compatibility of investments with the environment and social challenges, and (2) to reconcile the population with the environment to create a sustainable and equitable development of the country (and the insertion of the unit to the local and regional level), through the green economy.

Considering the Article 9 of the updated Environment Charter which states that " any natural or legal person of public or private right, who has caused damage to the environment should bear the compensation for the damage, otherwise, rehabilitate the environment damaged ", we must now consider that any distillery unit should integrate the environmental dimension right from the preparation of its installation and during its operational phase. In the absence of prejudice, criminal proceedings can be initiated (Article 22):

- Either with compensatory obligations that will take via a regulatory act;
- Either with the payment of penalty to the state, which will be taken via a regulatory act.

These regulations comply with or respond to the polluter-payer's principle, according to which the costs from the preventive measures to reduce pollution, control, and compensation should be borne by the polluter (Article 10). On the one hand, all the costs from the environment protection measures must be known in advance and paid by the operator who is actually harming the environment with his activity.

The Environment Charter is actually divided into several regulatory acts.

5.1.3. Decree MECIE and industrial pollution management and control policy.

Derived from the Charter of the Environment, the DECREE MECIE aims to set the rules and procedures for the compatibility of investments with the environment and to specify the nature, the respective responsibilities and degree of the authority of the institutions or organizations authorized for this purpose (Article 1).

The Project thus applies to all investment projects that affect the ethanol industry as a whole, including the micro-industry such as the ethanol micro-distillery.

The MECIE Decree stipulates that any industrial unit subject to declaration in accordance with the current regulations, the act No. 99-21 of August 19, 1999, on the industrial pollution management and control policy, is subject to the approval of an environmental program (PREE), while the EIE applies to the industrial unit subject to authorization on the basis of the same regulations.

The operating industrial units in Madagascar are well categorized between the two following classifications derived from the characteristics of pollution generated from the facilities: (1) those subject to authorization and those (2) subject to declaration. Authorization and Declaration are both issued by the Ministry for Industry. A ministerial decree sets the nomenclature of facilities subject to operating license scheme and determines for this purpose the administrative procedures relating to the permit system or a simple declaration (Article 60 from the act 99-021 of August 19, 1999).

All production facilities are subject to a simple declaration that do not present hazards to the environment and consequently are not subject to the authorization of operation granted via a ministerial order. This must be the case of a micro-distillery which should be, for its part, subject to the PREE of ONE.

4. Decree on sensitive areas

The Decree 4355/97 concerning the definition and delimitation of sensitive areas is part of the implementation of the MECIE decree on the compatibility of Investments with the Environment.

In Article 2, it defines the sensitive areas as "areas consisting of one or more biological, ecological, climatic, physical-chemical, cultural, and socioeconomic elements characterized by a specific value and a certain fragility with regard to human activities and natural phenomena that are likely to modify the said elements and / or degrade or destroy the zone".

This decree also defines the types of sensitive areas encountered in Madagascar. Here follows are the sensitive areas as defined by the Article 3:

- coral reef
- mangroves
- small islands
- tropical forests
- areas prone to erosion
- arid or semiarid areas prone to desertification
- wetlands
- natural conservation areas
- protection zones of mineral, underground and drinking water
- paleontological, archeological and historical sites as well as their protection zones.

Each sensitive area is subject to the jointed decree on specific definition and delimitation.

It is important to note that according to the MECIE decree, any project likely to affect a sensitive area must be subject to an EIE.

The decree must be applied to all the ethanol fuel sub-projects if the latter concern sensitive areas such as the extension and / or the development of sugarcane fields or micro-distillery unit near or within these sensitive areas. However, it is highly recommended to prohibit the implementation of sub-projects within or close to these hotspots.

5. Code of water and sanitation

Water is one of the most important ingredients in the production of ethanol and sugarcane crop. In this case, an analytic survey of the compliance of the micro-distillery and the sugar cane plantation regarding the Code of water and sanitation is required.

The Code of water and sanitation by the act No. 98-028 of December 19, 1998 lists, among others, various other provisions on the protection of water resources, pollution of waters due to various types of waste and sanitation-related issues. Included among them are the following provisions that may apply to the industrial unit or the considered sugarcane plantation.

In terms of waste management, it is stipulated that " any natural or legal person who produces or holds waste with harmful effects on soil, flora and fauna, which pollute the air or water, and, in general, wreck havoc on the human health and environmental degradation is required to ensure the elimination or treatment of that threat"(Article 15). Subsequently, the polluter payer principle imposed by the Environment Charter is considered by the Article of the Code stating that «industrial and other waste from authors of any kind must hand those

threats in circuits to ensure the protection of the environment and deal with the transportation costs, disposal or treatment "(Article 16).

Regarding the sanitation component, it is also said that "the industrial wastewater of any kind to be purified must not be mixed with rain water and industrial wastewater that can be discharged into the natural environment without treatment. However, this mixture can be made if the dilution that comes out causes no difficulty in sewage treatment duly certified by an authorized test laboratory " (Article 22).

The Code of water and sanitation comes with a set of Implementing Decree, including the Decree No. 2003-943 on the spills, runoff, discharges, direct or indirect deposits of liquid waste in surface water or groundwater areas.

By referring to the Article 4 of the Decree, it is recognized that the micro-distillery is subject to the provisions of this Decree, insofar as it is a facility owned and operated by a private natural or legal person, which can bring harms or incovenients for water resources, for health, for the protection of nature and environment.

6.5.1. Code of hygiene and security in the work environment

The Code of Hygiene and Safety in the work environment stated by the Act No. 94-027 of October 12, 1994 applies to the Ethanol fuel production unit. The Code comes with a set of general provisions and measures relating to health, safety and protection against certain risks related to work, the work environment. Listed among them are following measures:

- Supplies of adequate equipment and apparels to protect the life, health of workers against all inherent risks at workplace;
- Prevention against all types of accident according to mandatory security standards;
- Maintaining of cleanliness and freshness in workplaces;
- Availability of drinking water, sanitation equipment and other comfort for workers;
- Etc.

I should be noted that the Act No. 2011 - 002 of July 15, 2001 on the Code of Health, stresses once more on the provision of drinking water in any workplace: Article 33: " workers should have drinking water available for them".

2. THE WORLD BANK'S SOCIAL SAFEGUARDING POLICY AND CONCORDANCE ANALYSIS WITH THE NATIONAL LEGISLATION

The World Bank has set up policies and procedures for investment loans it grant. So, the World Bank requires the borrower to comply with these policies. Parallelingly, each operation must meet these policies and procedures to ensure its quality, integrity and compliance with the mission, priorities and strategic objectives of the World Bank. These policies and procedures are mentioned in the Manual of Procedures of the World Bank. This Procedures Manual addresses the following dimensions: gender (protection of women), environment, indigenous peoples, and other sensitive issues. Generally, these policies are

designed to protect the environment and society against the negative impacts of projects financed by the World Bank.

The safeguard policies initiated by the World Bank aim to promote socially and environmentally sustainable development approaches, and to ensure that the operations do not put the people or the environment in danger. Actually, there are ten (10) groups of safeguard policies by the World Bank; with three of them concerning the ethanol project:

- OP / BP 4.01 : Environmental assessment policy
- OP / BP 4.04 : Natural Habitats
- OP / BP 4.09 : Pest Management
- OP / BP 4.12 : Involuntary reinstallation
- DO4.20: Indigenous people
- Do 4.36 : Forestry
- OP / BP 4.37 : Safety of dams
- OPN 11.03 : Natural heritage
- OP / BP 7.5 0 : Projects affecting international waters
- OP / BP 7.60 : Projects in contested zones

1. Environnemental assessment

The World Bank conducts environmental assessments (EAs) of each proposed investment in order to determine the extent and type of analysis of the environmental impact to be made, and whether the project requires the implementation of other safeguard policies. Projects are classified by the Bank into four categories (A, B, C and FI) depending on their type, location, scale and vulnerability, as well as the nature and extent of their potential environmental impact.

The EA covers the following areas: natural or biological environment (soil, air, water), health and safety of people, social aspects (involuntary resettlement, indigenous peoples and cultural heritage).

For each project to be implemented, the WB conducts environmental screening to determine the scope of the EA and the type of EA instrument to use. Then the project is classified in one of four (4) categories according to the above mentioned criteria and parameters.

- <u>Category A</u>: Project with the highest negative environmental impacts;
 - The project in Category A is subject to a complete and strict EIE.
- <u>Category B</u>: project whose environmental impacts are likely to be less severe than those of the Category A: larger scale, in local level, less irreversible effects;
 - The project in Category B requires less punctilious evaluation.
 - Category C: Project whose probability of its negative effects is minimal or nul;
 - The project of Category C does not require environmental assessment .

• <u>Category FI</u>: Project in which the WB funds via financial intermediary, in subprojects that are likely to generate negative environmental effects.

By way of summary, the following matrix is established, analyzing the compliance of the environmental policy with the national legislation.

Table 3: Concordance Analysis of the OP 4.01 with the national legislation

PROVISIONS OF the OP 4.01	ANALYSIS OF COMPLIANCE WITH THE NATIONAL LEGISLATION
Environmental and Social Assessment The OP 4.01 is triggered if a proposed project will generate risks and environmental and social impacts (negative) likely in its area of influence.	Accordance with: Act No. 003-2015 establishing the actualized National Environment Charter. Article 13: Public or private investment projects that could harm the environment must be subject to an impact assessment.
Pre-environmental Screening The OP 4.01 classifies the project according to: type, location, sensitivity, scale, nature and magnitude of its potential environmental impacts by: -Category A: Very negative, critical implications 6, diverse, or unprecedented on Environment and affecting a wider area -Category B: less serious effects on human populations and the environment and affecting the local level whose mitigation is easily conceivable - Category C: Probability of negative effects on the environment is minimal or null and following the Environmental Screening, no further EA is needed.	Accordance with: The MECIE Decree No. 2004-167 of 03/02/2004 Articles 3, 4 and 5: After a preliminary screening, the required environmental studies are classified according to the brief description of the project and its supporting environment as follows: - Environmental Impact Assessment (EIA): project located in sensitive areas under the Decree No. 4355/97 as stated in the MECIE Annex I, outside sensitive areas and not shown in Annex I, but has damaging consequences on the environment - Environmental Commitment Program (PREE): project featured in the Annex II MECIE - No assessment needed

Public participation

The OP 4.01 states that for all Category A and B projects, the groups affected by the project and local NGOs are consulted as soon as possible on the environmental aspects of the project, while taking into account their views.

Complies with:

- Act No. 003-2015 establishing the current National Environment Charter
- Article 14: Every citizen must have access to information on the environment, including those on hazardous materials and activities. The public must be involved in decisions within the framework of effective legislation and the right to participate in decisions.
- The MECIE Decree No. 2004-167 Articles 15 to 21 related to public participation in the assessment
- The Inter-ministerial Order No.6830 / 2001 stating on the modality and public participation procedures in the environmental assessment which advocates informing the public concerned by the project on the existence of the activity and collect their opinion about it.

As a summary, the ethanol fuel project is classified in Category B according to the classification of the World Bank considering the nature and extent of the potential environmental impacts of its sub-components.

2. <u>Involuntary resettlement</u>

According to the WB, involuntary, unorganized or assessment-free resettlement in the context of a development or investment project often leads to serious economic, social and environmental issues. However, there are involuntary resettlement policies that include safeguards to mitigate negative impacts, including the risks of impoverishment of the affected people.

The people Resettlement Policy Framework is another instrument required by the WB, thus prepared by the Borrower or the Investor in order to implement social protection policy along with Involuntary Resettlement Policy (OP 4.12).

The CPRP is assigned two specific objectives as follows:

- Determine the contexts and conditions with a view to:
 - avoiding or minimizing involuntary resettlement where it is feasible, exploring all viable alternatives of project conception;

- helping resettled people improve their former living conditions, their ability to generate income or at least their restoration;
- encourage community participation in the planning and implementation of resettlement;
- providing assistance to people affected regardless of the legality or land regime.
- Determine and clarify prior to the effective realization phase of the development, infrastructure and service delivery of the project:
 - the principles and processes guiding the resettlement,
 - organizational and operational measures; and
 - the elements on which the Project should be based for the activity preparation during its operation, by equitably and dully treating the affected populations as stated in the project (PAP).

As stated above, the analysis of compliance of the national legal framework with the World Bank policy has lifted the results mentioned in the following table:

Table 4: Analysis of concordance and compliance of the OP 4.12 with the national legislation

Theme	OP 4.12	National legal framework	Observations
General principle	Compensation for involuntary resettlement - Economic Rehabilitation	Compensation for involuntary displacement	The policy of the World Bank and the national legislation share the same compensation clause in common regarding the involuntary displacement. However, they differ in case of eviction of the illegal occupants of the state's private domain since the WB wants to give

			assistance to these occupants
Eligibility for compensation or indemnization	Legal owners - Customary and traditional harvesters - People losing property - People with limited access to assets and resources	 Legal owners Customary owners of the land Beneficial owners and leaseholders People losing property 	Similar provisions
	- Persons who have no formal rights or securities stating the land they occupy.		
Ineligibility	People installed on the project area following the information on the eviction	People installed on the project site following the information on the eviction	Similar provisions
Compensation	Replacement cost of the property affected depending on the valuation of assets and losses.	Only covers direct, material and some damages caused by the expropriation (the rate reflects the state of depreciation)	Divergence for compensation on the basis of the depreciated property which would not allow the affected persons to gain a replacement of their lost property

Earth	 Value with dominant pricing in the market Compensation in nature (land for land) 	- Amicable agreement or price of the property service sale	
Culture	Rate taking into account: - The species of trees / crops - Age (productivity) - The development of land crops - The price of products in high season (at the lowest cost)	Amicable agreement or price settled by an inter- ministerial commission depending on the species and age	Similar provisions regarding the nature of the species, but the national provision does not include other aspects
Assistance to resettled people	Resettlement allowance - Support	Resettlement allowance	National legislation does not provide any assistance to Internally Displaced Persons
Vulnerable people	The PO4.12 takes into account vulnerable people	N / A	No specific national policy for vulnerable people

Monitoring and	The P04.12	N/A	The national policy
assessment	provides tracking		considers no
	measures for the		monitoring or
	resettlement		assessment
	activities		regarding the new
			life of IDPs

It should be noted that the national legislation compensates the expropriation in cash. In any case, all other conventional compensation may be allowed.

Since the OP 4.12 features more advantageous clauses to displaced persons, they will be ruled as part of the project. A CPRP document is developed specifically for this ethanol fuel project.

As a conclusion of this project's legal framework analysis, it is recommended that:

- Because this Project falls in the Category B by the World Bank, conducting a PREE is mandatory for all types of sub-projects to be implemented, whatever their nature;
- For subprojects in sensible areas, they are not eligible unless they successfully were subject to a EIE;
- Environmental assessment is needed for all types of subprojects by giving
 preeminence to the Code of water, sanitation and Hygiene, then to the Code of
 sanitation, safety and the working environment, particularly in terms of safety and
 security.

This list of pre-eminence arises from the degree of constraints and requirements of each legal framework.

ENVIRONMENTAL AND SOCIAL ASSESSMENT PROCESS

The environmental assessment process aims to ensure the consideration of socioenvironmental parameters during the implementation of sub-projects (micro-distillery unit and / or sugar cane production unit). This process is made up of 7 steps:

- 1 st step: Environmental screening of sub-projects;
- 2 nd step: Environmental categorization of sub- projects;
- 3 rd step: Environmental Studies of sub- projects;
- 4 th step: Examination and validation of study reports;
- 5 th step: Public consultation;
- 6 th step: Integration of measures in the environmental and social scope statements.
- 7 th step: Implementation, surveillance and monitoring.

1. ENVIRONMENTAL CATEGORIES OF SUBPROJECTS

The categorization of sub-projects will be carried out by the Project Coordination Unit. The categorization process should meet the requirements of the safeguard policies of the World Bank and the national regulations.

1. Requirements of the World Bank regarding environmental assessment

The Safeguard Policy on Environmental Assessment (OP 4.01) of the World Bank features three possible levels in the environmental assessment process, which are determined by the characteristics of the sub-project or project, its location, degree of sensitivity of its host environment, the scale of the impacts and changes expected to the natural and human environment. This assessment should be done early in the planning process and lead to a categorization into three levels. In addition to the previous sections (see p. <u>37</u>), there are three categories of environmental project or subproject of the World Bank.

• Category A: The Project / subproject is expected to cause significant impacts on the environmental, diverse, irreversible or unprecedented. Those effects can be felt in a wider areas beyond the sites or zones of installation of the distillery, distributors' stores and at consumers' houses. In this case, a detailed study including the analysis of variants such as the one without the sub- project is requested. This study must also lead to a series of measures to mitigate the identified impacts. This study, which takes the form of Environmental and Social Assessment Impact Assessment (EIES), including an Environmental and Social Management Plan (ESMP) should be

conducted by the developer of the subproject and can be published on the Infoshop of the World Bank.

• Category B: A Project / subproject is classified in category B if the negative effects is likely to harm human populations or larger portions of natural environment — wetlands, forests, meadows, and other natural habitats, etc. are less s than those of 'P roject / subproject Cat e gory A. These effects are of local level; few of them (if any) are irreversible. In this case, the study to be conducted consists of examining the negative and positive effects that could trigger the project / sub-project on the environment and to recommend any necessary measures to prevent, minimize, mitigate, or compensate the negative impacts and improve environmental performance. This type of study takes the form of a less thorough impact assessment than that of a project / subproject in category A, but requires an environmental and/ or social analysis with an ESMP.

In this case, it is possible to simply prepare an Environmental and Social Management Plan (ESMP) without an environmental and / or social analysis being required and that only standard mitigation measures are sufficient.

• Category C: a project / subproject falls in Category C if the probability of its negative environmental effects is judged minor or zero. Following a pre- environmental examination, no further environmental assessment is necessary for the project / subproject in Category C.

2. National requirements regarding environmental assessment

Nationwide, there are also three levels. The Environmental Impact Assessment (EIA) is a process similar to Category A (with EIA and ESMP) of the World Bank. The assessment of projects / sub-projects in this category is supported by the Ministry of Environment, through the ONE and the training of an assessment committee. In this case, the developer must contribute to the cost of the evaluation based on a schedule defined in the regulation.

The second level, the Environmental Commitment Program (PREE) which is of a similar complexity to category B of the World Bank in the event that the crafting of an ESMP is essentially requested. The environmental assessment of the PREE should be directly managed by the Project Coordination Unit.

The third level requires no need of a prior study which is equivalent to the Category C.

In all cases, the national legislation has the right to review the state's position if environmental or social problems are identified during the establishment or operation of the distillery unit.

3. Categorisation process

The sub-projects categorization process for the environmental assessment is applied in Category A, B and C of the World Bank on the following criteria:

Type and size of the project / sub-project;

- Location of project / sub-project;
- Sensitivity to challenges and environments;
- Nature of impacts / impacts expected;
- Intensity of the impacts.

As a matter of fact,

- If the subproject is located in sensitive areas according to the Malagasy legislation, it undergo an environmental impact assessment;
- If the subproject is located in the vicinity of a protected area, it must still undergo an environmental impact assessment;
- If the sub- project requires the displacement of the local people, the operational policy 4.12 s should be applied and a resettlement plan should be prepared even if the sub-project is not subject to an environmental assessment.

4. Triggering of safeguard policies

Alongside the sub-project categorization and the identification of the type of assessment to be conducted, the pre-environmental screening must also lead to the WB's safeguard policies, other than the OP 4.01 and OP 4.10 by the Project and subsequently, the other required documents (summary or full relocation plan), to comply with these policies. Thus, the safeguard policies of the World Bank that will be triggered by the Project for an eventual financial support of the sub-project are:

- OP 4.01 : Environmental Assessment ;
- OP 4.09 : Pesticide management ;
- OP 4.12: Involuntary displacement of people.

2. ENVIRONMENT SCREENING OF SUB- PROJECTS

The socio-environmental selection process or screening of sub-projects consists of determining, for each analyzed option:

- The nature of the sub- project and all the works related to it;
- The potential environmental and social issues;
- The type of public consultation to make;
- The types of safeguard policies of the World Bank applicable.

Since this Project is classified as Category B, the sub-projects relating thereto shall, in addition, be in the same category. Otherwise, they will not be eligible under the said project.

The presort (see Appendix 3. Form of environmental and social screening) allows identifying the eligibility of sub-projects to financing: the latter must be only in categories B or C (sub-projects in category A are ineligible).

An environmental screening sheet of sub-projects is given in Annex 3 of the CGES.

3. EXECUTION OF THE ENVIRONMENTAL STUDY

The implementation of an environmental study of a sub-project will depend on the categorization. For this, the adoption of this methodology for an environmental analysis of PREE type is required.

1. Responsibility

The execution of the PREE belongs to the sub-project developer. The PREE is submitted to the Project Coordination Unit, in collaboration with the World Bank.

2. Environmental Studies Schedule

The implementation of the EERP should be done in parallel as the technical feasibility studies or business plans of the sub-project. The results of the technical feasibility studies allow guiding the environmental study. Thus, the environmental costs should be considered in the business plan.

3. Objectives

The overall process of an environmental assessment aims to integrate environmental considerations into all sub-project implementation phases: design, implementation, operation. It helps the developer to design a project with more respect to its surrounding environment, while being technically and economically acceptable.

In practical terms, an environmental analysis projects the likely impacts of subprojects, identify ways to reduce acceptable impacts and presents forecasts and the most appropriate mitigation options. This type of study should also consult interested parties and the population concerned.

4. Results

The environmental study (PREE according the MECIE Decree or PGE for the Bank) is in the form of an environmental record that serves as the basis for obtaining the environmental approval (by ONE or the Project Coordination Unit). The presented recommendations must be integrated into the business plan.

According to the Annex C of the OP 4.01, a PGE or PREE should include the whole mitigation measures with regard to environmental impacts, environmental monitoring and institutional measures to be applied during the implementation and operation of a project in order to eliminate the negative effects of the said project on the environment and community, offset, or reduce them to acceptable levels. It also describes the necessary steps to undertake these measures.

For a sub-project in category B, which requires an environmental and social analysis, the PGE or PREE should include the following elements:

- Reminder of the regulatory, legal and administrative frameworks in which are required the environmental assessment e and the preparation of the study;
- Description of the project to be implemented;
- Data on the environment. Summary delimiting of the study zones and description of the physical, biologic and socio-economic conditions;
- Impact analysis on the environment. Estimated positive and negative effects of the project as much as possible in quantitative terms. Identification of mitigation measures and any potential residual effects;
- Environmental management plan that includes mitigation, correction, compensation measures along with the modalities of surveillance, monitoring and institutional reinforcement;
- This plan will also examine links with other mitigation plans of the project (examples : action plan of resettlement on natural habitats ...)
- Otherwise, a simplified analysis of risks and dangers can be required;
- Adaptation measures in climate change (possibly);
- Institutional aspects: estimation of role and the capacities of the environment services; responsibilities of the implementation of the mitigation measures; strengthening the scope of the environmental management of organizations in charge of the execution;
- Execution schedule and assessment of costs: execution schedule of measures to be taken as part of the project and costs estimate of investment and operation for nuisance mitigation, the surveillance and monitoring along with capacity building;
- Integration of the PGE in the project: inclusion of PGE in the planning, design, establishment of the budget and the execution of the project.

5. Methodology

The scope of the study will depend on the severity of the pollution, the vulnerability of components of the environment, nature and complexity of the sub-project, as well as information available on the implantation area. The document must include at least:

- A document certifying the legal status of the place 'implementation of the subproject;
- A description of the sub- project 'investment, including 'identification of possible variant;
- A description of the physical, biological, and human environment affected or may be affected by the subproject.

A comparison of the environmental variations of the subproject (if there is one);

- A forward-looking analysis of the possible effects of the variants retained on the environment;
- A plan of environmental management on the subproject;
- A summary.
- Public consultation

Public consultations are held throughout the environmental screening process, including the preparation of proposals for sub-projects that have impacts on the environment and the population.

The public consultation is to achieve the following (not exhaustive): display, dissemination of technical information on the sub-project, public consultation itself, integration of the concerns of the populations concerned and dissemination of the results of the public consultation.

Are among those that cater to public consultation: local elected officials, local residents, the relevant decentralized technical services.

7. Integration of environmental and social measures in the plan of business

We will ensure the integration of recommendations and other environmental and social management measures in the business plan of the sub-project. the cost elements associated environmental and social measures must be integrated into the estimated Retail.

The social aspects will be closely monitored in the integration of the business plan measures, with particular attention to the following points: (1) the participation of local populations, (2) social control, etc.

8. Getting œ piece - monitoring and environmental and social monitoring

The environmental and social monitoring shows whether the impact mitigation measures are effective and efficient; otherwise you have to see them again. This work will be provided by decentralized local authorities, decentralized technical services and people, under the coordination of the Project Coordination Unit. The monitoring report will be forwarded to the Project for arrangements.

C. CONSULTATION AND PUBLIC PARTICIPATION

Under the CGES development process and the CPO, consultation and public participation was conducted, so that people could be impacted by the project, targeted to participate in the planning and implementation Project work.

1. OBJECTIVE AND M ED METHODOLOGY

The objectives of public consultations (1) provide stakeholders directly concerned by the project fair and relevant information on the Project and the CGES, and (2) involve these stakeholders in the search for integration measures, reduction negative impacts for concerted and sustained implementation of the actions planned by the Project.

The consultations were conducted in three regions of Madagascar, with high potential for sugar cane plantation, namely Atsinanana Region, Region and Region Bongolava Analanjirofo.

In each region, the various participants in the consultations are composed of four main categories:

- Cane planters to sugar;
- Producers ' é ethanol ;
- Distributors ' é ethanol and focus to e ethanol;
- end consumers or users of the products.

Public consultation took the form of courtesy visits and information from officials at the area (Brickaville, Fénérive East, Tsiroanomandidy, Ranomafana East). Then, a series of community meetings with farmers' organizations took place.

The public was consulted in the drafting process of the CGES and CPO: These consultations should continue during the implementation of the ESMP and RAP.

The approach taken during the consultations was to:

- 1. pr é submit the project and its context, the activity e s s ' unites é production of ' é ethanol,
- 2. the activity é s cane plantations to sugar and the positive impacts and n e gatifs potential and e j to r é LIVE,
- 3. collect the views, the pr ed occupations and suggestions é set in the diff e ent interviews.

2. CONTENTS OF CONSULTATION AND PUBLIC PARTICIPATION

All stakeholders interviewed expressed their satisfaction with the nature of the Project and the environmental preservation goals, both in the natural environment and the socio-economic background. At the micro-distillery, the environmental impacts are currently insignificant given the quasi-isolation visited pilot unit.

However, concerns and suggestions were made by local actors and it relates more particularly to the impacts on the human environment and microeconomic impacts. Overall, currently already functional micro-distilleries are a major economic opportunity to seize for all categories of local actors of their settlement area.

It is important to note that none of the opposition project was recorded during the public consultation sessions be it for ethanol production plants, sugar cane plantations or at the distributor level. It is the same for the use of this fuel by households. Discussions with local communities and other stakeholders especially highlighted positive expectations about the project both on job creation as the use of the product itself.

Different actors are however unanimous on the existence of possible negative impacts of the project it is important to take and implement mitigation or avoidance measures. Below summarizes the opinion and the main suggestions during the consultations in the above three regions.

Table 5: Summary of opinions, views, concerns and recommendations by categories of actors

Categories of actors	Opinions, Viewpoints Concerns and fears	Recommendations
Manufacturer of ethanol / Micro-Distillery	State's position on the promotion of ethanol production activity in the country is not confirmed nor followed by specific actions	Relief certain procedures and tax relief to genuinely promote the ethanol production business
	Competition between ethanol manufacturers with local production of rum, risk limiting production for two players	Possible transformation of local rum into ethanol Formalization manufacturers local rum, once they begin to convert to the production of ethanol

	1 -	
	Awareness of environmental risks, particularly in terms of erosion and deforestation because of mining activity	Initiative to reforestation and soil stabilization activities in areas at risk and intervention MD Integration of coal in the ethanol sector
	Sabotage of fear and blows down other players and malicious competitors	Establishment of measures and solutions for the security of installations
Sugarcane growers	Fear of falling production and non-compliance with contracts with manufacturers, if ever there are disasters that occur	Setting up group structures of sugarcane growers and regulating
	Fear of falling production and non-compliance with contracts with manufacturers, if ever there are disasters that occur	Formalization of contracts and business partnerships between growers and cane producers. Implementation of identification cards planters Setting up group structures of sugarcane
	Fear of production risk of theft in the communities of the same producers	growers and regulating the Dina
	Stabilization and sustainable pattern of trade relations between the planters of cane and sugar cane producers	Development of a serious and lasting agreement, under the auspices of local authorities and support agencies on site
Sugarcane growers	Insufficient financial and technical resources to increase agricultural yields	Request for support and facilitation for access to credit / micro-credit, for example through the establishment of security deposit

	and the acquisition of agricultural inputs and equipment	
	required in the sugar sector	
Ethanol Distributors	Satisfaction for the existence of new products (household and fuel) Risk of accidents	Pending a possibility of arge dissemination and greater coverage of these products with a view to looking for economy of scale and stability and sustainability of their trade policy
	related to the use and handling of	Visible labeling and diagrammed, Malagasy and French
	liquid	The ethanol stove User Guide Editing in Malagasy and French languages
		Compliance measures and security standards
	Product storage Risks	Placing control system imposed by the Project and GD
		On this, compulsory registration of retail sales for better customer tracking
End users - users	Highly expressed fears of fire risk	Strengthen sensitization among users of the location of the liquid in the kitchen,
	Fear of swallowing the liquid by other people, especially children	Packaging suitable for the household: Containers 11, 1.5 liter and 5 liter
	Real perception of the economic benefits achieved by the household through the use of e ethanol, compared with gas and coal	commercial sustainability of expectation of the product on the market and the affordability for the middle class
	Real perception of the economic benefits achieved by the household through the use of	Maintain the subsidy on a more or less long term Support the production of ethanol, to its expanding
	e ethanol, compared with gas	Systematically ensure the sale close to

	and coal	consumers households
Local populations of micro-	Fears of	Lessen or avoid as much as possible,
distilleries and sugar cane	expropriation for	expropriation.
plantations	the land	
	requirements of	Consult those affected before the start
	micro-distillery	of work for possible negotiations
	activities and sugar	
	cane plantations	It joined one of the basic principles of
		the requirements of OP 4.12 for
		minimization of goods and / or sources
		of income affected.
	Interests of	Make the local recruitment
	beneficiaries during	
	project	The project should participate in
	implementation	rehabilitation or improvement of local
		socio-economic infrastructure (roads)
	Problems of waste	Strict implementation of measures p
	generated by	rotection of the environment, mitigation
	ethanol production	or avoidance of pollution
	facilities	
		Involving the community in
		environmental management

8. PLAN ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK

1. GOALS OF PGES

This chapter presents the major guidelines for Environmental and Social Management Project emerged from the priorities set out above and considering the safeguard policies of the requirements of the World Bank. The Plan for Environmental and Social Management or ESMP is a reference document to see the compliance of the project to produce ethanol compared with legal requirements, commitments and responsibilities as well as the policy developer in terms of environmental and social management. The guidelines also include guidance on optimizing the positive impacts and others relating to the prevention, mitigation and compensation of negative impacts. Indeed, the ESMP defines how, when, who, what, where and integrating environmental mitigation and monitoring measures throughout the implementation of a Project.

More specifically, it is:

 To ensure that the activities é s Project are undertaken in conformity é with all requirements l é gales sector and those of ed flowing MECIE the process;

- To ensure that Project environmental commitments are well understood by the staff of the 'factory and the subcontractors as planters of cane to sugar;
- To ensure that the Project has designed and realized to have better environmental performance.

The result of the analysis, that is to say the list of impacts and mitigation measures related to it must be defined in a coherent and comprehensible whole that allows the effectiveness of the reduction of impacts at throughout the Project. The ESMP must include among others, details of the mitigation measures to be implemented, the schedule for this implementation and those responsible for their implementation. The ESMP should also provide the control system which will be set up to ensure that measures are respected and the documentation process that allows reporting to various stakeholders.

The environmental and social impacts can be both positive and negative.

2. PROJECT EXPECTED POSITIVE IMPACTS

Positive impacts are generated by the four project components: sugar cane plantations, micro-distillery, resellers and distributors as well as households who use ethanol.

1. Cane to sugar

• Improvement in the incomes of cane growers to sugar

Note that the sugarcane sector has experienced major difficulties, given the decline of the sugar industry in Madagascar in recent years. Also, the project will give a new impet us to sugar cane growers and allow rapid and sustainable recovery in economic activity.

2. Micro-Distillery

Improvement of 'accessibility to the 'water for surrounding communities

Depending on the existing, it is conceivable that the distillery unit is made to build a water supply system, unique to it in the site. In case of AEP production is surplus to regular needs, there may be a possibility for the unit to provide an amount of water to surrounding users. The improvement of drinking water supply rate in the settlement area will therefore become a positive externality of the subproject.

Bagasse and vinasse, a biological fertilizer of choice

The bagasse and vinasse mixture with the chemical characteristics presented in the table below is an excellent organic fertilizer.

Table 6: Chemical characteristics of organic compost (+ Vinasse Bagasse)

chemical pH characteristics	organic carbon	total nitrogen	C/N
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Value / content	5.85	3.73%	0.38%	9.81
Feature	moderately acid	Very rich in organic carbon		The report 8 <c <12="" a="" matter<="" means="" n="" organic="" th="" well-decomposed=""></c>

However, it is important to see closely the soil acidic enriched by compost. Indeed, the vinasse is quite acidic (average pH 4.6). This imbalance favorable acidity alkalinity crops. Thus, on lateritic soils that are naturally acidic already, we must moderate the use of this compost as this would further increase their acidity.

Depending on the quality of social relations between the implementing partner and local people, ie sugar cane growers, they will benefit from the existence of bagasse and vinasse. Bagasse can be used for feeding livestock, while mixed with vinasse or not bagasse are highly effective organic fertilizers.

For reforestation needs wood and unites

Depending on the availability of land and operational feasibility, the subproject can implement a reforestation program in its area of intervention to offset the potential of wood energy requirements, the consumption is more modest compared with bagasse. The secondary objective of reforestation also includes the conservation of the natural environment.

Creating jobs and adding value on local economy

The main economic impact of a micro-distillery investment is creating jobs within its area of implantation. Note that a unit requires fifteen employees for proper operation. It goes without saying that this will generate added value in the local economy. While the number of jobs which are created is relatively small, it has given the size of the unit manufacturing ethanol. However, seasonal work in the sugar cane plantations could increase depending on the crop calendar.

Meanwhile, it is expected that these new jobs, the development of certain secondary activities in areas of the sub-project, such as small business, including trade in consumer products.

Cumulative positive impacts of creation of jobs on economy

This job creation is one of the main positive impacts. As a micro-distillery unit has about fifteen employees (if Ampasimpotsy), all fuel ethanol project that 100,000 beneficiary households easily generate hundreds of new jobs will therefore be distributed in all areas of intervention of the project.

Indeed, assuming that a household requires 1,5litre of ethanol per day and a micro-distillery unit produces daily average of 2000 liters, it will establish about 75 ethanol production facilities to meet the needs of 100,000 target households in the project. About 1,125 new jobs in addition to the newly created jobs related to other stages of the project from the production of sugar cane to the distribution and sale.

The existence of micro-distillery is obviously a boon for employees especially in these difficult times when the job search is often a real obstacle course. It is therefore a source of income more or less permanent for these families.

Improvement of municipal revenue and Fokontany through the fee

It is stipulated in the Act 2013-013 on the production and marketing of ethanol fuel (Article 11 / Chapter V°), the existence of discounts at the Fokontany and the Commune, from the activity on ethanol production. The establishment of this framework should be regulated by the Commune.

3. Resellers and Distributors of ethanol

The positive impacts on retailers and distributors are mainly related to job creation and the diversification of their activities. In the medium term, dealers expect a wider geographical coverage of sub-projects. In this way, dealers could achieve economies of scale, so the products would become more accessible to users, according to the gradual decline in prices on the market.

4. Medley

Reduction of defrichments for the forests and de forestation

The implementation of this fuel ethanol project also aims to reduce the use of other fuels such as firewood and charcoal. Key expected positive impacts of the Project are therefore included these reduction clearings especially in terms of natural forest areas.

At the household level, we have identified several advantages, if we made a quick assessment of the use of ethanol in comparison with other solid fuels. First, there is the absence of fouling, due to the absence of residues. In addition, ethanol is burned one of the least polluting gases (it releases 92% less carbon dioxide than gasoline). Given these characteristics, the use of fuel ethanol would reduce respiratory diseases in a household that usually consumes charcoal and firewood.

3. IMPACTS ON PROJECT GATIFS

1. Cane to sugar

Contamination' surface water by pesticides and pest

The increased use of pests and pesticides can cause potential negative impacts, both health and environment.

Loss of contents on micro organic to because of pesticides retained in the soil

It appears important to make an assessment of potential impacts on the soil at the planting area. Although treatments are applied to the aerial parts of the plants, part of the product always reaches the ground. And pesticides have harmful effects on the micro fauna and soil microflora, which agencies are essential to maintaining soil fertility (earthworms, bacteria, algae, fungi, insects and invertebrates, etc.).

Furthermore, a significant proportion of pesticides can persist in the soil, especially in the dry soil (the pesticide degradation rate generally increases with soil water content). In this case, rainwater or irrigation water may cause the dispersal of pesticides by runoff or leaching. Runoff contributes to pollution of surface waters, while leaching could contaminate the deep waters, according to the levels of pesticides in surface water content. In rural areas, surface waters are generally used for watering animals.

Risk of degradation of natural habitats

The search for new sugar cane fields can bring farmers clearing or deforestation. This impact is, however, considered low in magnitude as the cane fields must be located in the more or less irrigated plains, not river valleys and basins.

Risk of appropriation of an additional land to crops by the land clearance

It is not to avoid risks of clearing by farmers who want to acquire new cane fields. Indeed, the constant demand and possibly progressive sugarcane by MD arouses the interest of the farmers. They may be tempted to expand their production, by clearing forested areas. But deforestation is a highly unauthorized action or endorsed by the Project.

2. Micro-Distillery

• Risk depletion of water resources

The unit of ethanol production is a major consumer of water. Hence, the scarcity of water can be a major factor limiting the production of sugar cane and its processing into ethanol. The amount of water consumed to produce a liter of ethanol depends on the distillation technology. This consumption of water can vary from 2 liters to 10 liters of water per biofuel produced.

The production of ethanol thus affects the amount of water in the implantation site. It can lead to deprivation of water for water users and the surrounding population.

Pollution of surface water and groundwater by vinasses é pandues ground

Vinasse, which is the residue of the distillation, is a liquid whose alcohol content is nearly exhausted. However, vinasse has a strong polluting power. Given products used in the cane juice preparation phase before fermentation, its main composition consists of minerals which an undesirable element in water for consumption, namely nitrite. Pollution is also based on its high chemical oxygen demand (COD).

Chemical analysis of the vinasse micro pilot distillery reveals the absence of heavy metals (copper, zinc, cadmium), with the exception of a low manganese concentration. The following table provides an overview of the physical and chemical composition of vinasse.

	PO 4 ³⁻	NO 3	NO 2	Cu	mn	Zn	CD	BOD 5	COD		Cond.
	(mg / L)				(Mg / L)	(Mg / L)		(mg / LO ₂)	(mg / LO ₂)	рН	(Microseconds / cm)
Sample	0.19	<lmd< th=""><th>50</th><th><lmd< th=""><th>0.569</th><th><lmd< th=""><th><lmd< th=""><th>294.44</th><th>391.52</th><th>5.89</th><th>339</th></lmd<></th></lmd<></th></lmd<></th></lmd<>	50	<lmd< th=""><th>0.569</th><th><lmd< th=""><th><lmd< th=""><th>294.44</th><th>391.52</th><th>5.89</th><th>339</th></lmd<></th></lmd<></th></lmd<>	0.569	<lmd< th=""><th><lmd< th=""><th>294.44</th><th>391.52</th><th>5.89</th><th>339</th></lmd<></th></lmd<>	<lmd< th=""><th>294.44</th><th>391.52</th><th>5.89</th><th>339</th></lmd<>	294.44	391.52	5.89	339
discharge standards	10	20	0.2	-	5.0	0.5	0.02	50	150	6-9	200

Table 7: Physical and chemical characteristics of vinasse

Standards on liquid effluent discharges: Decree No. 2003/464 of 15/04/03; LMD: Limit of Detection

It is collected in a pit, the walls are not sealed or discharged without treatment in nature, vinasse seeps into the ground (even for waterlogged soil type low infiltration rate) and reach surface water or groundwater near the pit. A small amount of vinasse spread can also pollute surface waters downstream, even several kilometers from the place of discharge.

The most feared in water pollution impact is material contamination nitrite, as well as lower levels of oxygen in the water, the consumption of which can cause disease to humans, especially for kids.

Eutrophication of water

Particularly because of its high opacity blocking light rays and not allowing photosynthesis, vinasse causes eutrophication of waterways.

In the marine environment, even moderate nutrient enrichment, resulting in an increase in benthic primary and phytoplankton production: it can harm coral organisms indirectly: by the establishment of benthic algae, which colonize the corals and affect nutrition, growth and survival, and block light trapping sediment particles.

We observe exactly the same effects and impacts of eutrophication in inland waters, which tend to affect the population of fish and other aquatic organisms.

Risk of erosion due to the work of furnishings and land terracing

Generally, the Malagasy soil is degraded and there are many areas prone to erosion, due to climate that prevails in the area (ie wet and rainy areas) as well as deforestation. Even small land development work can cause erosions, whose severity can vary from one site to another.

As a result, you can save as a major impact of erosion, progressive and often rapid loss of productive land downstream of eroded points due to runoff. In addition to this, there will be a reduction in the long term production potential of these plots of crops. In the end, we are left with physical, biological and chemical degradation of surface horizons of cultivated soils.

Odors lead art in bagasse and vinasse

Very little alcohol residues that remain in the vinasse as a source of bad smell when it is directly released into the wild. Furthermore, bagasse left in the open air, and can be moistened and fermented by rain; also emit odors that affect air quality in the immediate area at the processing plant.

These odors affect both the staff of the micro-distillery that local residents.

Unsightly pile of bagasses

Bagasses not valued them more not managed properly can quickly become waste piling up day by day. Certainly, depending on the host environment of the sub-project, this accumulation can lure rodents and pests and insects. In rural areas, the field rats fleeing bushfires can easily reach the units that are located near the sugarcane plantations. While in suburban areas, the risk of infestation by rats are real, given the proliferation of illegal dumping sites.

This pollution may well threaten the health of workers in the micro distillery and the local populations.

• Rejection of carbon dioxide in the air from the boilers

Ethanol production through the use of boilers can impact on air quality. The smokes emitted into the atmosphere could increase the concentration of GHGs in CO2 emissions.

Defforestation and disturbance of natural habitats

As the technical process of ethanol production requires continuous consumption of significant amounts of energy wood. But as part of this project, micro-distilleries imperative to substitute 90% of the firewood (dried or fresh) by bagasse. A fuel consumption monitoring system required for distillation must be put in place to ensure that this impact is reduced to a minor level.

 Handling and inhalation are very frequent vapors ethanol and cane juice came up of cutaneous irritation and respiratory diseases

The direct and very frequent contact ethanol may have proven negative effects on workers' health. Indeed, it is recognized that inhalation of ethanol vapors and skin contact can be a source of local irritation. Also, the inhalation of much repeated ethanol vapors can cause pulmonary toxicity (periarticular disorders and chronic disorders of the lumbar spine). Eye contact with the product can also cause slight temporary eye irritation. By recognized scientific studies, ethanol may give degreasing effect on the skin, with a secondary inflammation Del Zoppo, Gianni (2003) 7.

Direct skin contact with hot liquid (high temperature sweet juices) can of course cause severe skin burns, for example during the breaking of an expansion joint that causes a jet of hot sweet juice.

• Inhalation of carbon dioxide from the boilers

The monitoring of the boiler must be done intermittently, to ensure that the distillation is well maintained. The staff in this charge is thus exposed to carbon dioxide and heat. This exposure would result in certain physiological ailments.

The proximity of the furnace heat can also cause headaches, sweating, tachycardia, and hypotension. Combined with the high outside temperatures, discomfort due to dehydration and circulatory disorders can occur. Beyond 25 °C, the discomfort is felt with, in addition, all the psychological consequences that it can have on precise movements, alertness and so security (decrease response capabilities, irritability, aggressiveness).

The additional monitoring methods recommended for boilers:

Thermal power boilers ≥3 MW <20 MW:

Annual test stack emissions: SO 2, NO x and particulate matter. Only NO x for boilers fueled by a gaseous fuel. The content of SO 2 can be calculated based on the certificate of quality fuel if no SO control equipment 2 are used.

If the annual testing of emissions from stacks deliver results consistently and Significantly better than the required levels (and if this trend continues), it is possible to reduce the frequency of these tests do not perform at intervals of 2 or 3 years.

Thermal power boilers MW ≥20 and <50 MW

Annual test stack emissions: SO 2, NO x and particulate matter. Only NO x for boilers fueled by a gas fuel. The content of SO 2 can be calculated based on the certificate of quality fuel if no SO control equipment 2 are used.

Emission Monitoring: SO 2 . Plants equipped with control devices levels of SO 2 : Monitoring Temporarly NO x: continuous monitoring of emissions or emissions indications based on the combustion parameters. PM: Continuous monitoring of particulate emissions, opacity or indications of emissions based on the combustion parameters or visual monitoring.

Storage packaging of ethanol

Ethanol belongs in the category of easily flammable liquids with a flash point in closed cup is 13 ° C. Vapors may form explosive mixtures with air within 3.3% to 19% by volume in the atmosphere. Strong oxidizers may react strongly with the product. Immediately, the ethanol storage conditions must be studied to avoid any risk of accident. Note that even if a closed

chamber (tanks, tank ...) containing ethanol may be submitted to the internal pressures strongly increasing with temperature.

Recommended methods to prevent and control emissions of VOCs (Volatile Organic Compounds due to leakage include, inter alia:

- -change Equipment (as indicated below)
- Particulate matter: The most commonly present in diffuse emissions are dust or particulate matter pollutants. These are released during certain operations, such as transportation and storage in the open air of solid materials. Recommended methods to prevent and control these emissions include the use of dust suppression techniques such as cover materials, water spray or increasing humidity in product inventory in the open and to make the spray water to reduce the loose material on paved and unpaved roads.
 - manual rations and risk sources accident

The risk of accidents to workers may occur during handling of materials within the distilling unit. The cleaning and maintenance operations, settings, startups are sources of major accidents. At the mill, it can result in cuts to hands, forearms lacerations or crushing during cleaning, for example:

• Increased prevalence of communicable diseases

The new entrants in a given area, whether rural or urban, can still be a potential niche disease transmission. The phenomenon should not be overlooked. The main vector is the massive and prolonged presence of masculine workers in a site, especially during the construction phase of the building of the unit.

Poor social relationships with the local community for non employment of the labor local piece

The relationship and proximity between the sub-project proponent and the local population is more subtle, when the sub-project is located in a sparsely populated area. Therefore, the non-consideration of the available local workforce can create frustration and disappointment among the inhabitants of the site. These could manifest indifference or rejection of much of sub-project at the site of the company, at the risk of incurring malicious acts.

Desagreements on hygiene to the public caused by pollution

The activities of the micro-distillery generate an increase in the amount of waste produced in the locality. The proximity of the waste and stagnant water, the houses nearby facilitates the proliferation of mosquitoes, malaria vectors. The lack of adequate treatment of industrial waste will have a significant impact on the unhealthiness of the site of the unit site.

Cane production shortfall in sugar

After those difficult years, we are currently witnessing a gradual recovery of the sugar industries in several regions of Madagascar. Therefore, the risk of insufficient cane production is likely. In this case, there will therefore be some competition between the sector of the production of ethanol and that of sugar manufacture. Accordingly, the inputs deficiency problem could reduce the production of ethanol, regardless of the capacity of distilleries.

local inflation

It is not to rule out the price increase of basic commodities as a result of the implementation of the distillery in a given area. Such a situation is generally likely when workers' incomes are much higher than those of villagers or local people.

3. Resellers and Distributors

The fire and explosion remain the main risk to dealers and users. These risks are even higher, depending on storage conditions and product packaging, whether packaged in bulk or small quantities.

4. Medley users of ethanol

It includes three types of risks associated with the use of domestic ethanol: (1) risk of burns, (2) fire and (3) risk of poisoning.

· Risk of burn

Being a highly flammable fuel, ethanol can still ignite even after several minutes off of the unit. It can cause severe burns when handling. Ethanol fumes can be released at room temperature and create a risk to the ignition and ignite the burner.

Risks of home fire

The flame ethanol is very light and difficult to control and can ignite very quickly flammable furniture items nearby. The fire then gaining momentum, reflecting warming fuel and apparatus that produces new vapor. Ethanol is a highly flammable liquid that can form explosive mixtures with air. Vapors can spread and cause a flashback. Its handling therefore presents a real danger to the user. It is important in the sense of working with ethanol away from sources of sparks or flames, what is considered unlikely in a Malagasy cuisine. Therefore, the risk of fire and explosion are real for user household.

Risk of poisoning

Swallowing the liquid is much more dangerous than inhaling steam or also contact with skin or eyes. The ethanol exposure by dermal and inhalation, even long term, is not a major health risk for humans. By cons, ethanol is neurotoxic; its consumption is acute or chronic

Beyond symptoms of transient impaired, ingestion however leads to a significant increase in the concentration of alcohol in the blood and may cause different types of disease, most of whom has acute and chronic effects. It cites, among others, intoxication, severe gastric damage, carcinogenic (by prolonged ingestion of ethanol in alcoholic beverages), abnormal reproductive (male infertility, disruption of menstrual cycles, etc.) <u>8</u>. Liver disease, cancers, nervous system disorders, fetal alcohol syndrome are the most serious diseases caused by excessive consumption of alcoholic beverages (INSERM, 2001).

4. Measures OF decreasement impacts on negative PROJECT

Compared to other major negative impacts of the project, as the dangers and risks of environmental, health and safety, mitigation measures are proposed for each project component when impacts are unavoidable, it is necessary to establish

Technical control and management devices to limit or minimize the likelihood and extent of any adverse consequence. Similarly, prepare workers and neighboring communities to enable them to deal with accidents.

8.4.1 Plantations of sugar cane

Acidification and changing the chemical composition of the soil resulting from the misuse of fertilizers may be limited by the recovery of vinasse and bagasse micro-distillery.

In addition, the local micro-economy can be influenced by the new direct and related activities that are deposited. The location of the distillery probably would encourage farmers in the area to engage more with the cane crops, the risk of abandoning other crops. Therefore, it is quite likely to encounter cases of cane overproduction, the distillery will absorb given its limited production capacity. This potential impact is even more plausible in areas of sugarcane dominance.

As a measure to take, should be initiated already some form of partnership between growers and the local cane rum manufacturer gasy. Such an arrangement, reciprocal advantage and secures both parties. However, it is not easy to establish lasting, so that participatory manner is necessary to study the formulas and arrangements that will result from the agreement.

As for the risks of clearing, due to new land acquisitions, it is recommended that: cane growers contenders, but the existence of cultivated land is not justified in any way, are not eligible by the Project. In other words, any grower of cane, supported by the project must prove by documents before the implementation of the Project, it was already a cane planter, and he ran a cane field. The location and characteristics (area) of its fields must be known. Without such information, the sub-project planting cane can not be eligible.

In all planting systems, the residues can be recycled to improve the real organic matter and soil structure, and to reduce soil loss. In addition to annual or intermittent residues, many plantation crops are also reflected by the main residues to the end of their commercial life. These residues are valuable sources of organic matter and carbon and can lead to prolonged release of nutrients during the development phase (growth) of the next crop cycle. Prevention strategies and control potential risks and impacts are:

- Develop and implement a waste management plan in combination with the results of research and planning nutrient management.
- Recycle residues and other matter organic leaving the materials on site or by composting (and distribution).
- Consider the possibility to shepherd and determined pests and diseases before setting a practice of this practice.
- Scatter (or mulch) large structures vegetative (for example, trunks, branches), at least as habitats and biodiversity benefits deniable identified s in the biodiversity management plan.
- Remember to use the residues culture to other purposes such benefits that feed, bedding, or chaumage-leaving the residues in the field is neither practical nor appropriate.

In cases where crop residues are higher than those required for the management of nutrients, consider using as a source of thermal energy for processing agricultural production or for the production of heat and / or power.

Non-agricultural waste from production systems (eg, pesticide containers, pesticide waste, and packaging) often have the potential to contribute to the adverse health, safety or environmental impacts. Considerations for the prevention and control of potential impacts of these wastes include:

- Ensure in all packaging of pesticides and herbicides are returned to the farm or forest after using correctly the stock to final disposal.
- Do not burn packaging, plastics, or other d e waste solids. Eliminate these waste in facilities of e elimination of d e waste d e sign e s or recycling.
- Examine a large container and / or systems my bulk for fuels, oils, fertilizers and chemicals to reduce the volume of containers to waste.
- Examine alternative product formulations and packaging (eg, a material biodimmable).
- Handle pesticides expired and indesirable waste hazardous accordance in the '
 Organization for Food and Agriculture (FAO) Guidelines for the management of small
 quantities of pesticides indesirables and expired.

Table 8: Mitigation of negative impacts related to sugar cane plantations

Negative impacts / Risks	Mitigation and prevention	officials	
		Application monitoring and control	Control / Monitoring
Soil acidification Changing the chemical	Limit the amount or fertilization dose crop fields,	Producer / manufacturer of	Town / STD

composition of the soil	the bagasse and vinasse mixture of acidic soils in humid regions Training farmers on how to produce cane sustainable, efficient and economical	ethanol farmer organizations / Local Communities CCM	
sugarcane overproduction unabsorbed by distilleries	sustainable partnership establishment between manufacturers		
	Formalization of contracts and business partnerships between growers and cane producers. Implementation of identification cards planters	Producer / manufacturer of ethanol	
	Development of a serious and lasting agreement, under the auspices of local authorities and support agencies on site		
Acquisition of new land by clearing	Ineligibility of new planters of cane, and those who do not operate cane fields before Project	Manufacturer / Producer	GD local communities
	Need to confirm the words of cane growers, with associations and local authorities and DRDR	Association /	DRDR

Regarding the measures concerning pesticide impacts, a document entitled "Pest Management Plan and Pesticides", is drawn parallel to the CGES to guide the implementation of the Madagascar Project Ethanol as domestic energy in accordance with the operational policy OP 4.09 World Bank.

Similarly, a document entitled "Population Resettlement Policy Framework or CPO" develops the activities to be undertaken in case of population resettlement.

1. Micro-Distillery

Measures attegation of negatives impacts

The rejection of the vinasse is harmful to the environment. It is mandatory to treat the stillage, as it is a hazardous liquid. Hence the interest in the valuation of bagasse and vinasse whose main routes are: (1) Recycling (anaerobic digestion of vinasse), (2) the release into the

wild after treatment, (3) use in crops.therefore, One of the greatest measures to the enhancement of concentrated vinasse as fertilizer, especially as the distillery is supposed to be located near the plantation areas. It is the same bagasse.

Vinasse remains after the distillation process must be stored in a sealed tank for drying. Distilleries have the capacity to produce more than 1,000 liters of ethanol per day, must have at least two pits. The pits should be covered and be designed so that rainwater does not seep it.

The micro-distillery may also sell dry waste from the production of ethanol as a bio-fertilizer to local sugarcane producers or other users.

The production of ethanol is a potentially risky activity, in the sense that the tasks related to the production process and its use potentially expose manufacturers, distributors and users. In terms of manufacturers, it is therefore important that the distillery undertake preventive actions against the risk of fire. As such, here are the steps to consider:

- Strengthening equipments to fight against the 'fire;
- Placing instructions SAFETY (indication and symbol);
- Bringing Personal protective equipment for workers.

In addition, it is recommended for the manufacturer to make regular deliveries with limited quantities from dealers, depending on the period and the stock to sell. This is to limit the quantity stored, which can be dangerous.

In general, the implementation of mitigation measures is the responsibility of the project proponent, as presented in the table below.

Table 9: Mitigation of negative impacts from the micro-distillery

		officials	
Negative impacts	Mitigation	Application monitoring and control	Control / Monitoring
organic wastewater contamination	Collect vinasse in a sealed pit walls		
Pollution of surface water by bagasse and vinasse Complexing of the surface water and groundwater Eutrophication of aquatic surface Pollution of the air / Bad smells	Dispose of waste by recycling them for organic amendment and for methane production (to be used for energy production) Re-use and recycling of water used (including those from	i tarmers organizations	Town / STD Body mandated by the Project Coordination Unit

septic tanks)		
Bagasse store in a dry place and away from moisture	Producer /	Town / STD Body mandated by the Project Coordination Unit

	dry bagasse as the lation fuels	
	ose fuels, fuels	
	materials use and	
	essing produce	
I I	ner emissions.	
cica	ici ciiiissioiis.	
The	ocation of	
	ting facilities	
	pared with other	
soui		
	d open burning to	
	are the soil,	
I I	rol weeds, and	
	narvest	
-	ments. Evaluate	
	rolled burning in	
	er generation	
I I	ties to extract	
	mal energy for	
	ficial use. When	
com	oustion is	
una	oidable, the	
pote	ntial impacts	
I I	ld be identified	
and	monitored the	
wea	her to plan the	
com	oustion in an	
effo	t to minimize	
imp	cts.	
Prof	ibit the burning of	
agri	ultural waste	
trea	ed with	
l ''	cides and	
	oducts (eg,	
I I	cide containers)	
I -	event	
	tentional releases	
I -	ersistent organic	
I I	itants (POPs)	
	itor and reduce	
amr	ionia emissions	

	le		
	from nitrogen		
	fertilizers and manure		
	use. Note that some		
	types of nitrogen		
	fertilizers have higher		
	ammonia emissions		
	associated with their		
	use than others.		
	Consider incorporating		
	fertilizer at planting to		
	minimize ammonia		
	emissions		
	Reduce fire risk by		
	reducing the		
	accumulation of		
	potential fuel sources		
	and control of weeds		
	and invasive species.		
	When residues of		
	controlled burns are		
	necessary to ensure		
	optimal conditions for		
	the low risk of		
	spreading and a low		
	impact on the quality		
	of the existing air		
	Building an		Town / STD
Depletion of water	autonomous supply	Producer / manufacturer	Body mandated
resources	system for drinking	of ethanol	by the Project
	water distillery		Coordination Unit
	1 1 1 1 1 1 1 1 1 1		

Erosion risk may be due to soil exposure to rain and wind during the clearing operations, earthworks and excavation.	Implement erosion control measures (biological or mechanical) to the level of risk Managing the flow of clean water: separation or diverting the flow of clean water with water at high solids content Installing proper road drainage depending on the width of the coating compaction and road maintenance.		Dirda (Regional Directorate of Agriculture) Municipality / Local Communities
Logging and deforestation	Make the most of dry bagasse as fuel for boilers Do not use firewood for a very limited amount at a rate of less than 5kg per day for a production of more than 1,000 Littre ethanol per day	Producer / manufacturer of ethanol	STD / Town
	Undertake a reforestation project Provide compensatory afforestation if deforestation	Producer / manufacturer of ethanol town	STD Body mandated by the Project Coordination Unit
Risk of fire and explosion on the distillery staff	Provide the equipment staff personal protection based on potential risks Have first aid equipment on site Properly ventilate the premises and install	Producer / manufacturer of ethanol Staff Unit	Body mandated by the Project Coordination Unit STD
	equipment against fire		

	in an adequate amount Design installations preventing the spread of fire from the distillery Train and inform staff about the risks and dangers of the products handled and the means used to reduce risk		
Fire and explosion hazards for the neighborhood	Store ethanol in tightly closed containers, stored either in the open or in specific premises, equipped with general ventilation and away from sources of ignition and heat Put storage places of sumps	Producer / manufacturer of ethanol	Body mandated by the Project Coordination Unit STD
Increase of communicable diseases in the implantation location of the subproject	Educate workers and local residents on STIs and unwanted pregnancies Train health professionals on the treatment of diseases Immunization campaigns for workers in local communities	Producer / manufacturer of ethanol	Body mandated by the Project Coordination Unit STD
Disruption of the social environment / risk of frustration when not using the local workforce	Favoring local hiring Keep a good neighborhood relationship Conduct information meetings and awareness of local populations	Producer / manufacturer of ethanol	common

			, , , , , , , , , , , , , , , , , , ,
noise / visual and olfactory Pollution felt by local residents	Avoid burning solids in the open	Producer / manufacturer of ethanol	Common / STD

• Guidelines during the identification of the site of 'implantation of micro-distillery

The implementation of a sub-project in urban or peri-urban areas is hardly prohibited by law. The Project only regulatory framework promotes the implementation of the sub-project in rural areas in order to optimize the microeconomic development and the impact on rural areas.

The following guidelines are established when the subproject is to locate in urban areas. First, some areas are avoided, such as:

- Areas residential area or a non-compatible with the 'activity industrial, so the Commune implementation has furnished or 'a plan 'town planning;
- Zones to risk areas such as flood s or poorly drain, land on steep slopes.

By cons, we will favor sites following characteristics:

- Place in proximity amount of fire ora piece of surface water;
- Location viabilised by bucket electricity water and 'sanitation;
- Location accessible by car, allowing circulatieone of the great vehicles.

Rural, natural environments are more susceptible to the destructive activities of the unit distillery it appropriate to introduce a number of specific directives, such as:

- Avoid proximity of the following sensitive areas: protected area for flood plain or poorly drain, for primary natural or secondary forest wetlands. Protecting areas on steep slopes, in border the plains or vast areas of crops
- Avoid population concentration areas or activities which are not compatible with the distillery producing
 - Give advantages for the areas with facilitating access of water resources in large quantities.

• Give advantages for the areas with a wide space between the zones 'activities human (local residents) and 'unites production. This is to handle adequately and durably solid waste and water used are produced by unites.

Biodiversity and Ecosystems

Perennial agricultural production has the potential to have a direct and indirect impact on biodiversity and ecosystems. Key direct impacts related to habitat conversion or degradation, water use, pollution, invasive species, inappropriate farming techniques, and the quality or availability of ecosystem services priority. Indirect impacts are related to migration, and induce changes access to traditional land use (including hunting, fishing and recreation). Impacts and related mitigation activities related to biodiversity and ecosystems are mainly crop specific, technical, and context of the use of existing land at a specific site.

The impact avoidance should be the goal. The selection of appropriate sites, including the planning of the expansion, is the only measure the most important impact avoidance at the disposal of the production of plantation crops.

It can improve the choice of macro-level project site to avoid selecting areas with high biodiversity values, such as essential or natural habitats of high conservation value areas (HCV), modified habitats that contain the value of biodiversity important (as previously abandoned farmland that was later developed in secondary forest), or ecosystem services provisioning or regulation. Screening should be conducted to identify species and sites importance in the region or of a wider landscape. Tools such as the evaluation of integrated biodiversity Tool (IBAT), can facilitate access to key international data sets, as well as known and unique gregarious sites. Screening should review all existing spatial data and mapping the landscape as part of the documentation review and analysis office. The main sources of biodiversity or ecosystem information include strategic environmental assessments (SEA), national biodiversity strategies and action plans (NBSAP), the relevant sectoral plans (including those who may be affected, as eco-tourism or fishing), and conservation plans.

Conversion, natural habitats or HCV existing critical in agriculture should be avoided whenever possible and planting on degraded land or modified habitats should be encouraged. This should be informed by an assessment of existing habitats altered or degraded land suitable for agricultural production or catering, to reduce the risks and costs associated with impacts on biodiversity and the reduction of ecosystem services.

Construction guidelines of unites production

During the construction phase, the following general guidelines should be applied by the promoter:

- Follow the norms and existing technical standards s in the matter re reconstruction of one unitdistillery despite its scale;
- Reinforce Installation sanitary infrastructure for the needs of staff and visitors;
- Enough reinforcement of the entrance and access for heavy moving vehicles;
- Providing the sufficient drinking water for the unit
- Reinforcing drainage based on the level of Pluviom e sorts the site;

- ensure that the construction is wearing effects of climate according to the site exposure to climate risks (hurricanes and flooding)
- Protect the ground to avoid risks and problems of erosion
- Install signs to road network
- Handle as much as possible the waste site during the actual construction to limit the environmental and social disruption;
- Monitoring the establishment on the totality the properties.
- Directives exploitation of unites production

A number of provisions must be complied with by the operator of the distillery, as listed below (without being exhaustive):

- Train workers regurarly on the instructions of SAFETY and instructions exploitation;
- Control systematically temp ed temperature in the storage place of ethanol;
- Maintain and ensure the proper functioning of all e equipments and facilities to ensure the s e SAFETY, the amenagements anti-erosion, works of 'sanitation and bucket' drinking water;
- Handle properly the wastes and effluents unites, depending on their characteristics depending on environmental technical requirements;
- Limit production of waste;
- Inform and precome in all circumstances STD or organizations concerned throughout the 'exploitation;
- Apply and ensure to enforce the necessary guidance and recommendations of the concerned sectors of technical services by the 'activity.

Hygiene and Safety

Employers and supervisors are required to take all reasonable precautions to ensure the health protection and safety of workers. This section provides guidance and examples of reasonable care in relation to the management of key risks to health and safety at work.

- Integrity of structures on the workplace: the workplace designed and equipped for the protection of the health and safety of workers
- Workplace and output: the space for each worker, and all the premises should be adequate for the performance of all activities. Similarly, the passageways leading to emergency exits must be clear at all times. Emergency exits must be clearly visible even in total darkness.
- Precautions against fire: bring the manual equipment installations for the fight Against fire, both easily accessible and simple to use. We must also equip local fire and alarm systems both audible and visible.
- Toilets: There should be some number of toilets (toilets and washing areas) sufficient for the number of people working in the facility, and the separation male / female and indicators "free / busy".
- Supply of drinking water: It must provide a supply of drinking water to appropriate volume provided by a vertical jet fountain or other medical device for collecting water for drinking

- Lighting: to the extent possible, workplaces must be illuminated with natural light, supplemented by artificial lighting to promote the health and safety of workers and enabling the safe use of equipment. In addition, emergency lighting, appropriate intensity, must be installed and fire automatically in case of failure of the main artificial lighting source
- First aid: the employer must provide for the presence of constantly qualified first aid services. In remote stations must set up emergency procedures for cases of trauma or serious illnesses, until the victim is transferred to a suitable medical center.
- Air supply: There shall be provided a sufficient supply of fresh air in workrooms inside and restricted places. Among the factors to be taken into account in the design of ventilation, we show physical activities, substances used, and emissions from treatment.
- .Ressources for emergencies
- Finance and Relief Fund: It is necessary to provide a mechanism to fund relief activities.
- Contact List: The Company must draw up a list of contacts for all internal and external resources and staff. This list must include: name, description, location and contact information (phone, email) for each service, and be updated annually.

2. Resellers and distributors ethanol

For the professional distributor, the minimum requirements are:

- Designing construction fund or storage area according to existing technical standards
 ;
- Of course SECURING the storage area (for the 'installation of signs and indications, etc.)
- Educate and train staff about the potential risks (interested in the use of equipments and extinction, exercises evacuation, etc.)
- Equiping bottles and cans devices SAFETY to limit certain risks in their use (anti device overflow, indicating the volume to them, etc.)
- Register on ' packaging a number of pr e guarantors of 'fuel usage such as :
 - Do not use other than the fuel use
 - Respect the time to wait before refilling hot equipment
 - Do not use pumps electrical
 - Etc.

Table 10: Mitigation of negative impacts compared to the retailers and distributors of ethanol

		officials		
Negative impacts	Mitigation and prevention	Application Control / Monitoring		
Fire and explosion at	Make regular supplies	Producer / manufacturer of	Body mandated by the Project	

distributors	Authorized Resellers	ethanol	Coordination Unit
	Limit unit packaging quantity	LPIP	STD
	Securing packaging and packaging (labeling and sealing)		

3. Medley users ethanol

Concerning users of fuel ethanol and resellers, mention the following measures:

- Limit the packaging of a maximum of 20 liters fuel canister at the 'end user. Storage of a large quantity ethanol within 'a m é nage is a factor 'increased risks of 'fire and burns during handling;
- Train users to reassure the 'employment in the home and in the fuel;
- Etc.

Table 11: Mitigation of negative impacts in relation to users of ethanol households

		offi	cials
Negative impacts	Mitigation and prevention	Application monitoring and control	Control / Monitoring
Fire hazards for the user of fuel	Limit the unit quantity of packaging, that is to say, use of storage containers and 1l 1.5 and up to 5 liters. Limit the amount of stock at the distributor Securing packaging and packaging Consumer information on risks consumer capacity building on many topics related to precautions for the home and fuel	LPIP / Manufacturer / Dealer / household user	Body mandated by the Project Coordination Unit STD

5. ENVIRONMENTAL AND SOCIAL MONITORING PROGRAM

This section presents the methodology for integrating environmental and social component and to ensure ownership of the project ESMP. With such an approach, effective and operationally so we can verify that the Project produces little negative impact on the environmental and social backgrounds. This environmental monitoring is particularly important that it will confirm the impact hypothesis.

1. Environmental monitoring of the goal

He improves project design and adjusts future environmental assessment based on observed real impacts. It also allows the project to measure the performance of its mitigation and enhancement of its environmental policy and its environmental activities in general and change.

Specifically, environmental monitoring must have as main objectives:

- VERIFY previsions impacts (apprehended / real impacts);
- ensure Highlights Benefits are positive maximize
- Validate the efficiency measures attegation and correct or achievement of complements research if necessary.

Environmental monitoring will be conducted mainly at the distillery and sugar cane production, otherwise locally.

2. Responsibility monitoring

Implementation responsibilities are aimed primarily at producing ethanol. More specifically, it is responsible for compliance with technical specifications for integrating the environmental dimension of all activities of his unit. For cons, the overall supervision of the monitoring is ensured by jointly Coordination Unit with the NEB.

3. Methodology

Environmental monitoring addresses four areas:

- An evaluation of environmental impact of sub-projects and the effectiveness measures taken
- A warning negative changes of environment consulting from the exploitation of unites and cane production in sugar
- Doing evaluation or estimate of all impacts on increasing Print in terms of environment
- Reoriontation measures and implementation of piece plans emergency if necessary.

The following questions are to be considered in the environmental monitoring:

• Is the sub-project complies with the description established for lacquered it the environmental permit has delivered?

- All components and activities in are subproject included in the environmental monitoring?
- The measures applied é are they're consistent with the ESMP?
- All important possible impacts they are taken into account by tracking?

4. Indicators monitoring goal

Monitoring indicators provide quantitative and qualitative information on the impacts and environmental and social benefits of the Project. To this end, it is proposed generic indicators below:

- Indicators order strategic
- Percentage of sub-projects that have the environmental screening object
- Percentange the session of training / awareness organized
- Percentage of monitoring missions / environmental assessment
- Process indicators and indicators of results
- Subproject percentages having been the subject as election environmental and social
- Subproject percentages having been the subject EIA or EERP with PGES piece
- Percentage of producers ethanol have trained in environmental and social management
- Percentage of workers have trained environmental and social management;
- Cane growers percentage in sugar have environmental and social management
- Percentage of jobs created locally
- Number of occupational accidents related to risk activity

6. Institutional mechanism for setting a piece ESMP

The environmental and social sustainability of projects funded by the World Bank and involving smaller subprojects, based on the capacity of sugarcane growers, producers of ethanol, resellers of the products, and local authorities the location area of the subproject, to ensure properly the environmental and social management. Consequently, it is essential to ensure that capacity that the Project allocates adequate resources for training, capacity building and technical assistance to start the project.

1. Organization and responsibility locally

The environmental and social management of the sub-project is provided by the following entities:

• The Technical Services Decentralized or STD is in charge of the control the EERP and the send for approval to the United Coordination Project

- United Project Coordination charge the elaboration of the EERP, to monitor the implementation of piece CGES and establishing the monitoring report
- The local authority is contributing to the awareness of cane growers and the local population and to the application of CGES.

2. Organization and responsibility at the headquarters

At the central level, the structures are identified to ensure the proper conduct of the environmental and social management of the project process. It's about :

• United for Project Coordination

The coordination unit would be the Green Developement.

This unit role is to coordinate the joint activities of all stakeholders, both centrally and locally. Specifically, it is essential to put in place a structure or a cell responsible for the integration of the environmental dimension within the unit, whose main activities are:

- Conduct of the public consultation process and publication of EERP and ESMP of each sub-project;
- Realization of check list of environmental measures
- environmental organisation subprojects based on results of screening and election environmental and social;
- Development of indicators monitoring and environmental and social monitoring of sub-projects;
- Followed vironnemental subprojects;
- Organization of capacity building workshops central and local actors;
- Elaboration report periodical on the environmental aspects and social Project with the World Bank.

National Agency for the 'Environment (ONE)

ONE is the technical structure of the Ministry of Environment in charge of environmental assessments of development projects in Madagascar. In the case of EERP, the ONE accompanies the Coordination Unit and the Promoter or the manufacturer for ethanol:

- The scattered environmental organization subprojects;
- Validation reports environmental and social study;
- Monitoring and environmental monitoring of sub-projects;
- Strengthening the local capacity stakeholders on environmental and social dimension of sub-projects.

9. IMPLEMENTATION SCHEDULE OF PIECE AND ESTIMATED BUDGET CGES

The following are the major activities to be performed by the Project as part of the implementation of the ESMF. To clarify that the specific actions related to the production of ethanol or sugar cane plantation will fall directly to the producer (promoter) and planters. In this sense, it is not necessary to make a cost estimate.

Therefore, the sections to budget and plan for implementing the ESMF include the following positions:

- Reduction and optimization measures (concerning the actual project)
- Potential strengthening capacity.
- The follow-up and environmental monitoring of sub-projects
- A provision for environmental emergencies and social.

The provisional schedule implementation CGES is as follows:

Period Measures **Proposed actions** 1 year year 2 year 3 year 4 year 5 Mitigation and (List of measures for a optimization project) measures **Upgrading actors** Information and Measures to Awareness strengthen capacity Technical assistance Environmental Surveillance and Follow-up measures Monitoring Evaluation

Table 12: Implementation Calendar CGES

Monitoring begins at sub-project design phase and continues throughout the duration of the unit's construction, and the duration of the operation (usually long). The Project Coordination Unit tour schedule is as follows:

- Regularly Visits whose frequency hang of the extent of environmental impacts;
- Visits unexpected when there may be environmental problems

Table of simplified preliminary budget is as the following table shows the:

Table 13: Budget for the implementation of the ESMF

Measures	proposed actions and activities	Elements of cost	Estimated cost in ariary
mitigation and optimization measures	awareness campaign	Package 1,000,000 ariary per site (at 50 locations)	55,000,000
Measures to strengthen	information officials at	Package 1,000,000 ariary per workshop (at 3 workshops)	3,000,000
capacity	Training of local actors	Package of 10 million ariary per workshop (at 5 workshops)	50,000,000
Follow-up measures	monitoring and environmental and	Package 2,000,000 ariary by monitoring mission (with 10 missions)	20,000,000
7071	iProvisions (*)	Package of 20 million ariary	20,000,000
TOTAL			1 43,000,000

(*) The expenditure eligible for the provision of section include (1) the costs incurred during any environmental assessment missions ONE and payment of expenses caused by accidents on the donation environment project and not promoter of the subproject.

The amount deemed necessary for the implementation of the ESMP is thus 143 million ariary.

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10. CONCLUSION

The issue of fuel ethanol project is manifold: economic, ecological, social, local, regional and national. Therefore, the Project implementation is a major challenge for Madagascar for the environmental sector and for the industrial sector: the challenge of sustainable preservation of tropical forests, the challenge to reduce the mortality rate due to the use of coal, the challenge of promoting the cane sector, finally the challenge of reducing rural poverty.

It must be said that the concept of micro-distillery ethanol is very innovative; therefore it is likely that the use of fuel will not be initially available for Malagasy households without external support. It is in this context comes this Ethanol Project, with subsidies for the purchase of fuel fireplaces.

Like the projects supported by the World Bank, the development of an Environmental and Social Management Framework is an essential step imposed by the Operational Policies, precisely with the aim of ensuring good environmental integration and social Project. The CGES including ESMP (part of the document), sets out the measures to be considered for this.

Implementation of the recommendations published in the ESMP she will thus reduce potential negative impacts and environmental problems that can cause the production, distribution and handling of product ethanol. It is the same agricultural practices in sugarcane plantations.

In addition, the following recommendations are necessary among others, before determining the site of a sub-project:

- Enforce implementation of piece attegation recommended
- Organize regularly environmental monitoring missions, with the actors of other sectors concerned activities by the Project;
- Respect the technical standards in the matter reconstruction (avoid the risk of fire and explosion).

Finally, for better adhesion of the subproject, despite the private nature of the activity, one has to realize awareness campaigns, information and communication, from the planning phase to the full operation of the unit. Also, the CGES has planned such activities repeatedly.

In conclusion, the CGES is a reference for any subproject distillery, ethanol fuel producer in Madagascar. It is used to orient the first promoter of the sub-project, the Project will, to the best way to manage the fuel-related activities, while thinking about the environment.

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APPENDIX

Appendix 1. Terms of Reference Model for preparing an EMP

2. Schedule environmental and social screening form

Introduction:

This first section of the TdR indicates the purpose of the terms of reference, identifies the promoter of the subproject, briefly describes the sub-project to assess and present arrangements at this stage for the preparation of an environmental management plan (EMP), such as a tender.

Contexte:

This section explains the institutional, geographical, environmental, social and economic context in which the subproject is subscribed. In addition, it provides relevant information on the objectives and components of the subproject, as well as on the study area, so that anyone interested in the project can understand well the situation and the constraints surrounding the subproject and the study to achieve.

This section must also mention any source of information that could be useful for the conduct of the study.

Requirements:

This section identifies the policies and guidelines that should be followed during the conduct of the study. Among other things, these may include:

- -The World Bank safeguard policies
- -Guidelines on environment and social of the World Bank (Environmental Assessment Sourcebook and Updates, Pollution Prevention and Abatment Handbook, documents relating to the social aspects such as involuntary resettlement, etc.)
- -The MECIE Decree
- -The sectoral directives of ONE.
- -Environmental and social conventions ratified by Madagascar
- -Other relevant documents.

Objectives and scope of the study:

This section defines the objectives of the study and summarizes the scope of the work to be done, indicating the main tasks to be done during the study. The scope and level of effort required for the preparation of the study must be proportional to the potential impact of the subproject. For example, a study for a subproject that would have negative impacts on the social components but little impact at the biophysical level should mainly focus on the affected social components.

The main tasks that should appear in this section of TdR because of their importance include:

- -Describe the subproject proposed providing a synthetic description of the relevant components of the subproject and presenting plans, maps, figures and tables.
- -Identify the political, legal and administrative framework in wgich the subproject is subscribed.
- -Take into account regional or urban planning concerned, the consistency of the subproject with these plans and that if no schedule is available, consider the aspects related to planning to assess the viability of the subproject.
- -Define and justify the study area of the subproject for the assessment of the environmental and social impacts.
- -Describe the conditions of physical, biological and human of the study area circles before the execution of the project. To do this, the TdR should indicate the aspects to be the subject of a literature review and those for which the data are to collect the field and/or model.
- -Identify appropriate mitigation and measures as well as bonus aiming to prevent, minimize, mitigate or compensate negative impacts or increase the environmental and social benefits of the project, including the responsibilities and the associated costs.
- -Develop an environmental and social follow-up program, including indicators, institutional responsibilities and the associated costs.
- -If necessary, prepare a Management Plan for the risk of accidents, identification of appropriate security measures and the development of an emergency plan.
- -Identify the institutional responsibilities and capacity-building needs, if necessary, in order to implement the recommendations of the environmental and social assessment.
- -Conduct consultations with stakeholders to determine their views and their concerns about the project.
- -Preparing the final report in accordance with the content type in the CGES.
- -Prepare an environmental management Plan (EMP) in accordance with the content type in the CGES.

Based on triggered safeguard policies, prepare other Plans (example: involuntary resettlement Plan)

Schedule:

This section specifies the deadlines to deliver the PGE, as well as any other events and important dates. The timeline should be realistic in order to allow the preparation of the report within the specified deadline.

Consultant's profile:

This section identifies the types of expertise required to carry out the study and, if possible, the level of effort estimated for each expert. A multidisciplinary team, including experts in the environmental and social fields must be promoted. The expertise requirements must be defined as precisely as possible in order to ensure that key issues related to the assessment of the project are treated by appropriate specialists.

Annex 2. Environmental and social clauses to be added to the DAO

A bidding project folder supported by the Bank includes several items. Environmental aspects will be inserted into the following components:

Book of particular administrative Clauses

The General obligations of the investor in environmental and social matters are mentioned.

Technical specifications and Plans

It is the part of DAO where there are environmental and social clauses.

These clauses are intended to help the people in charge of the drafting of the documents for the bidding of the project Ethanol as domestic fuel.

1 GENERAL CLAUSES

I.1 respecting the national laws and regulations

The investor must conform to national regulations and legal related to environmental and social management and the requirements of the World Bank safeguard policies.

He will also have to comply with national and municipal regulations governing the environment, public health and safety.

Thus, for a better consideration of the environment in all phases of the project activity, the following social and environmental requirements should apply in the implementation of the Ethanol project as domestic fuel .

In this context, the investor agrees to respect all environmental and social clauses described below.

I.2 permit and various permissions

The investor must obtain all permits and sectoral permissions before starting activities (ex: environmental permit from the Department in charge of energy)

1.3. Activities kick off meeting, informing of local communities

Before the start of activities, the investor must organize meetings with local authorities, representatives of local communities, informing them about the project: consistency of work and activities, their duration, environmental and social issues, the code of conduct of the workers likely to be affected.

I.4 Environmental officer

Implementing social and effective execution of the environmental management plan, the entrepreneur needs to recruit a responsible on environmental and Social issues.

I.5 environmental Engagement program

As part of the construction of the micro-distillery and before the start of construction, the investor shall establish and submit to the supervisor for approval a detailed program of environmental and social management of the site which includes all environmental and social measures and the program of implementation of these measures (including the rehabilitation of the sites at the end of the work) that it intends to implement in order to ensure the protection of the environment of the site. It will thus integrate the costs and corresponding deadlines in its offer.

I.6. Easements, release of control, cas of transport and distribution lines

The investor must inform the population concerned before any passage through the fields. The release of control and the easement must be according to a schedule defined in agreement with the affected population and the contracting authority. Before the installation and the start of the work, the investor must ensure the effective payment of compensation/indemnities to the right holders by the employer.

II. Installation and operation of the subproject

II.1 Social integration

- (a) Ensure the maintenance of a good working relationship and of coexistence with the local population.
- (b) Respect the Customs and traditions as well as the social area rules.
- (c) Prioritize the recruitment of local workers in the area where the work is carried out.
- (d) Develop rules of procedure and apply the penalty procedure or sanction in case of deficiencies identified in that whatsoever.
- (e) Respect the working hours in order to minimize the disruption caused to surrounding populations, especially with respect to noisy work. Any exceptions will be subject to the prior approval of the local authorities.
- (f) Take into account any relevant, written or verbal, grievance of the riparian population: establish a solution of agreement and take measures to solve the problems.
- (g) Install the barracks of site (as appropriate) as far as possible of houses and in an authorized place.
- (h) To design and implement a jobsite organization framework
- (i) Avoid the obstacles to traffic. As necessary, provide for deviations.

II.2 Health, safety and environment

- (a) During the construction phase of the unit, regulate and set the speed of vehicles and machinery to avoid the risk of accident, especially in urban areas, set up signs and speed limits as well as some construction signs that meet the laws and regulations in force, apply the code of good conduct on transport and traffic machines.
- (b) Make available to the site temporary latrines.
- (c) Put at the disposal of the workers drinking water.
- (d) To sensitize workers on combating and prevention of venerial desease and HIV/AIDS. For this, a program of prevention and fight against AIDS. Putting free condoms available to all employees.
- (e) Respect the working hours in order to minimize the disruption caused to surrounding populations, especially with respect to noisy work. Any exceptions will be subject to the prior approval of the local authorities.

- (f) take into account any relevant, written or verbal, grievance of the local population: establish a solution of agreement and take measures to solve the problems.
- (g) install the barracks of site (as appropriate) as far as possible of houses and in an authorized place.
- (h) to design and implement a blueprint for construction site
- (i) avoid the obstacles to traffic. As necessary, provide for deviations.

II.3 Waste management

- (a) Solid waste sorting procedure. To do this, put at the disposal of the site, waste collection devices and separate biodegradable and non-biodegradable waste. Eliminate them in authorized areas.
- (b) Do not deposit special waste from unity in the sites of communal discharge (not designed to receive such residual materials)
- (c) Store appropriate vinasses and bagasses of the pressing of sugarcane and the distillation of alcohol in places or features and try to give them more value (ex: use of distilleris and bagasses as organic amendments...)
- (d) Control the placement of all waste

II.4 management of nuisances (noise and dust)

- (a) During the construction phase of the unity, maintain equipment in good working order.
- (b) Cover with tarpaulin the trucks transporting brittle or powdery materials.
- (c) Limit the speed of vehicles traffic at 10km per hour to the passages through residential areas.
- (d) To the extent possible, to ensure that the noise produced by machines and equipment or a maximum of 75 decibels for a less exposure time of 8 hours.
- (e) Take steps to minimize disruptions due to vibration or noise coming from the ethanol production and construction activities.

II.5 Pesticides management

- (a) Restrict the use of pesticides in prescribed doses at least following what is announced in the notice
- (b) Provide protective gear in the handling, use and storage of pesticides
- (c) Observe the practices of pesticide use
- (d) Respecting management of empty packages

II.6 Control over erosion

- (a) Limit the excavation work inside the area required for the implementation of the unit
- (b) Treat all existing gullying that threatens a considered site
- (c) Provide anti-erosion control if necessary

Annex 3. Environmental and social selection form

This selection form has been designed to assist in the initial selection of sub-projects to be implemented on the ground.

PART A: Brief description of the subproject
Name of the project :
Deputy Project Name:
Sub-Project Location: Location of the subproject:
fokontany:
commune:
district:
Region:

Field information: Soil:

Land profile: Legal status:

Current occupation of the land:

area available:

Conclusion on the field:

Part B: Brief description of the environmental situation and identification of environmental and social impacts

Problems related to sub project

No S	Problems	Yes	No	Obs.
Α	Zoning and Planning			
	reached zoning and land use or there between he door subproject contradict tenure systems in general?			
	The sub-project he involves significant overhaul land or site remediation?			
	He will be the sub-project subject to a potential invasion of urban use or on an area to an urban or industrial development?			
В	Infrastructure and Facilities			
4	The sub-project does require the establishment of additional production facilities?			

5	The sub-project it requires significant levels infrastructure or community facilities to be used to support workforces during construction (eg the contractor will he need more than 20 workers?		
С	Contamination of Water and Soil		
6	Is there a possibility that, due to the implementation and commissioning of infrastructure, ecology of rivers and lakes will be adversely affected?		
7	The subproject he generates a massive amount of residual waste, construction waste materials or he promotes soil erosion?		
8	The sub-project does require the use of chemicals or solvents?		
9	The sub-project leads it to the immediate destruction of vegetation and soil in the hold, borrow pits, landfills and construction equipment?		
10	The sub-project he leads the stagnant water formation in the borrow pits, quarries etc., an environment conducive to the breeding of mosquitoes and other disease vectors place?		
D	Noise and Air Pollution, Toxic Substances		
11	The subproject it increases the level of harmful air emissions?		
12	The subproject he strengthens the ambient noise level?		
13	The sub-project he involves the storage, processing or transport of toxic substances?		
Е	Fauna and Flora		
14	The subproject he tends to disrupt or change existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes)?		
15	The subproject he causes destruction or damage to terrestrial or aquatic ecosystems or endangered species directly or through induced development?		
16	The subproject he causes disruption / destruction of nature by the interruption of migration routes, disruption of wildlife habitat and noise problems?		
F	Destruction / disturbance of the Land Use and Vegetation		
17	He induced the subproject to a destruction of the soil in the long term or semi-permanently in cleared areas not suitable for agriculture?		
18	The subproject he favors the interruption of underground drainage and surface water (in areas of excavation and backfilling)?		
19	The subproject he favors the landslide, collapse, subsidence and other ground movements at earthmoving road?		
20	The subproject he causes soil erosion under the platform area		

	subject to intense flow carried by covered sewers or open?		
21	He induced the subproject to a destruction of the soil in the long term or semi-permanently in cleared areas not suitable for agriculture?		
G	Cultural goods		
22	The sub-project there will be a negative impact on archaeological or historical sites, including the historic urban areas?		
23	Does the subproject will negatively impact religious monuments, infrastructure and / or cemeteries?		
Н	Expropriation and Social Disruption		
24	The land acquisition or loss, denial or restriction of access to land and other economic resources will they be the result of the project in question?		
25	The subproject he causes a relocation induced by other workers and causing social and economic disruption?		

II. Character é site tics

No S	Problems	Yes	No	Obs.
1	Is the subproject located in an area designated bridling nature reserves?			
2	Is the subproject located in an area providing unique natural characteristics?			
3	Is the subproject located in an area ecosystem, wildlife or endangered flora or deserving to be preserved?			
4	Is the subproject located in an area within 500 meters of national forests, protected areas, wild natural areas, wetlands, biodiversity, critical habitats, or sites of historic or cultural importance?			
5	Is the subproject located in a polluted or contaminated area?			
6	Is the sub-project located in a sensitive area to landslide or erosion?			
7	Is the sub-project located in a densely populated area?			
8	The subproject is it situated on soil for agricultural use?			
9	Is the subproject located in an important tourist			

	area?		
10	Is the subproject located near a garbage dump?		
11	Is the subproject juxtaposed to a busy road?		

Part C: Mitigation

For all the answers "Yes" the sponsor in consultation with local communities will briefly

For all the answe	ers "Yes", the spo	nsor in consi	ultatio	n with lo	cal communities will briefly	
describe the measures taken for this purpose.						
Part D: Project classification and environmental work						
The results of Parts A, B and C, check the sub-project category:						
class A		Category B		category C		
Environmental Working Suggestion needed:						
environmental work			Yes	No	observations	
Ineligible subproj	ject					
Change sub-proje	ect site					
independent EIA	required					
(Category A)						
Conduct a simplified EIA or EERP						
(Category B)						
No EIA required						
Done at,the						
The person comp	oleting this form					
Name:						
Title:						
Signature:						
Name of the local authority which approves						

Appendix 4. Presort Sheet

1. **GENERAL INFORMATION**

- a) Project initiator:
- b) Name of Technical Manager:
- c) Title:
- d) Location:

2. **T** PROJECT YPE

CRITERIA	YES	No	OBSERVATIONS
Planting cane to sugar			
 Arrangement of land for planting 			
sugarcane			
Use of pesticides			
• Installation of 'a unit ed micro-distillery			
 Arrangement of courses for 'Installation 			
of the ' unit	•		
D é involuntary population			
• Using machines and e equipments various			
Use of chemicals			
 Production of flammable 			
Activity é s with risks ' accidents			
Other (to pr é specify)			

You can tick several boxes at once.

Brief technical description Location (attach a simplified map)

3. **Environment Project**

b. D é describe the particularities é s of the following components s ' there :

CRITERIA	YES	No	OBSERVATIONS
Ground			
Topography			
Vegetation in the execution of the project area			
necessary pruning			
Cutting trees			
sensitive areas or particular species			

b. Proximit é

	CRITERIA	YES	No	OBSERVATIONS
River				
Lake				

Other water			
		4. S CI	ENERY / ESTH E TICK
CRITERIA	YES	No	OBSERVATIONS
possible negative impact on the visual landscape			
			STORICAL SITE, ARCH É OLOGICAL OR H É CULTURAL BERITANCE
CRITERIA	YES	No	OBSERVATIONS
Heritage culturally If so, what kinds?			
	1	6. Co	MPENSATION / LAND ACQUISITION / EASEMENTS
CRITERIA	YES	No	OBSERVATIONS
Acquisition of land			
Loss of income of affected households			
Restriction of access to resources or goods			
Crop loss			
Loss of Utility trees			
source of revenue loss			
other losses			
10) Ровы Consultation and public participat	E RES R CTS R É S IC CONS tion ar UP POLI	SIDUELS ULTATIO e they CIES É C	ANTICIP E S ON required? Yes No LENCH É ES
OP 4.12 - R é involuntary in	nstallir	ng peo	ple
purpose.	nswers	s "Yes'	briefly describe the steps taken for this
13) Proji	ECT CLAS	SSIFICAT	TION AND ENVIRONMENTAL WORK
No environmental work .	•••••	•••••	
Simple mitigation measure	es		
 Plan Environmental and So 	ocial M	lanage	ement

14) Additional documents required

- Environmental Management Plan (EMP)
- Analysis simplified é e of the risks and dangers
- Plan r é facility (PAR)

Appendix 5. Copy of the Operational Policy PO4.01 WB



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Le présent document est la traduction du texte anglais de l'**OP 4.01**, « **Environmental Assessment** », en date de **janvier 1999**, qui contient la formulation de cette directive qui a été approuvée par la Banque mondiale. En cas de divergence entre le présent document et la version anglaise de l'**OP 4.01**, en date de **janvier 1999**, c'est le texte anglais qui prévaudra.

Évaluation environnementale

Note : Les présentes PO et PB sont applicables à tous les projets pour lesquels un document d'information aura été publié après le 1^{er} mars 1999. Pour toutes questions, on pourra s'adresser au Président de la Commission technique de l'environnement.

- 1. La Banque¹ exige que les projets qui lui sont présentés pour financement fassent l'objet d'une évaluation environnementale (ÉE) qui contribue à garantir qu'ils sont environnementalement rationnels et viables, et par là améliore le processus de décision.
- 2. L'Évaluation environnementale est un processus, dont l'ampleur, la complexité et les caractéristiques sur le plan de l'analyse dépendent de la nature et de l'échelle du projet proposé, et de l'impact qu'il est susceptible d'avoir sur l'environnement. Elle consiste à évaluer les risques que peut présenter le projet pour l'environnement et les effets qu'il est susceptible d'exercer dans sa zone d'influence², à étudier des variantes du projet, à identifier des moyens d'améliorer la sélection du projet, sa localisation, sa planification, sa conception et son exécution en prévenant, en minimisant, en atténuant ou en compensant ses effets négatifs sur l'environnement, et en renforçant ses effets positifs ; l'ÉE inclut aussi le processus d'atténuation et de gestion des nuisances pendant toute la durée de l'exécution. La Banque préconise l'emploi de mesures préventives de préférence à des mesures d'atténuation ou de compensation, chaque fois que cela est possible.

^{1.} Le terme « Banque » désigne également l'IDA; le sigle « ÉE » désigne l'intégralité du processus décrit dans la PO/PB 4.01; le terme « prêts » désigne également les crédits; le terme « emprunteur » désigne également, s'agissant d'opérations de garantie, un promoteur de projet, public ou privé, recevant d'une autre institution financière un prêt garanti par la Banque; et le terme « projet » désigne toutes les opérations financées par des prêts ou garanties de la Banque, à l'exception des prêts à l'ajustement structurel (pour lesquels les dispositions relatives à l'environnement sont fixées dans l'OP/BP 8.60, « Adjustment Lending », à paraître) et des opérations de réduction de la dette et du service de la dette; le terme désigne également les projets au titre de prêts à des programmes évolutifs (APL) et de prêts au développement des connaissances et à l'innovation (LIL), et les projets et composantes financées par le Fonds pour l'environnement mondial. Le projet est décrit dans l'annexe 2 à l'Accord de Crédit/de Prêt. La présente politique s'applique à toutes les composantes du projet, quelle que soit leur source de financement.

Pour les définitions, voir l'Annexe A. La zone d'influence d'un projet est définie sur les conseils des spécialistes de l'environnement et figure dans les termes de référence de l'ÉE.

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- 3. L'Évaluation environnementale prend en compte le milieu naturel (air, terre et eau), la santé et la sécurité de la population, des aspects sociaux (déplacements involontaires de personnes, populations autochtones et patrimoine culturel)³, et les problèmes d'environnement transfrontières et mondiaux⁴. Elle envisage le contexte naturel et le contexte social d'une manière intégrée. Elle tient compte aussi des variations du contexte du projet et de la situation nationale, des conclusions des études menées sur l'environnement du pays, des plans nationaux d'action environnementale, du cadre de politique générale du pays, de sa législation nationale et de ses capacités institutionnelles en matière d'environnement et de société, ainsi que des obligations incombant au pays en rapport avec les activités du projet, en vertu des traités et accords internationaux sur l'environnement pertinents. La Banque ne finance pas des activités de projet qui iraient à l'encontre des obligations du pays telles qu'identifiées durant l'ÉE. Cette ÉE est entreprise le plus tôt possible lors du traitement du dossier du projet et est étroitement liée aux travaux d'analyse dont celui-ci fait l'objet du point de vue économique, financier, institutionnel, social et technique.
- 4. La réalisation de l'ÉE est du ressort de l'emprunteur. Pour les projets relevant de la Catégorie A⁵, l'emprunteur confie l'évaluation environnementale à des experts indépendants qui ne sont nullement associés au projet⁶. Pour les projets de Catégorie A très risqués ou controversés, ou qui soulèvent des problèmes graves et pluridimensionnels pour l'environnement, l'emprunteur doit aussi normalement engager un panel consultatif de spécialistes de l'environnement indépendants, de renommée internationale, pour le conseiller sur tous les aspects du projet relevant de l'ÉE². Le rôle de ce panel consultatif est fonction du degré d'avancement de la préparation du projet, et de l'étendue et de la qualité du tout travail d'évaluation environnementale accompli au moment où la Banque commence à étudier le projet.

^{3.} Cf. PO/PB 4.12, « Déplacements Involontaires de Personnes », (à paraître); OD 4.20, « Indigenous People ou Populations Autochtones? »; et OP 4.11, « Safeguarding Cultural Property in Bank-Financed Projects » (à paraître).

Les problèmes d'environnement mondiaux sont les changements climatiques, l'appauvrissement de la couche d'ozone, la pollution des eaux internationales, et les effets négatifs sur la biodiversité.

Pour ce qui est de l'examen environnemental préalable, on se reportera au paragraphe 8.

^{6.} L'ÉE est étroitement liée aux analyses économiques, financières, institutionnelles, sociales et techniques entreprises à l'occasion du projet de manière à ce que : a) les considérations environnementales soient adéquatement prises en compte pour la sélection, la localisation, et le choix de la conception du projet ; et que b) l'ÉE ne retarde pas l'instruction du projet. Toutefois, l'emprunteur veille à éviter tout conflit d'intérêt lors de l'engagement de personnes physiques ou d'entités pour la réalisation de l'ÉE. Ainsi, lorsqu'il faut une ÉE indépendante, elle n'est pas confiée à des consultants engagés pour préparer les dossiers techniques.

^{7.} Le panel (qui est différent du panel de vérification de la sécurité du barrage requis par l'OP/BP 4.37, « Safety of Dams ») conseille l'emprunteur précisément sur les aspects suivants : a) termes de référence de l'ÉE, b) principales questions à aborder dans l'ÉE et méthodes à employer, c) recommandations et conclusions de l'ÉE, d) application de ces recommandations, et e) renforcement des capacités de gestion de l'environnement.

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- 5. La Banque informe l'emprunteur de ses exigences en matière d'Évaluation environnementale. Elle examine les conclusions et les recommandations de l'ÉE pour établir si celles-ci peuvent fournir une base adéquate à l'instruction de la demande de financement du projet par la Banque. Lorsque l'emprunteur a terminé tout ou partie de l'ÉE avant l'implication de la Banque dans le projet, la Banque examine l'ÉE pour vérifier si la démarche suivie est conforme à la présente politique. La Banque peut, le cas échéant, demander un supplément d'ÉE, y compris une consultation et une information du public.
- 6. Le manuel intitulé « *Pollution Prevention and Abatement Handbook* » indique les mesures de prévention et de réduction de la pollution et les niveaux d'émission qui sont normalement jugés acceptables par la Banque. Toutefois, compte tenu de la législation du pays de l'emprunteur et de la situation locale, l'ÉE peut recommander d'autres niveaux d'émission et méthodes de prévention et de réduction de la pollution pour le projet. Le rapport d'ÉE doit fournir une justification complète et détaillée des niveaux et des méthodes retenues pour le projet ou le site en cause.

Instruments d'Évaluation environnementale

7. Selon le projet, on choisira parmi toute une gamme d'instruments pour satisfaire aux stipulations de la Banque en matière d'ÉE: étude d'impact sur l'environnement (EIE), évaluation environnementale (ÉE) régionale ou sectorielle, audit environnemental, évaluation des dangers ou des risques et plan de gestion environnementale⁸. L'ÉE a recours au moins un de ces instruments, ou à certains éléments d'entre eux, en tant que de besoin. Lorsque le projet est susceptible d'avoir des impacts sectoriels ou régionaux, une ÉE sectorielle ou régionale est obligatoire⁹.

Examen environnemental préalable

8. Pour chaque projet envisagé, la Banque procède à un examen environnemental préalable afin de déterminer la portée que doit avoir l'ÉE, et le type d'instrument d'ÉE à employer. Elle classe le projet dans l'une des quatre catégories existantes en fonction des diverses particularités de ce projet — type, emplacement, degré de sensibilité, échelle, nature et ampleur de ses incidences environnementales potentielles.

Ces termes sont définis à l'Annexe A, tandis que les Annexes B et C examinent les éléments constitutifs des Rapports d'ÉE et des Plans de gestion environnementale.

On trouvera des indications sur le recours aux ÉE sectorielles et régionales dans l'« EA Sourcebook, Updates 4 et 15 ».

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- a) Catégorie A: Un projet envisagé est classé dans la catégorie A s'il risque d'avoir sur l'environnement des incidences très négatives, névralgiques¹⁰, diverses, ou sans précédent. Ces effets peuvent être ressentis dans une zone plus vaste que les sites ou les installations faisant l'objet des travaux. Pour un projet de catégorie A, l'ÉE consiste à examiner les incidences environnementales négatives et positives que peut avoir le projet, à les comparer aux effets d'autres options réalisables (y compris, le cas échéant, du scénario « sans projet »), et à recommander toutes mesures éventuellement nécessaires pour prévenir, minimiser, atténuer ou compenser les incidences négatives du projet et améliorer sa performance environnementale. L'emprunteur est responsable de l'établissement du rapport, qui doit généralement prendre la forme d'une étude d'impact sur l'environnement-EIE (ou une ÉE sectorielle ou régionale d'une portée appropriée) qui emprunte, en tant que de besoin, des éléments aux autres instruments mentionnés au paragraphe 7.
- b) Catégorie B: Un projet envisagé est classé dans la catégorie B si les effets négatifs qu'il est susceptible d'avoir sur les populations humaines ou sur des zones importantes du point de vue de l'environnement zones humides, forêts, prairies et autres habitats naturels, etc. sont moins graves que ceux d'un projet de catégorie A. Ces effets sont d'une nature très locale; peu d'entre eux (sinon aucun), sont irréversibles; et dans la plupart des cas, on peut concevoir des mesures d'atténuation plus aisément que pour les effets des projets de catégorie A. l'ÉE peut, ici, varier d'un projet à l'autre mais elle a une portée plus étroite que l'ÉE des projets de catégorie A. Comme celle-ci, toutefois, elle consiste à examiner les effets négatifs et positifs que pourrait avoir le projet sur l'environnement, et à recommander toutes mesures éventuellement nécessaires pour prévenir, minimiser, atténuer ou compenser les effets négatifs et améliorer la performance environnementale. Les conclusions et les résultats des ÉE de projets de Catégorie B sont consignés dans la documentation du projet (Document d'évaluation du projet-PAD et Document d'information sur le projet-PID)¹¹.
- 10. Un impact potentiel est considéré comme « névralgique » s'il peut s'avérer irréversible (par ex.,entraîner la disparition d'un habitat naturel d'importance majeure) ou soulever des problèmes relevant de l'OD 4.20, « Indigenous Peoples », de la PO 4.04, « Habitats naturels », de l'OP 4.11, « Safeguarding Cultural Property in Bank-Financed Projects » (à paraître), ou de l'OP 4.12, « Involuntary Resettlement » (à paraître).
- 11. Lorsque l'examen environnemental préalable établit, ou que la législation nationale stipule, qu'une quelconque des questions environnementales relevées mérite une attention particulière, les conclusions et les résultats de l'ÉE afférente au projet de Catégorie B peuvent être consignés dans un rapport séparé. Selon le type de projet et la nature et l'ampleur des effets, le rapport peut comporter, par exemple, une étude d'impact environnemental limitée, un plan de gestion environnementale, ou d'atténuation des effets, un audit environnemental, ou une évaluation des dangers. Pour les projets de Catégorie B qui ne sont pas situés dans des zones névralgiques pour l'environnement et qui présentent des problèmes bien définis et bien compris de portée restreinte, la Banque peut accepter d'autres moyens de satisfaire à l'obligation d'évaluation environnementale : par exemple, des critères de conception respectueux de l'environnement, des critères de localisation, ou des normes de pollution s'il s'agit de petites installations industrielles ou d'ouvrages ruraux ; des critères de localisation respectueux de l'environnement, des normes de construction ou des procédures d'inspection pour les projets de logement ; ou des procédures opérationnelles respectueuses de l'environnement pour les projets de réfection de routes.

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- c) Catégorie C : Un projet envisagé est classé dans la catégorie C si la probabilité de ses effets négatifs sur l'environnement est jugée minime ou nulle.
 - Après l'Examen environnemental préalable, aucune autre mesure d'ÉE n'est nécessaire pour les projets de catégorie C.
- d) Catégorie FI: Un projet envisagé est classé dans la catégorie FI si la Banque y investit des fonds au travers d'un intermédiaire financier, dans des sous-projets susceptibles d'avoir des effets négatifs sur l'environnement.

Évaluation environnementale afférente à des types de projet particuliers

Prêts d'investissement sectoriel

Pour les prêts d'investissement sectoriel¹², lors de la préparation de chaque sous-projet envisagé, l'entité qui assure la coordination du projet ou l'agence d'exécution procède aux ÉE requises par le pays et la présente politique¹³. La Banque évalue et, le cas échéant, inclut dans le projet des composantes visant à mettre l'entité qui assure la coordination du projet ou l'agence d'exécution, mieux à même : a) de préselectionner les sous-projets ; b) de se doter des compétences spécialisées nécessaires pour réaliser une ÉE ; c) d'examiner les conclusions et les résultats des ÉE des divers sous-projets ; d) de veiller à la mise en oeuvre des mesures d'atténuation (y compris, le cas échéant, d'un plan de gestion environnementale) ; et e) de surveiller les conditions ambiantes pendant l'exécution du projet¹⁴. Si la Banque n'a pas établi à sa satisfaction l'existence de capacités permettant d'effectuer les ÉE, tous les sous-projets de Catégorie A et, le cas échéant, ceux relevant de la Catégorie B — y compris tout rapport d'ÉE — sont soumis à la Banque pour examen préalable et approbation.

Ces prêts donnent généralement lieu à la préparation et à l'exécution de plans d'investissement annuels, ou de sous-projets échelonnés pendant la durée du projet.

^{13.} Par ailleurs, s'il existe des problèmes sectoriels qui ne peuvent être traités dans le cadre de l'ÉE d'un sous-projet (notamment si le prêt d'investissement sectoriel est susceptible de comporter des sous-projets de Catégorie A), l'emprunteur peut être tenu d'effectuer une ÉE sectorielle avant l'évaluation du prêt par la Banque.

^{14.} Lorsque, en application de réglementations ou de dispositions contractuelles jugées satisfaisantes par la Banque, l'une quelconque de ces fonctions d'examen est confiée à une entité autre que celle qui coordonne le projet ou que l'agent d'exécution du projet, la Banque évalue ces autres types de dispositions ; mais c'est l'emprunteur/l'entité coordinatrice/l'organisme d'exécution qui reste chargé, en dernière analyse, de veiller à ce que les sous-projets respectent les règles fixées par la Banque.

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Prêts à l'ajustement sectoriel

10. Les prêts à l'ajustement sectoriel (SECAL) sont visés par les stipulations de la présente politique. L'ÉE d'un prêt à l'ajustement sectoriel évalue les effets potentiels sur l'environnement des mesures directives, institutionnelles et réglementaires envisagées au titre du prêt, au niveau des orientations /de la politique générale, des institutions, et de la réglementation 15.

Prêts à des intermédiaires financiers

- 11. Pour les opérations avec des intermédiaires financiers, la Banque attend de chacun de ceux-ci qu'ils procèdent à un examen préalable des sous-projets envisagés et fassent en sorte que les emprunteurs secondaires réalisent une ÉE appropriée pour chaque sous-projet. Avant d'approuver un sous-projet, l'intermédiaire vérifie (par le biais de son propre personnel, de consultants spécialisés ou d'institutions environnementales existantes) que le sous-projet respecte les règles environnementales fixées par les autorités nationales et locales appropriées, et est conforme à la présente PO et aux autres politiques environnementales applicables de la Banque¹⁶.
- 12. Lorsqu'elle évalue une opération avec un intermédiaire financier, la Banque détermine si les règles environnementales nationales applicables au projet et les modalités d'ÉE proposées pour les sous-projets, y compris les mécanismes d'examen environnemental préalable et d'analyse des résultats des ÉE, et l'attribution de la responsabilité de ces activités, sont satisfaisantes. Le cas échéant, la Banque fait en sorte que soient incluses dans le projet des composantes propres à renforcer ces dispositions d'ÉE. Lorsqu'on s'attend à ce que ces opérations comportent des sous-projets de Catégorie A, avant l'évaluation du projet par la Banque, chaque intermédiaire financier dont la participation est prévue fournit à la Banque une évaluation écrite des mécanismes institutionnels (assortie, le cas échéant, de la définition de mesures de renforcement des capacités) dont il dispose pour effectuer les ÉE afférentes à ses sous-projets ¹⁷. Si la Banque n'a pas établi à sa satisfaction l'existence de capacités permettant d'effectuer les ÉE, tous les sous-projets de Catégorie A et, le cas échéant, ceux relevant de la Catégorie B y compris tout rapport d'ÉE sont soumis à la Banque pour examen préalable et approbation ¹⁸.
- 15. Les mesures devant être ainsi évaluées sont, par exemple, la privatisation d'entreprises exerçant des activités critiques pour l'environnement, les réformes du régime foncier dans des zones où existent des habitats naturels importants, et des modifications des prix relatifs de produits tels que les pesticides, le bois d'oeuvre et les produits pétroliers.
- 16. Les règles applicables aux opérations avec des intermédiaires financiers reposent sur le processus d'ÉE et sont conformes aux dispositions du paragraphe 6 de la présente PO. L'ÉE est fonction du type de financement envisagé, de la nature et de l'échelle des sous-projets prévus, et des règles environnementales en vigueur dans la juridiction où seront implantés les sous-projets.
- La participation de tout intermédiaire financier associé au projet après son évaluation est subordonnée au respect de la même règle.
- 18. Les critères d'examen préalable des sous-projets de Catégorie B, qui font appel à des facteurs comme le type ou l'échelle du sous-projet et la capacité d'ÉE de l'intermédiaire financier, sont fixés dans les accords juridiques du projet.

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Projets de reconstruction d'urgence

13. La politique énoncée dans la PO 4.01 s'applique normalement aux projets d'urgence à l'appui de la reconstruction dont le dossier est instruit au titre de l'OP 8.50, « Emergency Recovery Assistance ». Cependant, si le respect de l'une quelconque des stipulations de la présente politique empêche la réalisation effective et en temps voulu des objectifs d'un projet de ce type, la Banque peut dispenser le projet d'y satisfaire. La justification de pareille dérogation est consignée dans les documents du prêt. Néanmoins, la Banque exige toujours, au minimum : a) que l'on détermine, dans le cadre de la préparation de projets de ce type, dans quelle mesure la situation d'urgence a été provoquée ou aggravée par des pratiques environnementales inappropriées ; et b) que les éventuelles mesures correctives nécessaires soient prévues dans le cadre du projet d'urgence proprement dit, ou d'une opération de prêt ultérieure.

Capacités institutionnelles

14. Lorsque l'emprunteur ne dispose pas de capacités juridiques ou techniques suffisantes pour s'acquitter de fonctions clés en rapport avec l'ÉE (examen des ÉE, surveillance de l'environnement, inspections, ou application des mesures d'atténuation) d'un projet envisagé, le projet prévoit des composantes visant à renforcer ces capacités

Consultation du public

15. Pour tous les projets de Catégorie A et B dont le financement par la BIRD ou l'IDA est envisagé, au cours du processus d'ÉE, l'emprunteur consulte les groupes affectés par le projet et les organisations non-gouvernementales (ONG) locales sur les aspects environnementaux du projet, et tient compte de leurs points de vue¹⁹. L'emprunteur engage ces consultations dès que possible. Pour les projets de catégorie A, l'emprunteur consulte ces groupes au moins à deux reprises : a) peu de temps après l'examen environnemental préalable et avant la finalisation des termes de référence de l'ÉE; et b) une fois établi le projet de rapport d'ÉE. Par ailleurs, l'emprunteur consulte ces groupes tout au long de l'exécution du projet, en tant que de besoin pour traiter des questions soulevées par l'ÉE qui les concernent²⁰.

En ce qui concerne la démarche adoptée par la Banque vis-à-vis des ONG, cf. GP 14.70, « Involving Nongovernmental Organizations in Bank-Supported Activities ».

^{20.} Pour les projets comportant des composantes sociales majeures, des consultations sont également exigées par d'autres politiques opérationnelles de la Banque — par exemple, les OD 4.20, « Indigenous Peoples », et 4.30, « Involuntary Resettlement ».

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Diffusion d'information

- 16. Pour permettre des consultations fructueuses entre l'emprunteur et les groupes affectés par le projet et les ONG locales sur tous les projets de Catégorie A et B dont le financement est envisagé par la BIRD ou l'IDA, l'emprunteur fournit une documentation pertinente en temps voulu avant la consultation, sous une forme et dans une langue compréhensibles par les groupes consultés.
- 17. S'agissant d'un projet de Catégorie A, l'emprunteur communique, en vue de la consultation initiale, un résumé des objectifs, de la description et des effets potentiels du projet envisagé ; en vue de la consultation organisée après l'établissement du projet de rapport d'ÉE, un résumé des conclusions de cette ÉE. Par ailleurs, pour les projets de Catégorie A, l'emprunteur dépose le projet de rapport d'ÉE dans un lieu public accessible aux groupes affectés et aux ONG locales. En ce qui concerne les prêts d'investissement sectoriel et les opérations avec des intermédiaires financiers, l'emprunteur/l'intermédiaire financier fait en sorte que les rapports d'ÉE afférents aux sous-projets de Catégorie A soient disponibles dans un lieu public accessible aux groupes affectés et aux ONG locales.
- 18. Tout rapport distinct afférent à un projet de Catégorie B dont le financement est envisagé par l'IDA est mis à la disposition des groupes affectés par le projet et des ONG locales. L'évaluation par la Banque des projets de Catégorie A dont le financement par la BIRD ou l'IDA est envisagé et de tout projet de Catégorie B ayant fait l'objet d'un rapport d'ÉE dont le financement par l'IDA est envisagé est subordonnée à la mise à la disposition du public de ces rapports dans le pays de l'emprunteur, et de leur réception officielle par la Banque.
- 19. Une fois que l'emprunteur lui a officiellement communiqué un rapport d'ÉE, s'il porte sur un projet de Catégorie A, la Banque en distribue le résumé (en anglais) à ses Administrateurs, et elle met le rapport proprement dit à la disposition du public par l'intermédiaire de son Infoshop²¹. S'il s'agit d'un rapport d'ÉE distinct afférent à un projet de catégorie B, la Banque le met à la disposition du public par l'intermédiaire de son Infoshop. Si l'emprunteur s'oppose à ce que la Banque mondiale diffuse un rapport d'ÉE par le biais de son Infoshop, les services de la Banque : a) s'il s'agit d'un projet de l'IDA, suspendent l'instruction du projet ; ou b) si c'est un projet de la BIRD, s'en remettent aux Administrateurs pour savoir s'il convient de poursuivre l'instruction de ce projet.

Ces politiques ont été établies à l'intention des services de la Banque mondiale et ne constituent pas nécessairement un traitement exhaustif du sujet.

^{21.} Pour une plus ample discussion des procédures d'information de la Banque, on se reportera à la « Politique de la Banque mondiale en matière de diffusion d'informations » (mars 1994) et à la BP 17.50, « Disclosure of Operational Information ». Des obligations particulières de divulgation des plans de réinstallation et des plans de développement des populations autochtones sont énoncées dans l'OP/BP 4.12, « Involuntary Resettlement » (à paraître) et l'OP/BP 4.10, révision à paraître de l'OD 4.20, « Indigenous People ».

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Exécution

20. Durant l'exécution du projet, l'emprunteur rend compte : a) de l'application des mesures convenues avec la Banque sur la base des conclusions et des résultats de l'ÉE, y compris de la mise en oeuvre d'un éventuel Plan de gestion environnementale, conformément aux dispositions des documents du projet ; b) de l'état d'avancement des mesures d'atténuation ; et c) des résultats obtenus dans le cadre des programmes de surveillance. Les services de la Banque supervisent les aspects environnementaux du projet, sur la base des conclusions et des recommandations de l'ÉE, y compris des mesures stipulées dans les accords juridiques, de tout Plan de gestion environnementale , et des autres documents du projet ²².

Ces politiques ont été établies à l'intention des services de la Banque mondiale et ne constituent pas nécessairement un traitement exhaustif du sujet.

^{22.} Cf. OP/BP 13.05, « Project Supervision », à paraître.

Appendix 6. Copy of the Operational Policy PO4.09 WB

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PO 4.09 Décembre 1998 Page 1

Le présent document est la traduction du texte anglais de l'**OP 4.09**, « **Pest Management** », en date de **décembre 1998**, qui contient la formulation de cette directive qui a été approuvée par la Banque mondiale. En cas de divergence entre le présent document et la version anglaise de l'**OP 4.09**, en date de **décembre 1998**, c'est le texte anglais qui prévaudra.

Lutte antiparasitaire

Note : Les questions relatives à la lutte contre les ennemis des cultures peuvent être adressées au Directeur du Département du développement rural. Celles concernant l'usage de pesticides dans les projets de santé publique peuvent être posées au Directeur du Département des services de santé.

- 1. Pour aider ses emprunteurs à combattre les organismes nuisibles à l'agriculture ou à la santé publique, la Banque¹ privilégie une stratégie qui encourage l'utilisation de méthodes biologiques ou environnementales et limite le recours aux pesticides chimiques de synthèse. Dans les projets financés par la Banque, l'Emprunteur traite de la lutte antiparasitaire dans le cadre de l'évaluation environnementale réalisée à l'occasion du projet².
- 2. Lors de l'évaluation d'un projet comportant des activités de lutte antiparasitaire, la Banque apprécie dans quelle mesure le cadre réglementaire et les institutions du pays considéré sont de nature à promouvoir et faciliter l'adoption de méthodes sans risque, efficaces et respectueuses de l'environnement. Le cas échéant, la Banque et l'Emprunteur inscrivent au projet des composantes destinées à renforcer les capacités existant en la matière.

Lutte contre les ennemis des cultures³

- 3. La Banque utilise différents instruments pour évaluer la situation dans le pays considéré et pour encourager la lutte phytosanitaire intégrée⁴ et l'utilisation prudente de pesticides agricoles. Il s'agit notamment d'études économiques et sectorielles, d'évaluations environnementales propres à un secteur ou à un projet donné, d'évaluations participatives d'activités de lutte intégrée et de projets d'ajustement ou d'investissement, ou de leurs composantes, qui visent expressément à contribuer à l'adoption et à la conduite d'activités de lutte intégrée.
- 4. Dans les opérations agricoles financées par la Banque, la lutte antiparasitaire a normalement un caractère intégré, faisant intervenir des méthodes telles que le contrôle biologique, les façons culturales et la mise au point et l'utilisation de variétés résistantes ou tolérantes. La Banque peut financer l'achat de pesticides lorsque leur utilisation se justifie dans le cadre d'une stratégie de lutte phytosanitaire intégrée.

Lutte antivectorielle

5. Dans les projets que la Banque finance dans le domaine de la santé publique, l'institution privilégie la lutte contre les vecteurs de maladie par des méthodes environnementales. Lorsque celles-ci ne sont pas suffisamment efficaces, la Banque peut financer l'utilisation de pesticides.

^{1.} Le terme « Banque » désigne également l'IDA et le terme « prêts » désigne aussi les crédits.

Voir PO/PB 4.01, Évaluation environnementale

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Critères de sélection et d'utilisation des pesticides

- 6. L'achat de tout pesticide dans le cadre d'un projet financé par la Banque est subordonné aux résultats d'une évaluation de la nature et de l'importance des risques encourus, en fonction de l'utilisation envisagée et des utilisateurs prévus⁵. S'agissant de la classification des pesticides et des formules propres à chacun des produits considérés, la Banque se réfère aux *Lignes directrices pour la classification des pesticides par risque telle que recommandée par l'Organisation mondiale de la santé* (Genève, OMS 1994-1995)⁶. Les critères suivants sont applicables à la sélection et à l'utilisation des pesticides dans le cadre des projets financés par la Banque :
 - a) Les produits retenus doivent avoir des effets négligeables sur la santé humaine.
 - b) Leur efficacité contre les espèces visées doit être établie.
 - c) Ils doivent avoir des effets très limités sur les espèces non ciblées et sur l'environnement. Les méthodes, le moment de l'intervention et la fréquence des applications doivent permettre de protéger au maximum les ennemis naturels. Il doit être démontré que les pesticides utilisés dans le cadre des programmes de santé publique sont inoffensifs pour les habitants et les animaux domestiques dans les zones traitées, ainsi que pour le personnel qui les applique.
 - d) Leur utilisation doit tenir compte de la nécessité de prévenir l'apparition d'espèces résistantes.
- 7. La Banque exige que les pesticides dont elle finance l'achat soient fabriqués, conditionnés, étiquetés, manipulés, entreposés, éliminés et appliqués conformément à des normes qu'elle juge satisfaisantes⁷. La Banque ne finance pas les préparations chimiques qui appartiennent aux classes IA et IB de l'OMS, ni la formulation de produits de la Classe II a) si leur distribution et leur emploi ne sont pas réglementés dans le pays en question ou b) si des non-spécialistes, des agriculteurs ou d'autres personnes risquent de les utiliser ou d'y avoir facilement accès sans la formation, le matériel et les installations nécessaires pour les manipuler, les entreposer et les appliquer correctement.
- 3. La présente PO 4.09 s'applique à toutes les opérations de prêt de la Banque, que les fonds accordés financent ou non l'achat de pesticides. Même si un prêt de la Banque ne prévoit pas un tel achat, un projet de développement agricole peut conduire à une nette intensification du recours aux pesticides et avoir par-là des retombées préjudiciables à l'environnement.
- 4. Le terme « Lutte phytosanitaire intégrée » (integrated pest managemen-IPM) désigne un ensemble de méthodes écologiques et faisant appel à l'initiative de l'agriculteur, qui visent à limiter le recours aux pesticides chimiques de synthèse. Il s'agit a) de maîtriser les ravageurs (c'est-àdire de les empêcher d'atteindre un niveau où ils causeraient un préjudice économique), plutôt que de chercher à les éradiquer; b) d'appliquer dans toute la mesure du possible des mesures non chimiques pour limiter le développement des populations d'organismes nuisibles; et c) de sélectionner et d'appliquer des pesticides, lorsque leur utilisation s'impose, d'une façon qui réduit au minimum les effets négatifs sur les organismes utiles, les êtres humains et l'environnement.
- 5. Ce travail est réalisé dans le cadre de l'évaluation environnementale à laquelle le projet donne lieu. Ces résultats sont consignés dans le dossier du projet considéré. Ce dossier comporte également (dans le corps même du texte ou en annexe) une liste des pesticides dont l'achat est autorisé ou une indication du délai et des modalités applicables à la préparation et à l'approbation de cette liste. Les documents juridiques relatifs au projet font mention de la liste des produits autorisés, qui peut être complétée ou réduite.
- Des exemplaires de cette classification, qui est mise à jour chaque année, sont déposés à la bibliothèque sectorielle. On peut obtenir une version préliminaire du dossier d'appels d'offres standard pour les marchés de pesticides en s'adressant à OCSPR.
- 7. Les Directives pour le conditionnement et le stockage des pesticides (Rome, 1985), les Directives sur les bonnes pratiques d'étiquetage des pesticides (Rome, 1985) et les Directives pour l'élimination des excédents de pesticides et de leurs récipients (Rome, 1985) de la FAO sont les normes minima appliquées par la Banque.

Ces politiques ont été établies à l'intention des services de la Banque mondiale et ne constituent pas nécessairement un traitement exhaustif du suiet.

Appendix 7. Copy of the Operational Policy PO4.12 WB

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Le présent document est la traduction du texte anglais de la **OP 4.12**, « **Involuntary Resettlement** », en date de **décembre 2001**, qui contient la formulation de cette directive qui a été approuvée par la Banque mondiale. En cas de divergence entre le présent document et la version anglaise de la **OP 4.12**, en date de **décembre 2001**, c'est le texte anglais qui prévaudra.

Réinstallation involontaire de personnes

1. L'expérience de la Banque¹ montre que, si elle n'est pas bien organisée, la réinstallation involontaire intervenant dans le cadre des projets de développement engendre souvent de graves problèmes économiques, sociaux et environnementaux : les systèmes de production sont démantelés ; les populations voient leurs moyens de production s'amenuiser ou perdent leurs sources de revenu ; elles sont relocalisées dans des environnements où leurs techniques de production risquent d'être moins performantes et la compétition sur les ressources plus forte ; les structures communautaires et les réseaux sociaux sont affaiblis ; les groupes de parenté sont dispersés ; l'identité culturelle, l'autorité traditionnelle et les possibilités d'entraide sont amoindries ou ruinées. Cette politique renferme des sauvegardes pour affronter et réduire ces risques d'appauvrissement.

Objectifs de la politique

- 2. Si des mesures appropriées ne sont pas soigneusement planifiées et mises en œuvre, la réinstallation involontaire peut provoquer des conséquences dommageables sur le long terme, un appauvrissement et des dommages environnementaux. C'est pour quoi les objectifs globaux de la politique de la Banque sur la réinstallation involontaire sont les suivants :
 - a) On s'efforcera d'éviter, dans la mesure du possible, ou de minimiser la réinstallation involontaire en étudiant toutes les alternatives réalisables dans la conception du projet².
 - b) Lorsqu'un déplacement de population est inévitable, les activités de réinstallation devront être conçues et exécutées sous la forme de programmes de développement procurant aux personnes déplacées par le projet suffisamment de moyens d'investissement pour leur permettre de bénéficier des avantages du projet. Les populations déplacées³ devront être consultées de

[«] Banque » inclut l'IDA; « prêts » englobe les crédits, les garanties, les avances et dons accordés au titre du Fonds de préparation de projet (PPF); et « projets » inclut toutes les opérations financées dans le cadre a) des Prêts-programmes évolutifs; b) des Prêts au développement des connaissances et à l'innovation; c) du PPF et du Fonds de développement institutionnel (IDF), s'ils incluent des activités d'investissement; d) des dons au titre du Fonds pour l'environnement mondial et du Protocole de Montréal, pour lesquels la Banque est agent d'exécution; et e) des dons ou prêts fournis par d'autres bailleurs et administrés par la Banque. Le terme « projet » n'englobe pas les programmes d'ajustement financés par des prêts à l'ajustement. « Emprunteur » englobe également, quand la situation l'impose, le garant ou l'agence chargée de l'exécution du projet.

Lors de l'élaboration d'approches pour la réinstallation dans le cadre de projets appuyés par l'Institution, il faudra prendre en compte d'autres politiques pertinentes de la Banque, comprenant la PO 4.01, Évaluation environnementale; la PO 4.04, Habitats naturels; la PO 4.11, Sauvegarder la propriété culturelle dans les projets appuyés par la Banque; la DO 4.20, Populations autochtones.

^{3.} Le terme « personnes déplacées » fait référence aux personnes affectées d'une des manières décrites au par. 3 de cette PO.

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manière constructive et avoir la possibilité de participer à la planification et à la mise en œuvre des programmes de réinstallation.

c) Les personnes déplacées devront être aidées dans leurs efforts d'amélioration, ou du moins de rétablissement, de leurs moyens d'existence et de leur niveau de vie, ceux-ci étant considérés, en terme réels, aux niveaux qui prévalaient au moment de la phase précédant le déplacement ou celle de la mise en œuvre du projet, selon la formule la plus avantageuse⁴.

^{4.} Les populations déplacées relevant du par. 3 b) devront être aidées dans leur effort d'amélioration ou de reconstitution de leurs moyens d'existence, et ce d'une manière préservant la viabilité des parcs et aires protégées.

Note: Les PO et PB 4.12 remplacent à elles deux la DO 4.30, *Réinstallation involontaire*. Ces PO et PB s'appliquent à tous les projets soumis à un Examen du concept du projet effectué le 1^{er} janvier 2002 ou après cette date. Toute question peut être adressée au directeur du Département du développement social (SDV).

Ces politiques ont été préparées à l'intention du personnel de la Banque mondiale et ne traitent pas nécessairement le sujet en question de manière exhaustive.

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Impacts couverts par la politique

- 3. Cette politique couvre les conséquences économiques et sociales directes⁵ qui, tout à la fois, résultent de projets d'investissement financés par la Banque⁶ et sont provoquées par :
 - a) le retrait involontaire7 de terres8 provoquant
 - i) une relocalisation ou une perte d'habitat;
 - ii) une perte de biens ou d'accès à ces biens ; ou
 - une perte de sources de revenu ou de moyens d'existence, que les personnes affectées aient ou non à se déplacer sur un autre site; ou
 - la restriction involontaire de l'accès9 à des parcs définis comme tels juridiquement, et à des aires protégées entraînant des conséquences négatives sur les moyens d'existence des personnes déplacées.
- 4. Cette politique s'applique à toutes les composantes du projet entraînant une réinstallation involontaire, quelle que soit la source de financement de celui-ci. Elle s'applique également aux autres activités donnant lieu à une réinstallation involontaire, qui, aux yeux de la Banque, sont a) directement et significative en relation avec le projet financé par la Banque; b) nécessaires pour atteindre les objectifs tels qu'ils ont été fixés dans le document du projet; et c) réalisées, ou planifiées pour être réalisées, en parallèle avec le projet.
- 5. Les demandes de conseil sur les modalités et le champ d'application de la présente politique devront être adressées au Comité de réinstallation (Resettlement Committee) (voir <u>PB 4.12</u>, par. 7)¹⁰.
- 5. S'il existe des impacts sociaux ou économiques négatifs indirects, l'Emprunteur établira une bonne pratique en entreprenant une évaluation sociale et en mettant en œuvre des mesures pour minimiser et atténuer ces impacts, en visant notamment les pauvres et les groupes vulnérables. D'autres impacts environnementaux, sociaux et économiques ne résultant pas du retrait des terres peuvent être identifiés et traités par le biais d'évaluations environnementales et autres rapports et instruments du projet.
- 6. La présente politique ne s'applique pas aux restrictions d'accès à des ressources naturelles nées de projets communautaires par ex., dans le cas où une communauté utilisant les ressources décide d'en restreindre l'accès à condition qu'une évaluation satisfaisante pour la Banque établisse que le processus communautaire de prise de décision soit approprié et qu'il permette l'identification des mesures propres à atténuer les impacts négatifs, s'il en est, sur les membres vulnérables de la communauté. Cette politique ne couvre pas non plus les réfugiés à la suite de catastrophes naturelles, de conflits armés ou de guerres civiles (voir PO/PB 8.50, Emergency Recovery Assistance).
- Aux fins de cette politique, « involontaire » signifie les actions pouvant être entreprises sans que les personnes déplacées donnent leur consentement en toute connaissance de cause ni qu'elles aient la faculté d'exercer un choix.
- 8. « Terres » inclut tout ce qui pousse ou est édifié de manière permanente, tel que des bâtiments ou des cultures. Cette politique ne s'applique pas aux réglementations sur les ressources naturelles en vigueur à un niveau national ou régional pour encourager leur viabilité, telles que la gestion des bassins versants, la gestion des eaux souterraines, la gestion de la pêche, etc. La politique ne s'applique pas non plus aux conflits, dans le cadre de projets de réforme foncière, entre personnes privées, et ce, bien que la réalisation d'une évaluation sociale et la mise en œuvre de mesures pour minimiser et atténuer les impacts sociaux négatifs, particulièrement ceux affectant les pauvres et les groupes vulnérables, constitue une bonne pratique de la part de l'Emprunteur.
- 9. Aux fins de la présente politique, la restriction involontaire de l'accès couvre les restrictions pesant sur l'utilisation des ressources et qui sont imposées aux populations vivant en dehors du parc ou de l'aire protégée, ou à celles qui continuent à vivre dans le parc ou l'aire protégée pendant ou après l'exécution du projet. Dans les cas où la création de nouveaux parcs ou aires protégées est inhérente au projet, les personnes perdant leurs habitat, terres ou autres éléments d'actif relèvent également du par. 3 a).

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Mesures requises

- 6. Pour traiter les impacts relevant du par. 3 a) de cette politique, l'Emprunteur prépare un plan de réinstallation ou un cadre de politique de réinstallation (voir par. 25-30) qui couvre les éléments suivants :
 - a) Le plan de réinstallation ou le cadre de politique de réinstallation inclut les mesures garantissant que les personnes déplacées sont
 - informées des options qui leur sont ouvertes et des droits se rattachant à la réinstallation;
 - consultées, soumises à plusieurs choix et informées des alternatives réalisables aux plans technique et économique; et
 - iii) pourvues rapidement d'une compensation effective au coût intégral de remplacement¹¹ pour les pertes de biens¹² directement attribuables au projet.
 - b) Si une relocalisation physique figure au nombre des impacts, le plan de réinstallation ou le cadre de politique de réinstallation inclut des mesures garantissant que les personnes déplacées sont
 - pourvues d'une aide (telle que des indemnités de déplacement) pendant la réinstallation ;
 et
 - ii) pourvues de logements ou de terrains à bâtir, ou, selon les exigences posées, de terrains agricoles présentant une combinaison de potentiel productif, d'avantages géographiques et autres facteurs au moins équivalente aux avantages du site antérieur.¹³
 - c) Lorsque cela s'avère nécessaire pour que les objectifs de la politique soient atteints, le plan de réinstallation ou le cadre de politique de réinstallation inclut également des mesures garantissant que les personnes déplacées sont

Le Manuel de réinstallation (Resettlement Sourcebook) (à paraître) donne, au personnel, des conseils de bonne pratique sur cette politique.

^{11. «}Le coût de remplacement» est la méthode d'évaluation des éléments d'actif qui permet de déterminer le montant suffisant pour remplacer les pertes subies et couvrir les coûts de transaction. L'amortissement des équipements et moyens de production ne devra pas être pris en compte lors de l'application de cette méthode d'évaluation (pour une définition plus précise du coût de remplacement, voir annexe A, note de bas de page 1). S'agissant des pertes qu'il est difficile d'évaluer ou de compenser en termes monétaires (l'accès à des services publics, à des clients ou des fournisseurs; ou à la pêche, au pâturage ou zones forestières, par ex.), on tente d'établir un accès à des ressources et sources de revenu équivalentes et culturellement acceptables. Lorsque la législation nationale ne prévoit pas une compensation d'un niveau correspondant au coût intégral de remplacement, la compensation au titre de la législation nationale est complétée par les mesures additionnelles permettant de combler l'écart avec le coût de remplacement en vigueur. Cette aide additionnelle n'entre pas dans le cadre de l'aide à la réinstallation à fournir au titre des autres clauses du par. 6.

^{12.} Si la partie restante du bien pris n'est pas économiquement viable, une compensation et autre forme d'aide à la réinstallation doivent être fournies comme si la totalité de l'actif avait été perdue.

^{13.} La fourniture de biens alternatifs sera assortie des dispositions foncières idoines. Le coût des logements, des terrains à bâtir, des locaux commerciaux, des terrains agricoles de remplacement à fournir peut être déduit de la compensation totale ou partielle payable en indemnisation de l'élément d'actif perdu correspondant.

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- recipiendaires d'une aide après le déplacement, pour une période transitoire d'une durée fondée sur une estimation raisonnable du temps probable nécessaire au rétablissement de leurs moyens d'existence et de leurs revenus¹⁴; et
- ii) pourvues d'une aide au développement qui s'ajouterait aux mesures de compensation décrites au paragraphe 6 a) iii), telles que la viabilisation des terrains, des mécanismes de crédit, la formation ou des créations d'emploi.
- 7. Dans les projets impliquant une restriction involontaire de l'accès à des parcs définis comme tels juridiquement ou à des aires protégées (voir par. 3b)), la nature des restrictions, aussi bien que le type des mesures nécessaires à en atténuer les impacts négatifs, est déterminée, lors de la conception et de l'exécution du projet, avec la participation des personnes déplacées. Dans ces cas-là, l'Emprunteur élabore un cadre fonctionnel acceptable par la Banque, décrivant le processus participatif régissant
 - a) la préparation et la mise en œuvre des composantes spécifiques du projet ;
 - b) la définition des critères d'éligibilité des personnes déplacées ;
 - c) l'identification des mesures à prendre pour aider les personnes déplacées dans leurs efforts d'amélioration, ou du moins de rétablissement, de leurs moyens d'existence, ceux-ci étant considérés à leur juste valeur avec, en accompagnement, le souci de maintenir la viabilité du parc ou de l'aire protégée; et
 - d) la résolution des conflits potentiels impliquant des personnes déplacées.

Le cadre fonctionnel inclut également une description des dispositions prises pour la mise en œuvre et le suivi du processus.

- 8. Pour que les objectifs de cette politique soient atteints, on prêtera une attention particulière aux besoins des groupes vulnérables au sein des populations déplacées, notamment les personnes vivant en deçà du seuil de pauvreté, les travailleurs sans terre, les femmes et les enfants, les populations autochtones ¹⁵, les minorités ethniques et toutes les autres personnes déplacées risquant de ne pas être protégées par la législation nationale relative à la compensation foncière.
- 9. L'expérience de la Banque montre que la réinstallation de populations autochtones disposant de modes de production traditionnels fondés sur la terre est particulièrement complexe et peut avoir des impacts négatifs significatifs sur leur identité et survie culturelle. Pour cette raison, la Banque s'assure que l'Emprunteur a étudié toutes les alternatives réalisables dans la conception du projet permettant d'éviter le déplacement physique de ces groupes. Lorsqu'il n'y a pas d'autre alternative que le déplacement, les stratégies de réinstallation de ces groupes compatibles avec leurs priorités culturelles et préparées en concertation avec eux (voir annexe A, par. 11) sur des terres à vocation agricole sont privilégiées (voir par. 11).
- 10. La mise en œuvre des activités de réinstallation est connexe à l'exécution de la composante investissement du projet pour faire en sorte que le déplacement ou la restriction d'accès n'intervient pas

Un tel appui peut prendre la forme d'emplois temporaires, d'aide alimentaire, de dispositifs de maintien du salaire ou autres mesures similaires.

^{15.} Voir DO 4.20, Populations autochtones.

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avant que les mesures nécessaires à la réinstallation soient en place. En ce qui concerne les impacts relevant du par. 3 a) de cette politique, ces mesures incluent la fourniture, avant que le déplacement n'intervienne, d'une compensation et des autres formes d'assistance requises pour la relocalisation, ainsi que la préparation et l'attribution de terrains de réinstallation assortis des équipements appropriés, là où cela est requis. La prise des terres et des biens qui lui sont attachés, notamment, ne peut se faire qu'après le versement de l'indemnisation et, là où cela s'applique, la fourniture aux personnes déplacées de terrains de réinstallation et d'indemnités de déplacement. Pour ce qui est des impacts relevant du par. 3 b) de cette politique, les mesures d'aide aux personnes déplacées sont mises en œuvre en concordance avec le plan d'action en tant que partie intégrante du projet (voir par. 30).

- 11. Les stratégies de réinstallation sur des terres devront être privilégiées en ce qui concerne des populations déplacées dont les moyens d'existence sont tirés de la terre. Ces stratégies peuvent inclure la réinstallation sur des terres domaniales (voir note de bas de page 1, ci-dessus), ou sur des terrains privés acquis ou achetés en vue de la réinstallation. À chaque fois que des terres de substitution sont proposées, les terrains fournis aux personnes réinstallées doivent afficher une combinaison de potentiel productif, d'avantages géographiques et autres facteurs au moins équivalente aux avantages des terres soustraites. Si les personnes déplacées choisissent une autre option que l'attribution de terres à vocation agricole, si la fourniture de terres porte préjudice à la viabilité d'un parc ou d'une aire protégée¹⁶, ou s'il n'y a pas suffisamment de terres disponibles à un coût raisonnable, il faudra proposer des options non foncières fondées sur des perspectives d'emploi ou de travail indépendant qui s'ajouteront à une indemnisation en espèces pour la terre et autres moyens de production perdus. L'absence de terrains à vocation agricole appropriés doit être prouvée et documentée de manière satisfaisante pour la Banque.
- 12. Le paiement en espèces d'une compensation pour perte de biens est acceptable dans les cas où a) les moyens d'existence étant tirés des ressources foncières, les terres prises par le projet ne représentent qu'une faible fraction 17 de l'actif affecté et le reste de l'actif est économiquement viable ; b) des marchés actifs existent pour les terres, les logements et le travail, les personnes déplacées utilisent de tels marchés et il y a une offre disponible suffisante de terres et d'habitations ; où enfin c) les moyens d'existence ne sont pas fondés sur les ressources foncières. Les niveaux de compensation en espèces devront être suffisants pour financer le remplacement des terrains perdus et autres actifs au coût intégral de remplacement sur les marchés locaux.
- 13. Pour les impacts mentionnés au par. 3 a) de la présente politique, la Banque requiert également ce qui suit :
- a) Les personnes déplacées et leurs communautés, ainsi que les communautés hôtes les accueillant, reçoivent, à temps, , une information pertinente, sont consultées sur les diverses options de réinstallation, et se voient offrir des possibilités de participation à la planification, la mise en œuvre, et le suivi de la réinstallation. Des mécanismes appropriés et accessibles d'expression des doléances sont mis en place pour ces groupes.
- b) Sur les sites de réinstallation, ou dans les communautés hôtes, l'infrastructure et les services publics sont fournis en tant que de besoin, afin d'améliorer, reconstituer, ou maintenir l'accessibilité des personnes déplacées et des communautés hôtes aux services et les niveaux de ceux-ci. Des ressources alternatives ou comparables sont fournies pour compenser la perte d'accès aux ressources

^{16.} Voir PO 4.04, Habitats naturels.

D'une manière générale, ce principe s'applique aux cas où les terres retirées constituent moins de 20% de la zone productive totale.

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communautaires (telles que les zones piscicoles, les zones de pâturage, les ressources énergétiques ou les fourrages).

c) Les formes d'organisation communautaires adaptées aux nouvelles circonstances sont fonction des choix exercés par les personnes déplacées. Dans la mesure du possible, les structures sociales et culturelles existantes des personnes réinstallées, ainsi que des communautés hôtes, sont préservées, et les préférences des personnes réinstallées, pour ce qui est de la relocalisation au sein de communautés et groupes préexistants, sont respectées.

Eligibilité pour recevoir une aide¹⁸

14. Une fois la nécessité d'une réinstallation involontaire reconnue, pour un projet donné, l'Emprunteur conduit un recensement pour identifier les personnes susceptibles d'être affectées par le projet (voir annexe A, par. 6 a)), et ainsi déterminer qui sera éligible pour une aide et par là-même décourager l'arrivée massive de personnes non éligibles. L'Emprunteur met également au point une procédure, acceptable par la Banque, visant à établir les critères d'éligibilité des personnes déplacées aux fins de compensation et autre aide à la réinstallation. La procédure comprend des provisions pour effectuer des consultations de portée significative avec les personnes affectées et les communautés, les autorités locales, et, en tant que de besoin, les Organisations non gouvernementales (ONG) ; et elle spécifie les mécanismes de recours pour le traitement des doléances.

^{18.} Les par. 13-15 ne s'appliquent pas aux impacts couverts par le par. 3 b) de la présente politique. Les critères d'éligibilité des personnes déplacées sous 3 b) sont énoncés dans le cadre fonctionnel (voir par. 7 et 30).

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- 15. Critères d'éligibilité. Les personnes déplacées peuvent appartenir à l'une des trois catégories suivantes :
 - a) les détenteurs d'un droit formel sur les terres (y compris les droits coutumiers et traditionnels reconnus par la législation du pays);
 - celles qui n'ont pas de droit formel sur les terres au moment où le recensement commence, mais qui ont des titres fonciers ou autres — sous réserve que de tels titres soient reconnus par les lois du pays ou puissent l'être dans le cadre d'un processus identifié dans le plan de réinstallation (voir annexe A, par. 7 f)); et¹⁹
 - c) celles qui n'ont ni droit formel ni titres susceptibles d'être reconnus sur les terres qu'elles occupent.
- 16. Les personnes relevant des par. 15 a) et b) reçoivent une compensation pour les terres qu'elles perdent, ainsi que toute autre aide prévue au par.6. Les personnes relevant du par.15 c) reçoivent une aide à la réinstallation²⁰ en lieu et place de la compensation pour les terres qu'elles occupent, et toute autre aide, en tant que de besoin, aux fins d'atteindre les objectifs énoncés dans la présente politique, à la condition qu'elles aient occupé les terres dans la zone du projet avant une date limite fixée par l'Emprunteur et acceptable par la Banque²¹. Les personnes occupant ces zones après la date limite n'ont droit à aucune compensation ni autre forme d'aide à la réinstallation. Toutes les personnes relevant des par.15 a), b), ou c) reçoivent une compensation pour la perte d'éléments d'actif autres que le foncier.

Planification, mise en œuvre et suivi de la réinstallation

- 17. Pour atteindre les objectifs de cette politique, plusieurs outils de planification peuvent être utilisés selon le type de projet :
 - a) un plan de réinstallation, ou un plan succinct de réinstallation, est requis, sauf exception (voir par.25 et annexe A), pour toutes les opérations impliquant une réinstallation involontaire;
 - un cadre de politique de réinstallation est requis, sauf exception, pour les opérations mentionnées aux par. 26-30, susceptibles d'entraîner une réinstallation involontaire (voir annexe A); et
 - un cadre procedural est préparé pour les projets impliquant une restriction d'accès telle que décrite en par.3 b) (voir par.31).
- 18. L'Emprunteur est responsable de la préparation, de la mise en œuvre et du suivi, selon les cas, d'un plan de réinstallation, cadre de politique de réinstallation, ou cadre procedural (les « instruments de

^{19.} De tels titres peuvent provenir d'un détournement de bien, d'une possession permanente de terrains publics sans tentative d'expulsion de la part du gouvernement (autrement dit, avec assentiment tacite du gouvernement), ou de lois et us coutumiers ou traditionnels,

^{20.} L'aide à la réinstallation peut se faire sous forme de foncier, autres éléments d'actif, versement d'espèces, emplois, ainsi de suite, en tant que de besoin.

^{21.} Normalement, cette date limite est la date de début du recensement. Toutefois, cette date limite peut aussi être celle à laquelle la zone de projet a été finalisée, en préalable au recensement, pour autant que l'information sur la délimitation de la zone auprès du public ait été effective et que, par la suite, la diffusion systématique et permanente d'information évite un afflux supplémentaire de personnes.

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réinstallation »), conformément à la présente politique. L'instrument de réinstallation présente une stratégie permettant de réaliser les objectifs de la politique et recouvre tous les aspects de la réinstallation proposée. L'engagement de l'Emprunteur, tout comme sa capacité, à mener à son terme, dans de bonnes conditions, la réinstallation, est un déterminant clé de l'implication de la Banque dans un projet.

- 19. La planification de la réinstallation comprend un examen préalable, un balayage des problèmes clés, le choix de l'instrument de réinstallation et l'information requise pour préparer la (sous-)composante de réinstallation. Le contenu et le niveau de détail des instruments de réinstallation dépendent de l'ampleur et de la complexité de la réinstallation. Pour préparer la composante de réinstallation, l'Emprunteur s'appuie sur les expertises sociale, technique et juridique appropriées, ainsi que sur les organisations communautaires et ONG pertinentes²². L'Emprunteur informe, le plus tôt possible, les personnes susceptibles d'être déplacées des aspects du projet liés à la réinstallation et recueille leurs avis en compte dans la conception du projet.
- 20. Les coûts intégraux des activités de réinstallation nécessaires à la réalisation des objectifs du projet sont inclus dans les coûts totaux du projet. Les coûts de réinstallation, à l'instar des coûts des autres activités du projet, sont considérés comme une charge à déduire des bénéfices économiques procurés par le projet; et tout bénéfice net retiré par les personnes réinstallées (par rapport au scénario « sans-projet ») est ajouté aux flux de bénéfices apportés par le projet. Il n'est pas nécessaire que les composantes de réinstallation ou les opérations autonomes de réinstallation, soient économiquement rentables en ellesmêmes; elles doivent toutefois être réalisées dans un souci de la meilleure utilisation des ressources disponibles et du coût/bénéfice.
- 21. L'Emprunteur s'assure que le Plan d'exécution du projet est en parfaite cohérence avec l'instrument de réinstallation.
- 22. La fourniture à la Banque par l'Emprunteur d'un avant-projet d'instrument de réinstallation conforme à la présente politique ainsi que la mise de cet avant-projet à la disposition, dans un lieu accessible, des personnes déplacées et des ONG locales, sous une forme, d'une manière et dans une langue qui leur soient compréhensibles constitue une condition à l'évaluation de projets impliquant une réinstallation. Dès que la Banque accepte cet instrument comme formant une base adéquate pour l'évaluation du projet, elle le met à disposition du public par le biais de son InfoShop. Dès lors que la Banque a approuvé l'instrument final de réinstallation, elle-même et l'Emprunteur le diffusent à nouveau de la même manière ²³.
- 23. Les obligations de l'Emprunteur de mettre en œuvre l'instrument de reinstallation et d'informer la Banque pour les progrès de sa mise en œuvre sont définis dans les accords juridiques relatifs au projet.
- 24. L'Emprunteur est responsable d'un suivi-évaluation adéquat des activités spécifiées dans l'instrument de réinstallation . La Banque supervise régulièrement l'exécution de la réinstallation afin de

^{22.} Pour les projets à haut risque ou très controversés, ou qui impliquent des activités de réinstallation complexes et d'envergure, l'Emprunteur devra normalement engager un panel consultatif indépendant, comprenant des spécialistes de la réinstallation de stature internationale, afin de le conseiller sur tous les aspects du projet relevant des activités de réinstallation. La taille, le rôle, ainsi que la fréquence des réunions dépendront de la complexité de la réinstallation. Si des panels consultatifs techniques indépendants sont créés en application de la PO 4.01, Évaluation environnementale, le panel de réinstallation peut faire partie du panel d'experts environnemental.

Voir PB 17.50, Diffusion de l'information opérationnelle (à paraître) pour les procédures détaillées de diffusion de l'information.

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déterminer la conformité avec l'instrument de réinstallation. Une fois le projet achevé, l'Emprunteur entreprend une évaluation ex-post pour déterminer si les objectifs de l'instrument de réinstallation ont été atteints. Cette évaluation prend en compte les résultats de l'enquête initiale et ceux du suivi de la réinstallation. Si l'évaluation conclut que les objectifs n'ont pas été pleinement atteints, l'Emprunteur doit proposer des mesures subséquentes qui serviront de base pour la poursuite de la supervision par la Banque, si cette dernière le juge nécessaire. (voir également PB 4.12, par. 16).

Instruments de réinstallation

Plan de réinstallation

25. Un projet de plan de réinstallation conforme à la présente politique est une condition à l'évaluation (voir <u>annexe A</u>, par. 2-21) des projets cités au par. 17 a) ci-dessus²⁴. Toutefois, là où les impacts sur l'ensemble des populations déplacées sont mineurs²⁵, ou bien lorsque moins de 200 personnes sont déplacées, un plan succinct de réinstallation peut faire l'objet d'un accord avec l'Emprunteur (voir <u>annexe A</u>, para 22). Les procédures de diffusion de l'information décrites au par. 22 s'appliquent.

Cadre de politique de réinstallation

- 26. Pour les opérations d'investissement sectorielles susceptibles d'impliquer une réinstallation involontaire, la Banque requiert que l'agence d'exécution du projet effectue un examen initial des sousprojets présentés au financement de la Banque, ceci afin d'assurer leur cohérence avec la présente PO. Pour ces opérations, l'Emprunteur soumet, avant l'évaluation, un cadre de politique de réinstallation conforme à la présente politique (voir annexe A, par. 23-25). Ce cadre comporte, autant que faire se peut, une estimation de la population totale à déplacer, ainsi que les coûts d'ensemble de la réinstallation.
- 27. Pour les opérations conduites par des intermédiaires financiers et impliquant une réinstallation involontaire, la Banque requiert que l'intermédiaire financier (FI) procède à un examen initial des sousprojets présentés au financement de la Banque, dans le but d'assurer leur cohérence avec la présente PO. Pour ces opérations, la Banque exige de l'Emprunteur ou du FI qu'il soumette à la Banque, avant l'évaluation, un cadre de politique de réinstallation se conformant à la présente politique (voir annexe A. par. 23-25). De plus, ce cadre doit inclure une évaluation de la capacité institutionnelle et des procédures de chacun des FI responsables du financement des sous-projets. Lorsque, selon l'appréciation de la Banque, aucune réinstallation n'est envisagée dans les sous-projets susceptibles d'être financés par le FI, un cadre de politique de réinstallation n'est pas requis ; ce sont alors les accords juridiques qui, dans le cas d'un sous-projet donnant lieu à une réinstallation, spécifient l'obligation faite aux FI d'obtenir des sous-Emprunteurs potentiels un plan de réinstallation cohérent avec la présente politique. Pour tout sousprojet impliquant une réinstallation, le plan de réinstallation est fourni pour approbation à la Banque avant que le sous-projet ne soit éligible au financement par la Banque.

^{24.} Il est possible de faire une exception à cette exigence dans des circonstances fortement inhabituelles (comme des opérations d'interventions d'urgence) sous réserve de l'approbation par la Direction de la Banque (voir PB 4.12, par. 8). Dans de tels cas, l'approbation par la Direction doit stipuler un calendrier et un budget de mise en œuvre du plan de réinstallation.

^{25.} Les impacts sont jugés « mineurs » si les personnes affectées ne sont pas déplacées physiquement et/ou si moins de 10% de leurs éléments d'actif sont perdus.

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- 28. Pour les autres projets appuyés par la Banque et comprenant de multiples sous-projets²⁶ susceptibles d'impliquer une réinstallation involontaire, la Banque requiert qu'un projet de plan de réinstallation conforme à la présente politique lui soit soumis avant l'évaluation dudit projet à moins que, en raison de la nature et de la conception du projet ou des sous-projets spécifiques, a) il ne soit impossible de déterminer la zone d'impact des sous-projets, ou b) la zone d'impact ne soit connue, mais sans précision de ses délimitations. Dans de tels cas, l'Emprunteur soumet un cadre de politique de réinstallation cohérent avec la présente politique avant l'évaluation (voir annexe A. par. 23-25). Pour les autres sous-projets ne correspondant pas aux critères ci-dessus, un plan de réinstallation conforme à la présente politique est requis avant évaluation.
- 29. Pour chaque sous-projet inclus dans un projet susceptible d'impliquer une réinstallation, selon les modalités décrites au par. 26, 27, ou 28, la Banque requiert qu'un plan de réinstallation acceptable, ou un plan résumé de réinstallation, cohérent avec les éléments du cadre de politique, lui soit soumis pour approbation avant que le sous-projet ne soit éligible à financement par la Banque.
- 30. Pour les projets décrits aux par. 26-28 ci-dessus, la Banque peut accepter, par écrit, que les plans de réinstallation du sous-projet soient approuvés par l'organisme chargé de l'exécution du projet ou un organisme d'État compétent, ou encore un intermédiaire financier sans examen préalable par la Banque, si cet organisme fait la preuve de ses capacités institutionnelles à examiner les plans de réinstallation et à garantir leur conformité avec cette politique. Toute délégation de pouvoir de cette nature ainsi que les recours appropriés contre l'entité chargée de l'approbation des plans de réinstallation qui seraient jugés non conformes à la politique de la Banque politique sont stipulés dans les accords juridiques du projet. Dans tous les cas, la mise en œuvre des plans de réinstallation fait l'objet d'un examen ex post par la Banque.

Cadre procedural

31. Pour les projets impliquant une restriction d'accès aux termes du par. 3 b) ci-dessus, l'Emprunteur fournit à la Banque, comme condition à l'évaluation, un projet de cadre procedural se conformant aux éléments pertinents de cette politique. De plus, lors de la mise en œuvre du projet et avant que la restriction n'entre en vigueur, l'Emprunteur prépare un plan d'action, acceptable par la Banque, décrivant les mesures particulières à prendre, et les dispositions de leur application, pour aider les personnes déplacées. Le plan d'action pourra prendre la forme d'un plan de gestion des ressources naturelles préparé pour le projet.

Aide apportée à l'Emprunteur

- 32. Pour servir les objectifs de cette politique, la Banque peut, à la demande de l'Emprunteur, appuyer celui-ci et les autres entités concernées en :
 - a) fournissant une assistance pour l'évaluation et le renforcement des politiques, stratégies, cadres juridiques et plans particuliers de réinstallation aux niveaux national, régional ou sectoriel;

Dans l'objectif de ce paragraphe, le terme « sous-projets » inclut les composantes et sous-somposantes.

Manuel opérationnel de la banque mondiale Politiques opérationnelles

PO 4.12 Décembre 2001 Page 12 /12

- finançant une assistance technique visant à renforcer les capacités des organismes chargés de la réinstallation ou des populations affectées pour qu'elles participent plus efficacement aux opérations de réinstallation;
- c) finançant une assistance technique visant à l'élaboration des politiques, stratégies et plans particuliers de réinstallation et à la mise en œuvre, au suivi et à l'évaluation des activités de réinstallation; et
- d) finançant les coûts d'investissement de la réinstallation.
- 33. La Banque peut financer soit une composante de l'investissement principal entraînant un déplacement et imposant une réinstallation, soit un projet autonome de réinstallation avec les conditionnalités croisées adéquates, développé et mis en œuvre en parallèle avec l'investissement provoquant le déplacement. La Banque peut financer la réinstallation même si elle ne finance pas l'investissement principal qui rend la réinstallation nécessaire.
- 34. La Banque ne fera aucun decaissement pour le paiement des compensations en espèces et de toute autre forme d'assistance payée en espèces ou encore pour couvrir le coût d'acquisition des terre pour les besoins de la réinstallation (y compris la compensation pour l'acquisition des terres pour les besoins du projet). La Banque peut toutefois financer le coût d'amélioration des terres associées aux activités de réinstallation.

Appendix 8. List of Interviewees

People met	title	contacts
Eric ATANA Bevelo	Director General of Madagascar Energy Company (MEC)	
Francio	Head of Unit	033 62 604 93
FARARANO Désiré	Chairman of fokontany Ampasimpotsy	033 89 365 19
Robert RANAIVO	First Deputy of the Municipality of East Ranomafana	033 13 837 77
LIVA Pascaline	Accountant in the Ranomafana Is Common	033 82 627 31
DAMOUR Josiane	President of the association of growers referred to MAMPIARAKA Vohitranivona	034 15 979 54
Bruno Maurice JOMALAHY	Secretary Treasurer and Accountant within the Municipality of Vohitranivona	033 05 096 37
Emmanuel RANDRIAMASY	growers association's president referred to MAVITRIKA Ambodifaho	
Pierre LESABOTSY	President of the association of growers called TANTELY	033 87 222 58
RAVELOMAHAY Lahiniaina Fitiavana	Chief District Brickaville	
ARTHUR Pascal	growers association's THUR Pascal president referred to MAZOTO Sahamorona	
HENINA Soaguette	Treasurer of the association MAZOTO Sahamorona	033 14 092 33
	Member of the association of growers referred to FITIAVANA Morafeno	
SATA Albert	Manager of the BOA Agency Brickaville	020 65 020 10
TINA	Input seller Brickaville	

A CRES

9. Schedule of public consultations Minutes

Elaboration du Cadre de Gestion Environnementale et Sociale, du Plan de Gestion des Pestes et Pesticides, du Cadre Politique de Réinstallation du Projet Ethanol domestique

FITANANA AN-TSORATRA

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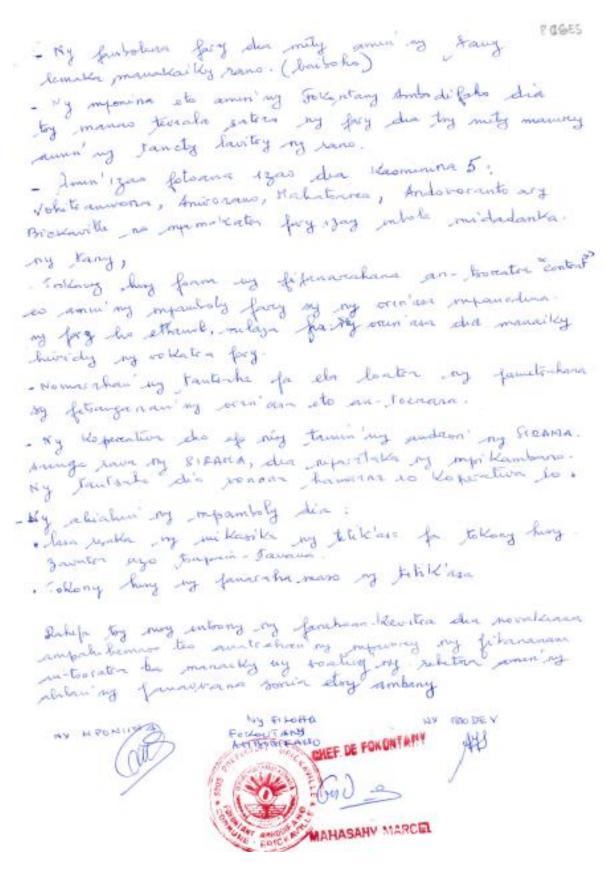
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Kaominina: PARICICATT HE

Distrika: SHICKAVILLE

Faritra: ATSINI BINA NA

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Elaboration du Cadre de Gestion Environnementale et Sociale, du Plan de Gestion des Pestes et Pesticides, du Cadre Politique de Réinstallation du Projet Ethanol domestique

FITANANA AN-TSORATRA

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Objet: Després de Perfectos du Cadre Bouteque de Reinstallation du Projet
Date: (CH 1/4/01/11/16)

Lieu: ANKADIRAND

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3	BARIVELO KONDRO		BUS
ų	LERA		74
3	BERNARD	032 51 403 45 034 4038546	AHL.
6	CLEMENT		45
7	PEFLESTIN		der
8	TSARASOA	033 89 4370	7 00
9	TEODY VICTOR		45
10	GERGETTE		God
M	RASOLOMIAINA PATRIQ		De
12	Josephine		Inplies
13	SALOTSY BERNARD		11/2
14	VAVIROY ALBERTINE		Bull

FICHE DE PRESENCE



Projet: CGESIPGPPICPRETHANOL DOMESTIQUE

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Elaboration du Cadre de Gestion Environnementale et Sociale, du Plan de Gestion des Pestes et Pesticides, du Cadre Politique de Réinstallation du Projet Ethanol domestique

FITANANA AN-TSORATRA

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FICHE DE PRESENCE



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Objet: Flahoreation CGES / PGPP/ape Ethanol domestique

Date : 10/8/1/405/14/5/

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10	RANAIVORANANA STanish	03304 68638	<u></u>
12	PAKOTONU RANDA ANDRE F	0332030643	95
03	Randriambelo Jean Paul		Sms
u	Razandrimovia Rakotondrima		-
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14	Ravelorandro Joseph.	93416113B	and
15	Leomette Bechardine		Ser .
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Appendix 10. Photographic boards of public consultations

Figure 4: Public Consultations in Brickaville - meeting with residents of an Ethanol distillery which is already operational







Figure 5: Public Consultations in Brcikaville - meeting with sugar cane growers





Figure 6: Public Consultations in Foulpointe - Meeting with sugarcane growers



Figure 7: Public Consultations in Tsironanomandidy - meeting with sugarcane growers



Figure 8: Public Consultations in Fenerive East -Meeting with potential ethanol producer



Figure 9: Public Consultations in Antananarivo -Meet with potential users of ethanol





Appendix 11- Request for Consideration for the prior approval of distilleries microphones

	1
Name of entity requiring prior approval for the micro distillery	
Date of submission to the prior approval	
Contact	
Name of contact person	
Email of the contact person	
phone number of the contact person	
Function of the contact person	
General Information on the proposed project	
Proposal for a daily capacity of micro distillery	
Proposal matter s first micro distillery for	
Does the micro distillery necessary funding (or not)?	
The planned budget for the micro distillery	
Does micro distillery will produce part or all of the raw material itself ? (Yes or no)	
Does the entity owns the land for the proposed micro distillery , (Yes or No)	
Does the entity has a letter of intent that gives the right to use the land for the proposed micro distillery? (Yes or no)	
Expected date of the installation of the micro distillery	
Field production of raw materials	
Is land are sufficiently available for the production of raw material? (a ha per 10 liters daily production capacity of micro distillery)	
	L

Do one or more of the land proposed for the production of raw materials or have been forested in the past 10 years ? (Yes or no)	
Do one or more of the land proposed for the production of raw materials is currently used to grow food ? (Yes or no)	
Is a contract or letter of intent signed with the people who own and use the land was signed today? (Yes or no)	
Will people be required to move or relocate as a result of the implementation of the micro distillery or the production of raw materials provided ? (Yes or no)	

Annex 12 - Technical requirements for Micro Distilleries.

This is a technical requirement for micro-distilleries small. For distilleries having a greater capacity, other standards may apply, in which case a special approval must be obtained from the Government of Madagascar and separate standards and approval process should be applied.

Capacity

The standard applied for a micro-distillery is to have the capacity to produce between 150 and 5,000 liters of ethanol per day.

Energy consumption for boiler

Micro-distilleries must use bagasse for the boiler.

The use of electric energy

The micro-distillery must have a capacity to generate electricity from renewable energy. The power generation capacity must be sufficient to meet the average electrical power needs for the distillation process. Other non-renewable energy sources as a generator could be used to cover the additional energy requirements.

Storage ethanol

The micro-distillery must have a storage capacity equivalent to at least a week of production capacity. The ethanol storage capacity must be measured on safe and fireproof storage tanks are closed. Storage tanks must be labeled " storage of fuel ethanol, extremely flammable ".

Ethanol temporarily stored in unsealed containers should not exceed 20% of the daily production capacity

No unsealed ethanol storage must be located within 20 meters of any point of potential combustion, such as a generator or boiler.

The bottle of ethanol must also remain sealed all the time.

Fire extinguisher

Each micro-distillery must have a fire extinguisher.

Waste storage pit

Vinasse should be stored in a tank for drying. Distilleries have the capacity to produce more than 1,000 liters of ethanol per day, must have at least two pits. The pits must be watertight. The pits must have a storage capacity of more than 20 times the daily production capacity of ethanol. The pits should be covered and be designed so that rainwater does not seep it. The biogas digester can be used as storage wells.

Use of vinasse from storage wells

The micro-distillery is encouraged to sell bagasse and stillage from ethanol production as bio-fertilizer to local sugarcane producers. Alternatively, the stillage could be sold to other users or dispersed on land before to ensure that their application would not pose a negative impact on the environment.

Water consumption

The micro-distillery must be designed so that the average water consumption in the production process of ethanol should not exceed 150 liters per liter of ethanol produced. The water should not be discharged until it has reached a temperature below 70 ° C.

Requirement of local components

At least 20% of the value of the micro distillery must be provided by the local components. Micro-distilleries installed after the end of 2016 will have over 30% of the value provided by the local components. Micro-distilleries installed after the end of the year 2018 will be more than 40% of the value provided by the local components.

The micro-distillery must comply with the requirements of the World Bank.

This could include the provision of equipment for the distribution of fertilizer or pesticide or fertilizer distribution to growers of sugar cane in the micro-distillery.

Raw material supply

The micro-distillery must ensure that there is enough land available to increase a sufficient volume of sugar cane required to produce ethanol at full capacity of the distillery. Green Development or CCM (Clean Cooking Madagascar) must confirm that the identified land for sugarcane production has received approval for the production of raw materials. The identified and approved land must at least comply with:

Daily capacity of micro distillery	Ha of land necessary for sugar cane production
200 liter	15
500 liter	40
1,000 liter	80
2,000 liter	160
5,000 liter	400

The quality of the ethanol

Distillery must be able to produce ethanol with a higher alcohol than or equal to 90%. The day distillery that all the ethanol out of the micro-distillery is denatured before sale.

Documentation procedures

The distillery must keep records for all the purchased sugar cane and ethanol sold everything. These records shall be available at any time. These records will be used to ensure that ethanol is sold as cooking fuel, and for the settlement of taxes for ethanol sold.

The micro-distillery must comply with backup program process as described in the Sustainable Code of Conduct.

Sustainable Code of Conduct includes labor standards, safety standards and processes to follow to ensure a sustainable supply of raw materials.

Micro-distilleries that do not meet these standards or the backup process as described herein and in the Sustainable Code of Practice can not obtain certification for the Program.

The exceptions to the obligation to comply with the requirements.

The micro-distillery that does not meet the conditions mentioned above, the Government may request permission despite failure to comply with the requirements of the Project. If such authorization is granted by the Government, Green Development could consider, at its discretion, determine whether the distillery should be certified. This certification could then be granted in the absence of a non-objection of the World Bank within 30 days of the submission of a proposal for certification approval.

The newly installed micro-distilleries, or in the construction phase before the program could get a temporary certification to be admitted to the program, subject to the commitment to adapt the distillery plan within 2 years and to comply with the program requirements.