THE MULTIFUNCTIONAL PLATFORM PROGRAM: EVALUATING THE POTENTIAL FOR SUSTAINABILITY AND SCALE-UP IN SENEGAL

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ACRONYMS

ASER  
Agence Senegalaise d’Electrification Rurale

BMGF  
Bill and Melinda Gates Foundation

CENCOM  
Centre de Commercialisation

ETAAL  
Entreprise de Transformation Agro-alimentaire

GA  
Groupement d’Affaire

GDP  
Gross Domestic Product

MFP  
Multifunctional Platform

NGO  
Non-Governmental Organization

PREM  
Projet Energetique Multisectoriel

PSE  
Plan Senegal Emergent

SME  
Small- and Medium-Enterprise

UNDP  
United Nations Development Program

USAID  
United States Agency for International Development

VB  
Bancs Villageois

WMC  
Women’s Management Committee

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Finally, this study is indebted to the insights of the women of Thiokhol, Tatene Bambara, Bicole, Keur Gaye, and Sobeme, who shared experiences and opinions that were instrumental in informing our understanding of rural development and gender equity in Senegal.
EXECUTIVE SUMMARY

Over the last several years, the National Program for the Multifunctional Platform in Senegal has begun to study and implement scale-up and commercialization strategies designed to advance the program’s reach and sustainability. During the program’s first phase, from 2008 to 2015, multifunctional platforms, which provide rural villages with motive power for basic agro-processing, were installed with the goals of improving women’s livelihoods, expanding access to energy, and improving agricultural productivity. For the second phase of the program, supporting sustainable income-generating activities and more commercially driven enterprises have been added as a major priority. This current study comes as the Government, National Program, UNDP, and Bill and Melinda Gates Foundation, consider options for a scale-up strategy.

Encouragingly, this study found strong value for villages in which an MFP has been installed. Women are the program’s primary beneficiaries, as they formerly bore the burden of the time-consuming and arduous agricultural processing tasks, now completed quickly by the platforms. Labor savings manifest themselves in broad improvements in standard-of-living, health, food diversity, and education for village children.

The benefits of the program, however, are subject to a number of constraints. Most significantly, villages’ economic isolation and low productive capacities mean that impacts tend to be highly localized and do not affect broader economic transformations. This study also found that mechanical breakdowns and the use of diesel render the platforms costly and difficult for villages. Finally, the platforms’ current management structure may limit the involvement of private actors because of its fairly rigid structure.

To assess the most promising strategies for an enterprise-led scale-up, address the program’s constraints, and preserve its impacts, this study makes several targeted recommendations. First, this study outlines a value chain approach focused on the Groupement d’Affaires to enhance its capacity for commercialization. Second, to implement this recommendation, this study uses a segmented approach that reflects the economic diversity of villages in the MFP groups. Because a blanket commercialization strategy would favor certain villages, we propose that different approaches towards commercial sustainability are taken as the program considers its goals going forward.

Third, this study recommends that the program adopt solar-powered or hybrid MFP engines. Not only are solar-powered engines environmentally friendly and more reliable for local users, they are more attractive for new potential investors and partners. This study proposes that these benefits will significantly offset the higher upfront expenses required by solar-powered engines, which will be also be mitigated by the falling price of solar power.

Finally, this study recommends that MFPs leverage other national electrification and development initiatives by considering on-grid platform installations and by collaborating with Senegal’s Rural Electrification Agency, among other strategic partners. The MFP can also ensure “pre-electrification” in remote villages to expand the range of energy services. Once the grid comes, the MFP will then become a client and move to the original model.
proposed e.g. buying electricity from the operator. The recommendations made in this study operate within the Senegal Government’s National Program and UNDP’s mission and objectives and aim to refine and advance them such that the benefits brought to rural communities are made broader and more enduring.

1. **INTRODUCTION**

a. **Study Context & Goals**

As the National Program for the Multifunctional Platform (MFP) winds down its first phase, it is exploring new strategies for improving sustainability and scalability. Given the productive capabilities of the program, which installs agro-processing engines (MFPs) in rural villages, financial sustainability is seen by program officials and donors alike as the necessary driver of a second phase expansion.

This study assesses the commercialization and impact scalability prospects for the second phase of the MFP program. In doing so, the study has explored private financing options, alternative business models, and programmatic changes that may put MFP enterprises on more sustainable financial footing, which in turn will allow the entire program to expand more quickly and effectively. Critically, however, this study has been mindful of the social impacts and potentials of the MFP, which include energy access, women’s empowerment, and food security. Any intervention that increases MFPs’ commercial viability but limits social impact would undermine the program’s fundamental mission and those of its backers. Rather, this study has focused on strategies for enterprise-led development that support the social developments brought about by the MFP.

While this study and its recommendations have taken place in the context of Senegal, the MFP pilot program was launched in Senegal, Burkina Faso, and Mali, and has begun expanding across Africa. As such, this study has made use of the experiences of Burkina Faso and Mali in analyzing Senegal’s MFPs. Additionally, many of this study’s findings and proposals will have direct relevance to programs in other countries and should not be thought of as limited to the context of Senegal.

b. **Methodology**

The findings of this report are the result of desk research, expert interviews, financial data analysis, and a field mission in Senegal. The first part of this study consisted of interviews with officials from the National Program and the UNDP as well as with outside experts in the fields of energy access, development finance, and rural development (see Annex A for a complete list). Next, we undertook a field mission to Senegal, where we met with officials from national and multilateral organizations involved with the MFP program or working in rural development. The field mission also included trips to Thies and Kaolack, where we met with the NGOs and microfinance institutions supporting the program. Finally, and most central to the study, we visited the villages of Thiokhol, Tatene Bambara, Bicole, Keur Gaye, and Sobeme, which are in the Thies, Fatick, and Kaolack regions. These visits to the villages were accompanied by officials from the National Program and its local implementing partner and included meetings with officers on the women’s management...
committee as well as interviews with the platform’s end-users. Following the field mission, we adjusted our initial assumptions and analyses based on MFP enterprise data received from the National Program and from Gradels, the implementing partner for Thies.

c. Structure of this Report

This study is structured as follows:

- Section 2 surveys Senegal’s economic, gender, and energy context, the program’s operational model, and intersections with policy and institutional landscape;
- Section 3 presents this study’s key findings from fieldwork, interviews, desk research, and an analysis of the MFP enterprise model;
- Section 4 outlines the recommendations to be implemented in order to improve the attractiveness of the program to investors and external partners by increasing its commercial potential:
  - Take a value chain approach focusing on the Groupement d’Affaires unit to improve its commercial potential and openness to investment;
  - Pursue a segmentation approach to support MFP commercialization, with different strategies according the villages’ productive capacities.
  - Phase out the use of diesel fuel, replacing it with solar or hybrid-powered engines;
  - Revise the requirement that MFPs are installed off-grid and exploit the synergies between the program and rural electrification;
- Section 5 concludes this study with a review of recommendations and considerations for the future of the program.

2. BACKGROUND

a. Country Context: Development, Gender, and Energy in Senegal

In recent years, Senegal has struggled to overcome several obstacles to its economic stability and developmental progress. Under-exploitation of existing primary resources, weak infrastructure, and a high poverty rate, which exceeds half of the population, have constrained economic performance and are among the major challenges that Senegal’s government is seeking to address.\(^1\) Further, an inhospitable business environment, which ranks it in the bottom fifth of countries on the World Bank’s Doing Business Index, has contributed to relatively weak foreign investment. A high rate of population growth (2.5% per year) has created additional strain on government services and other resources. These factors have contributed to Senegal’s low level of human development and modest GDP growth, which at 4% falls below the 6% average for sub-Saharan Africa.\(^ii\)

Currently, Senegal’s economy is reliant on the service sector, which accounts for 62% of the GDP, and on the growing telecommunications and tourism sectors. Agriculture accounts for only 15% of GDP, although it employs 77% of the country’s labor force with 57% of the population residing in rural areas.\(^iii\) The agricultural sector is vulnerable to unpredictable weather and has been affected by the lack of proper infrastructure, especially related to energy and water, which has significantly constrained Senegal’s agricultural
productivity. Further, Senegal, a Sahelian country, is especially susceptible to climate insecurity. Highly variable annual precipitation already causes significant yield volatility and risk for Senegalese farmers. Climate change, meanwhile, will impact Senegal especially severely, increasing temperatures by 4°C by 2100 and reducing rainfall by 20%.iv

**Women and girls** in Senegal are disproportionately affected by poverty and underdevelopment. The female unemployment rate is approximately 20%, twice the male unemployment rate of 11%. Additionally, female literacy is around 38%, while the male literacy rate is about 62%. Infrastructure shortcomings, including the non-availability of modern clean energy services or agro-processing equipment in rural areas, also have a harmful effect on girls’ education and women’s health. Because of their mothers’ excessive workload, girls are often pressured into abandoning school early on in order to assist with domestic chores. There are approximately 11% more boys in primary schools than girls, and twice as many boys in secondary schools than girls in Senegal.vi

**Energy** is a major driver of development and one of the most effective tools in combating poverty, since it is capable of fueling income-generating activities, especially for women. More than 70% of women are active in the agriculture sector and are generally responsible for goods processing, yet they own only 13.4% of land. Agricultural modernization also lags considerably and the sector is underserved by energy providers.vii As such, women largely rely on rudimentary tools and work in tough physical conditions to carry out agricultural activities.

### b. Overview of the Multifunctional Platform in Senegal

The MFP program seeks to redress many of these challenges and has installed 375 platforms since 2008. This first phase’s primary goals were to improve the living conditions and promote women’s social empowerment by bolstering revenue-generating activities in rural areas and increasing access to basic social provisions, like energy, health, lighting, and appropriate agricultural technology.

For the first phase, platform installation financing relied heavily on subsidies.viii The basic platform and its modules (i.e. cereal miller, dehusker) are fully subsidized, with beneficiaries bearing the cost of the building. Any additional equipment is financed by the women’s groups, either through loans, mobilization of MFP revenues, or private savings. The operations are fully self-financed by the revenues from energy and agro-processing services sold by the MFP.

The next phase of the program is a top priority for the government as reflected in its *Plan Senegal Emergent*. This new strategy focuses more on rural entrepreneurship, with the Government dedicating 20% to 25% of the resources to income-generating activities, compared to 5% during phase 1. With support from the UNDP, the Government projects that 1,000 platforms will be installed by the end of 2018, with 200 commercialization centers (CENCOMs), 50 packaging facilities (ETAALs), 100 SME spaces, 150 community gardens, and 70 Groupement d’Affaires (GAs)—in bundles of 10 MFPs each. GA is an organizational structure bundling MFP villages in a particular region. Through CENCOM
and ETAAL, the GAs intend to improve processing and access to market for their members. Within the CENCOMs, 66 spare parts wholesalers will be integrated to ensure access to necessary equipment for maintenance. Bundling MFPs and integrating them with shared transformation and sales points is designed to bolster enterprises’ efficiency and value-added. Nevertheless, the subsidy remains the heart of this new phase with the packaging and sales buildings (ETAAL and CENCOM) being so far fully subsidized. This phase will also increase focus on the underserved regions (see Annex B). ix

c. Policy and Institutional Context

The MFP program is at the crossroads of multiple policy streams, making it the heart of a complex ecosystem. With impacts and dependencies on energy, entrepreneurship, water, gender, and agriculture, among other policy arenas, the MFP is embedded within a wide array of related development issues (see Figure 1). Our analysis focuses primarily on energy, agriculture, gender, and small and medium enterprises (SMEs)—policy areas critical for the expansion of the MFP program and with potential for fruitful partnerships across the different institutions.

Figure 1: Policy Ecosystem for the MFP

![Policy Ecosystem for the MFP](image_url)
The *Plan Senegal Emergent* (PSE) is a comprehensive policy package released by the Senegalese government, which replaces the National Strategy for Economic and Social Development 2013-2017. The PSE is an umbrella policy that sets out priorities to make Senegal a middle-income country by 2035. A number of top financing priorities in the PSE are critical for the development and expansion of the MFP, including energy, agriculture, and access to water. These ambitions leverage existing policies and programs, which are outlined in detail in Annex C. At the crossroads of these policies, the MFP program has been identified as a top priority within the PSE.

Energy is a critical sector for the economic growth of Senegal. Key components of the energy policy are to expand electrification to 60% of rural areas by 2017 and to increase access to clean energy services. These objectives will be achieved through the development of renewable energies, the use of clean fuel by households, the densification and extension of the grid, and the creation of new economic activities.

Increasing agricultural exports and developing agri-business in Senegal is another key goal of the PSE. The short-term agricultural strategy from 2014 to 2018 focuses on structuring the Shea value chain and implementing 150 to 200 projects to support smallholder farmers through communal farms called *Domaines Agricoles Communautaires*. These projects will focus on diversifying sources of revenues through production of high value-added products and on increasing the productivity. Overall, the plan aims to promote synergies between smallholders and agri-businesses, with smallholder farmers organized around larger market operators through a value chain financing approach. This strategy is likely to have positive effects on the demand for MFP services and help integrate the MFP into agricultural value chains.

A third set of goals relevant to the MFP are to reach 98% access to drinkable water and 70% access to sanitation systems in rural areas by 2017. If the sanitation networks component of the MFP is scaled, it will leverage this ambitious target and benefit from synergies with government programs. Finally, the PSE advocates for the integration of gender as a crosscutting policy in all policy streams to further promote the autonomy of women. This goal of gender mainstreaming is in line with the MFP’s strategy to empower women through increasing economic opportunities and improving livelihoods.

Within this policy and institutional landscape, the MFP program currently partners with and leverages many stakeholders, including government bodies, private actors, and donors. These stakeholders are mapped in Figure 2, which illustrates public, private, and multilateral stakeholders in terms of their respective centrality to the MFP program and their ability to affect policy related to the MFP. In designing the scale-up strategy, the relative influence and importance of stakeholders have been taken into account.
3. FINDINGS & ANALYSIS

a. Key Findings—Benefits

The field mission to MFP villages and review of enterprise-level data found many broad-based positive benefits following the deployment of MFPs. These effects are largely highly localized, as MFP enterprise production is generally used by those living in villages nearby each platform. Nevertheless, for village residents, the platform can have profound standard-of-living effects.

Time & Labor Savings

Most notable among these benefits is the time and labor savings afforded by the platform, which was reported universally by our end-user interviewees. Several women reported that agricultural processing tasks formerly taking as many as six hours may now be completed in a number of minutes. Our interview data indicates that the women used the largest portions of these time-savings for additional rest and childcare. Extra sleep and rest and the alleviation of difficult physical labor constitute major standard-of-living improvements in their own right and generally bring about health and education benefits. Women in the villages of Bicole and Sobeme, for example, discussed having less-strained backs and
softer hands as a result of being freed from manual grinding work. Similarly, the localization of processing means that women do not have to carry agriculture products long distances to remote processors. This travel formerly required women to carry huge masses on their heads, which damaged hearing and caused chronic headaches, symptoms that women report are less common with the MFP in place. The indirect effects on education have been realized by women choosing to spend more of their time caring for children and requiring less help from children with chores and labor after MFP installations.

**New Agricultural Activities**

Diversified agricultural production is a second major use of freed-up labor in MFP villages through community and women’s fruit and vegetables gardens. In Bicole, for instance, a community garden established by the MFP implementing partner has attracted significant enthusiasm from village women, who now devote several hours to cultivating the garden per day. Such gardens expand access to income generating activities, broaden access to nutritional diets, increase total agricultural production and food diversification, and build resilience during the lean season.

**Community Engagement**

The community engagement fostered by MFP activities and their complementing gardens has increased village-wide pride and program buy-in. In most villages, both men and women are actively engaged in the MFP, contributing funds for repairs and trips to markets. This engagement has also linked villages with the program’s implementing partners, who are highly responsive to village needs and have launched innovative initiatives including the community gardens.

Finally, the MFP shows considerable potential to complement and advance other rural development initiatives. In Tatene Bambara, the platform has served as an anchor for an extensive irrigation system and lighting network. Such experience illustrates the platform’s ability to support other electrification efforts through the provision of power infrastructure to villages.

**b. Key Findings—Constraints**

Despite these gains, our study identified several constraints on the welfare-improving and commercial potentials of MFPs. These constraints may hinder MFP functionality at both operational and commercial levels. It is important to note that the extent to which an MFP enterprise is affected by different constraints varies greatly depending on platforms’ location-specific characteristics—a finding that will inform our program segmentation recommendation.

**Limited Access to Markets**
Of the recurring constraints on MFP functionality, economic isolation is the most endemic. The lack of local integration with regional markets is common across rural areas and not necessarily ameliorated by the installation of an MFP. As a result, nearly all of the MFP outputs are consumed within the village and typically within the producing household, according to our field interviews. Further, the sale of agricultural products transformed by MFPs in regional markets is largely limited to millet and other grains. Yields of other crops are typically retained by families—which could be a result of food insecurity, small surpluses, and difficulty accessing regional marketplaces.

**Mechanical Issues**

Machinery and equipment present a second set of limitations on the impact of an MFP. Engine breakdowns are relatively frequent, requiring repairs as often as every few months in some cases, and replacement every two to three years, on average. Repairing the engines is expensive, and may partially decapitalize the entire village, undoing gains made by the platform. Additionally, the process of finding and hiring repair services is time-consuming and difficult to navigate.

In regard to the mechanical problems, operating costs related to fuel cost and engine maintenance are worryingly high for some villages. A standard MFP operating at an average of 20-25 hours per week will consume fuel that costs a minimum of 30,000 CFA. In turn, villagers have to make occasionally lengthy trips to towns selling diesel, a significant time and monetary cost. High operating costs, together with costly maintenance procedures, seriously impinge on MFP profitability. This will limit the program’s major goals of expanding agricultural production and facilitating local entrepreneurship.

**Access to Finance**

Local entrepreneurship is also constrained by the lack of access to enterprise-level capital. While all MFP villages have access to savings accounts and microloans through bancs villageois (BV), small village-managed funds, it was found that microfinance institutions have not made larger loans for purchasing agricultural equipment available to members of the communities. At the same time, our interviews with users found a generally low level of demand for credit to start enterprises. As such, expansions of rural entrepreneurship have not been a significant effect of MFP installation.

**Uneven Awareness & Benefits**

There appears to be an uneven level of benefits among women in the communities. While Women’s Management Committee members are overwhelmingly upbeat about the platform and its effects on village life, its impact on the lives of other women—members of the women’s association, but not management committee—seems far less significant. This could be the result both of different levels of engagement with and knowledge of the platform between the two groups, and the fact that direct income from the MFP goes primarily to women on the Management Committee. While the women who are not on the
Management Committee benefit from access to MFP functions, most villages had some grinding or other processing technology already, moderating the impact of the MFP.

**Competing Impact Priorities**

Finally, our interviews with both experts and users of the MFP indicate there are competing priorities in achieving the program’s goals. Despite the fact that the Government has a clear vision for the MFP as a tool for local industrialization, the fact that the MFP program sits at the intersection of many areas of development policy obscures the ultimate objective. Indeed, the program has multiple goals, including women’s empowerment, expanding energy access, bolstering rural livelihoods, creating income generating activities and agriculture sector strengthening. This cross-cutting impact is a strength of the MFP. However, the goals are not complementary in all cases and may contradict each other. The program’s current focus on strategies for greater commercialization and financial sustainability do not necessarily lend themselves to the platform’s alternative promise of Bottom of Pyramid development. While not inherently contradictory, a highly commercial strategy would tend to focus only on more affluent villages and entrepreneurs, but might risk leaving out the MFPs with more subsistence-level activities. The prospects of catalyzing a bankable level of enterprise development in poorer, more isolated areas, meanwhile, are far smaller. This does not mean that the program should not invest in less-advantaged areas. Rather, goals should not be thought of as homogenous for all platforms but as a transformative ladder starting from basic livelihood improvement to spillover effect on small enterprise development and access to market. Indeed, villages across Senegal have different capacities and aspirations for industrial and entrepreneurial transformation.

c. Operational Analysis

The Enterprise-Customer (E-C) framework is a business-level analytical tool that is used to analyze the MFP enterprise’s features from the perspectives of the local enterprise and the customers. With this tool, it is possible to get an overview of the strengths and weaknesses of the different aspects of the MFP program (see Figure 3).

On the *enterprise side*, it is referring to the characteristics of the MFP enterprise in the village, including:

- **Technology**: the platform itself (diesel engine, cereal grinding mills, de-huskers, oil presses, battery charger, joinery, and carpentry tools) and how easy and reliable it is to operate, how appropriate it is to the tasks, and its affordability;
- **Entrepreneur**: existence, ability, and dedication of the “champion” of the project;
- **Services** that the entrepreneur and enterprise need to succeed, including business development, feasibility studies, legal aid, technical advising, and repair;
- **Finance**: how well the enterprise is financed, including debt, equity, subsidies, grants and microfinance.
On the *customer side* are the people purchasing services (grinding, milling, husking, battery charging, etc.):  

- **Demand** for the products and services provided by the MFP;  
- **Knowledge** of consumers about the technology and its benefits;  
- **Services**: availability of repairs, training, and warranties on goods;  
- **Finance**: how the end-users finance their purchase, including through savings, existing income, incremental income, and micro-loans.

Each component has been given a preliminary ranking (low, medium, high) based on fieldwork and desk research, according to the attractiveness of the feature for potential investors. This analysis feeds into the recommendations by identifying potential areas of the MFP model that could be enhanced in order to increase the commercial viability of the MFP and to attract private financing.

The E-C framework’s findings underpin this study’s recommendations, which are discussed below. Those aspects of the enterprise model rated as low to medium, as is the case with customer and enterprise finance, and enterprise technology, are the focuses of recommendations designed to support them. Similarly, strong features of the model, for example enterprise support and customer demand, are leveraged in this study’s proposed strategies. As such, this framework, together with the findings discussed above, structures the logic and content of the following recommendations.
Figure 3: Enterprise-Customer Framework

- **Technology:** Low-Medium
  Diesel motor can be costly to operate with volatile diesel prices. There is the opportunity to power MFPs with solar or biogas, however this is not yet available in Senegal. According to the 2011 SPA Capstone Report, some machines will only operate for 7 days a year due to breakdowns or awaiting repairs. Has optional extras such as alternator, miller, dehusker and peanut press, which is beneficial for diversifying products and services but can add complications for maintenance. Further, electricity generation and water irrigation is not yet widely available in Senegal.

- **Entrepreneur:** Low-Medium
  The Women’s Management Committee (WMC) is the appointed entrepreneur, which can work very well in villages where they are motivated, less so when they are not. WMC lack flexibility in how they operate the MFP. There are plans to further develop GAs which may enable mutual resources and increase the negotiating power of the WMC with commercial banks and producer associations as they scale up their production. This could either strengthen or weaken the entrepreneurial component of the MFP.

- **Support:** Medium
  There appears to be a lot of support from CAC for training/capacity building for any technical, financial or management issues. However, there are significant issues around the supply of parts.

- **Finance:** Low-Medium
  Up to 60% of start-up are subsidized by the UNDP/BMGF. All operational expenses are self-financed by the MFP. Some WMCs also have access to microfinance and village bank arrangements through organizations such as Caurie Microfinance who partner with the MFP program.

- **Demand:** High
  Demand for MFP processed products is high, as energy, agricultural-processing and water access is either absent or located a long way from the village. The presence of the MFP reduces the opportunity cost for the consumer, which strengthens demand for its services.

- **Knowledge:** High
  Women from within the MFP village and surrounding villages were aware of the MFP and its benefits, including the time saved and health benefits compared to manual processing.

- **Support:** N/A
  There are women who operate the machine so that the women who bring the grains don’t necessarily need to know how it works.

- **Finance:** Low
  Customers pay a small fee for service, but there is little end-user finance available (this access is dependent on the region).
4. **RECOMMENDATIONS**

In order to maximize the potential of the MFP program to attract partners and scale-up, this study recommends a strategic approach, outlined in Figure 4 below, addressing two key challenges:

- the triple bottom line (financial/social/environmental) concerns of the many investors, donors, and partners; and
- the scalability objective of the Senegalese government and UNDP.

As demonstrated below our four recommendations are geared to address these two objectives in a comprehensive and articulated way.

**Figure 4: Study Recommendations based on Key Objectives**

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<tr>
<th>Recs</th>
<th>Objectives</th>
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<tbody>
<tr>
<td>1</td>
<td>Using the GA as the key structure to improve MFP commercial potential</td>
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<tr>
<td>2</td>
<td>Segment the MFP to take into account their capacities and commercial potential</td>
</tr>
<tr>
<td>3</td>
<td>Phase out the use of diesel</td>
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<tr>
<td>4</td>
<td>Remove the grid connection criteria</td>
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**Financial**
- Streamlined and transparent structure to attract investors
- Increase overall surplus to be commercialized
- Reduce operational cost (fuel and maintenance) and increase reliability and capacity of the MFP
- Improve capacity while being mindful of constraints
- Develop local market for renewables
- Larger set of potential communities
- Sustainable agricultural practices
- Decrease harmful Co2 emissions/ Senegal fossil fuel dependency

**Scale**
- Limit subsidies through guarantee fund
- Attract donors with different set of objectives (BoP/private focus)
- Attract larger set of donors/investors reluctant to support diesel use
- Leverage rural electrification strategy
a. Recommendation 1: Using the GA as the key structure to improve MFP commercial potential

The GA is the key structure for the MFP scalability strategy. By bundling up to 10 local MFPs together, the GA provides villages with the opportunity to advance their participation in value chains by improving the packaging of their products at ETAALs and gaining access to market through CENCOMs. This recommendation suggests making the GA the key pivot stakeholder to bridge the gap between MFP communities and the market by linking them to quality buyers and agro-input suppliers. MFP villages could benefit from a streamlined GA structure that could enable access to cheaper capital and tools for increased yields, higher quality management and access to larger markets.

The GA is the best-positioned unit to serve as a financing channel for individual MFPs. As such, this study recommends conceptualizing the GA as a holding company providing specific services (e.g. packaging, commercialization, spare parts) to the MFP for a fee. To do so, the shareholding structure must be streamlined and the subsidy level limited.

Streamlining the GA management structure

Currently, the differentiated shareholding structure of ETAALs and CENCOMs complicates the financial flows between MFPs and GAs (see Figure 5a).\textsuperscript{xvii} In order to attract commercial financing, and impact investors at a later stage, the overall organization of the GA should be simplified to make it easily understood by external partners and to encourage private investors (see Figure 5b). A clear structure with a single manager (the GA) is critical to ensure scale up and commercial potential. Interviews with the GA in Thies confirmed that strong and clear leadership at the GA level is the driver for expansion and creation of income generating activities.

Figure 5a: Current GA shareholding structure
Under this model, each MFP producing a surplus will sell to the GA. The GA will then manage packaging through ETAAL and commercialization through CENCOM and redistribute part of the cash flows to the MFPs at the end of the year, reserving a share for maintenance or the purchase of common new productive units such as shea or juice processors. To ensure social benefits remain in line with the program objectives, part of the net revenue will be distributed monthly to the women working at the ETAAL.

**Limiting the subsidies for GA structures (ETAAL, CENCOM, equipment)**

It is also necessary to reduce the subsidy level to ensure the GA can be an attractive structure for private partners while limiting the program overall cost. Currently, both the ETAAL and the CENCOM are fully subsidized, except for the land provided by the community, and in some cases, additional equipment.

This is due to the fact that the existing ETAAL and CENCOM are first of a kind and the program needed to demonstrate their benefits to be able to expand. Our understanding is that it is not planned that the future ETAAL and CENCOM be subsidized by the program. Indeed, the subsidy could, in the long-term, limit the program in terms of its ability to attract donors and partners, as well as creating a culture in the community of unlimited support from UNDP and NGOs. The GA is meant to make the MFP commercially sustainable, and therefore the subsidies could be more effective if they are targeted and time-bound. Nevertheless, it is important to note that many women’s groups cannot fully mobilize the upfront capital to build the ETAAL and CENCOM and finance the necessary equipment. As such, two mechanisms are proposed to support the next phase of the program.

The National Program could provide a **loan guarantee** to its existing microfinance partners for capital purchases. Local microfinance institutions, Caurie Microfinance and IMCEC, mentioned that they would be open to offer capital loans to the GA if they had an assurance
from the program to cover the risk of default. To ensure that this guarantee does not limit microfinance institutions to conduct proper risk assessment due-diligence, the program should require that the microfinance institutions decrease the required interest rate, to reflect the limited risk.

Alternatively, a guarantee fund could assist in financing equipment providers (see Figure 6). To do so, the GA, with the support of the National Program would work with a financial institution to set up a mechanism whereby the GA can access an equipment lending or rent-to-own model. Under this scheme, the microfinance institutions would offer a loan to equipment providers who would then lease to the GA with an eventual transfer of ownership.

**Figure 6: Illustrative equipment financing at the GA level**

![Figure 6: Illustrative equipment financing at the GA level](image)

**Using the GA as a vehicle to reach markets**

With a streamlined shareholding structure, the GA could be a standalone element of the larger agricultural value chain in Senegal, able to enter in contractual arrangements with private partners. It will also attract corporate foundations financing interested in supporting innovative ideas with potential to scale and triple bottom line approach (see Annex E for more details).

To involve the private sector, it is important to develop models that align with the private sector’s core business strategies by creating win-win partnerships. The value chain interventions laid out below intend to create such models that benefit both the private sector and villages. A growing number of medium and large corporations engage in such models with the aim of achieving core business interests—such as greater competitiveness, increased market share, and improved risk management—while also practicing social responsibility.
Based on the existing value chain diagram below (see Figure 7), this study identified five areas of private sector intervention, outlined in red arrows, to improve the value added of the GA structure:

1. Improving access to quality agricultural inputs
2. Creating and supporting farmers’ groups
3. Purchasing equipment to create higher value products
4. Setting up purchase agreements
5. Supporting local supply of equipment and spare parts

Figure 7: Value chain areas of intervention

The following five value chain interventions are based on a high-level understanding of the MFP and GA position in the value chain based on operational analysis and fieldwork. As outlined in the preliminary millet value chain study (see Annex F), the analysis should be refined based on the specific crops/fruits processed by the GA, to better understand the specific dynamics between the different value chain players and to ensure that the value
chain optimizes production and the potential benefits for low-income communities. This is particularly important given that rice, maize, and millet are reported to be in short supply throughout Senegal.

**Value chain intervention No. 1: Improving access to quality agricultural inputs by engaging input-suppliers and implementing a guarantee fund**

**Current challenge:** Access to seeds and fertilizer is constrained by the low quality and high costs of available seeds, planting materials, and poor access to, and knowledge of, improved inputs in villages.

**Proposed solution:** To redress these constraints, it is proposed that strategic partnerships are formed with input-suppliers. These dealers often provide credit for seeds and fertilizers through either pay-as-you-go or production cycle-tied credit schemes. Input-suppliers may also provide agricultural extension services (agricultural training) to ensure that farmers do well enough to continue buying seeds and fertilizers and repay credit. Risk mitigants are essential in attracting input-suppliers in the low market segments occupied by MFP villages. A guarantee fund created by the program could be a straightforward way to reduce the exposure risk of input-suppliers, and facilitate their involvement in the program.

**Win-win model:** This arrangement offers a guaranteed market to farmers and an incentive to re-use agro-inputs for subsequent seasons. For input-suppliers, this partnership will tap into new underserved market segments, while for MFP users, now inaccessible inputs will become routine.

**Partnerships**

The MFP program should partner with crop producers involved in sustainable supply such as Bayer CropScience. Bayer CropScience manufactures and commercializes products in crop protection and nonagricultural pest control. It also has activities in seeds and plant traits. Two of their programs are particularly relevant to initiate a partnership with the MFP program. First, the “New Revolution in Agriculture” is a company commitment to significantly and sustainably increase agricultural production worldwide. Second, as part of the Grow Africa partnership, Bayer has joined 48 other companies and the G8 nations to form the New Alliance for Food Security and Nutrition.

*See Annex E for a full list and brief description of each potential input supplier.*

**Value chain intervention No. 2: Creating and supporting farmers groups to assist in increasing demand for GA and MFP products and services**

**Current challenge:** There is no formal cooperation between small farmers organizations and the MFP. In addition, in Central Senegal, most farmers are not organized in associations, while it is the case for rice producers in the Northern and Southern regions, according to Matar Sylla of the National Biogas Programme.
**Proposed solution**: Creating farmers’ organizations and cooperatives provide an opportunity to increase the demand for GA and MFP services. These organizations are also critical elements of the value chain to improve farming practices and enhance access to inputs, including seeds and fertilizers. Farmers’ organizations allow for a cohesive unit that can adequately plan, organize, and manage the process of crop production, consolidation, and sale of the agricultural products produced by its members. The GA should be the interlocutor initiating discussions with existing farmer’s associations likely to use MFP agro-processing facilities proposed by the MFP. When no association is present, the local implementing partners of the MFP program could contribute to the structuring by organizing meetings with local farmers at the GA level.

**Win-win model**: Farmer groups are a useful means of meeting the MFP’s goals of increasing smallholder production and commercialization. Creating a formal partnership between farmers’ organization and the GA would ensure sufficient demand for MFP services while improving access to market for small farmers.

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<th>Partnerships</th>
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<tr>
<td>USAID could be a valuable partner of the MFP program in Senegal, particularly to assist in creating these organizations, but also across the value chain interventions. USAID has a value chain development program called Feed the Future that works with farmer associations to develop their rice, corn and millet value chains. USAID organizes farmers and works to connect them to finance and markets. The MFP National Program can work with USAID to become an agro-processing partner.</td>
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**Value chain intervention No. 3: Purchasing equipment to create higher value products**

**Current challenge**: Secondary transformation and packaging are capturing an important share of the agricultural value chain by adding value to the product. While the MFP program has taken steps to provide this service through ETAALs, the potential of ETAALs is yet to be fully exploited.

**Proposed solution**: To ensure that MFP beneficiaries capture a fair share of the agricultural value chain, the GA can purchase necessary equipment (e.g., juice and shea transformation facilities), which could be financed either through commercial loans or through equipment leasing. Marketing the processed products to make them appealing for the end consumers is critical to ensure access to market. Capacity building should improve village capabilities for processing, packaging, and labelling of products.

**Win-win model**: Through this model, the GA could leverage its simplified structure to engage commercial loans, or leasing companies could expand their presence in the agricultural sector by benefiting from risk mitigants offered by the program through a guarantee fund (see Figure 6 above). The GA could then take advantage of high value added equipment to process and package products to a higher quality making them more appealing to end users.

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<th>Partnerships</th>
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National leasing companies could be interested in partnering with the program if the proposed government guarantee fund was to be established. They could partner with the program to lease the equipment (e.g. ETAAL, juice unit) to the GA. Two companies are particularly active in agricultural equipment financing:

- **Locafrique** plans to grow its market presence in agricultural equipment by at least 10% annually. The company had a particular focus on the rice value chain in the Senegal River Valley and the maize value chain in the central region.\(^{xviii}\)
- **Alios Finance** is a West African company that offers a comprehensive range of investment financial solutions, and is growing its leasing business.

**Value chain intervention No. 4: Setting up Purchase Agreements to assist in the commercialization of MFPs**

**Current challenge:** The MFP program faces difficulty in ensuring demand for MFP products, mostly due to the remoteness of villages, small surpluses, limited transportation infrastructure, and inconsistent product quality. This in turn impacts the commercialization of MFP products.

**Proposed solution:** An agreement between the MFP program and a medium and/or large company to buy MFP products could improve access to market and ensure demand. Additionally, the MFP Program could design a partnership where the company also covers the cost of agricultural training, assistance with the initial costs of setting up associations, and other operational costs.

In order for this agreement to work, the following items must be in place:

- Consolidate small farmers (see value chain intervention No.2)
- Make sure that the CENCOM has all the right conditions of a working warehouse where producers’ agricultural products can be safely stored and consolidated for sale to external buyers.
- The MFP must approach companies with a clear business case that includes financial statements, logistics and operational details with the clear benefits for the company and the farmers.

**Win-win model:** For companies that sign purchase contracts, long-term returns could be realized through improved quality, traceability, volume, and reliability of agricultural products and result in greater competitiveness and improved risk management. MFP users could benefit through improved prices, yield, security, market access and farm planning.

**Partnerships**

There is potential for the MFP program to partner with SAB Miller to support demand. SAB Miller supports micro, small and medium enterprises and entrepreneurs to improve livelihoods across the value chain. They currently engage 50,000 smallholder farmers and 68,000 micro-retailers and entrepreneurs worldwide through programs working with small-scale shopkeepers in Africa and Latin America.\(^{xix}\)
Value chain intervention No. 5: Supporting local supply of equipment and spare parts through the development of a local manufacturing unit

**Current challenge:** To respect national procurement rules and benefit from economies of scale, the program has so far procured the basic MFP modules through international bidding procedures. Nevertheless, conversations with local implementing partners evidenced that the Chinese engines procured by the program were more expensive than engines purchased at the local level for replacement. In addition, this procedure is lengthy and cumbersome and delays the timely implementation and expansion of the program.

**Proposed solution:** Structuring a local manufacturing unit for the MFP, and related equipment locally would have a spillover effect on job creations and industrialization of Senegal. As such, local maintenance service providers should be engaged, with the goal of contracting for the provision of maintenance services, resulting in increased working hours and durability for the machine.

**Win-win model:** Local companies involved in manufacturing equipment for MFP and GA structure would benefit from a new sales channel and contribute to job’s creation. In turn, the MFP and GA could have greater and more reliable access to local maintenance.

**Adapting the value chain intervention to the GA commercial scale**

The program’s value chain interventions could be adapted depending on the productive capacity of the GA. This capacity is a function of the agricultural surplus available from the single MFP part of the GA. Under this dynamic GA support strategy, the National Program’s interventions evolve as GAs become more commercial (see Figure 8). A system for determining villages’ commercial potential and aligning strategies with needs is discussed in the following section.
Figure 8: value chain intervention priorities based on GA commercial potential

**Action Items**

- Simplify the GA organizational structure in order to attract public and private partners and investors to assist in the scale up and commercial potential of MFPs.
- Set up a loan guarantee to attract existing microfinance partners for capital purchases through a rent-to-own model.
- Improve access to quality agricultural inputs by partnering with agro-dealers such as Bayer CropScience.
- Support the creation of farmers groups to increase the demand for, and quality of, MFP products.
- Support the purchase of additional agro-processing equipment to create higher value products.
- Create partnerships with companies like SABMiller to put in place purchase agreements for MFP crops.
- Support the development of local enterprises that supply MFP equipment and spare parts.
- Over time, undertake a value chain analysis for each of the crops processed by the MFP.
b. Recommendation 2: Segment Villages According to their Commercial Potential in order to Optimize Scale-up Strategies

To support the GA strategy (discussed in Recommendation 1 above), this study proposes a segmentation of MFP villages according to their current commercial potential. This potential will be evaluated through criteria based on a triple bottom line approach (environmental, social, financial). The criteria matches the framework used by investors and donors to enter into a program (see Table 2).

According to this evaluation, the MFP enterprises will be segmented to allow for tailored strategies to scale-up and allocate resources. This segmentation will enable MFP enterprises to reach their full commercial potential based on their existing capacities.

In addition, this segmentation could be used to attract donors with different objectives and target populations. For instance, donors with a strong commitment towards bottom of the pyramid development could focus mainly on Segment 1 MFP communities, while privately oriented donors may be interested in financing more of Segment 2 MFP communities. This segmentation thus gives a framework for the program to reach out to different partners.

**Segmentation criteria**

The **social indicators** reflect the level of individual and social development in the village according to education level, gender integration, community participation and cohesion. It is understood that if social development in the village is high then the village is more likely to have the capacity to be involved in commercial activities.

The **environmental indicators** are related to a set of environmental, infrastructure and productivity conditions within the village that place it in a higher probability of reaching markets. For example, if the village is near a regional hub, has a high crop yield and is already producing surplus then it is closer to being a Segment 2 village, as it is within reach of markets.

The **financial indicators** relate to each village’s ability to successfully sell and profit from selling MFP processed crops. For example, if nearby villages demand products processed by the MFP and there is an existing farmer’s association, then there is a higher probability that the village could operate the MFP commercially.

Finally, to assess the MFP’s performance, the study proposes key **operational indicators** that evaluate the probability of the MFP running successfully. For example, the presence of maintenance service and a spare parts warehouse increases the probability of functioning hours of the MFP, increasing the probability of being able to meet the volume and quality standards required by the markets.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Weight</th>
<th>Rank</th>
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<tbody>
<tr>
<td>Environmental</td>
<td>25%</td>
<td>H/M/L</td>
</tr>
<tr>
<td>Presence or prospects for alternative sources of electricity</td>
<td>20%</td>
<td>H/M/L</td>
</tr>
<tr>
<td>Crop Yield (compared to national average; surplus)</td>
<td>20%</td>
<td>H/M/L</td>
</tr>
<tr>
<td>Diversity of crops</td>
<td>20%</td>
<td>H/M/L</td>
</tr>
<tr>
<td>Months of drought</td>
<td>5%</td>
<td>H/M/L</td>
</tr>
<tr>
<td>Physical distance to regional hub in km</td>
<td>20%</td>
<td>H/M/L</td>
</tr>
<tr>
<td>Presence of a well/irrigation system</td>
<td>15%</td>
<td>H/M/L</td>
</tr>
<tr>
<td><strong>Social</strong></td>
<td>25%</td>
<td>H/M/L</td>
</tr>
<tr>
<td>Literacy Rate</td>
<td>25%</td>
<td>H/M/L</td>
</tr>
<tr>
<td>Presence of a health center in the village</td>
<td>15%</td>
<td>H/M/L</td>
</tr>
<tr>
<td>Presence of a secondary school</td>
<td>15%</td>
<td>H/M/L</td>
</tr>
<tr>
<td>Rate of individuals sent to school by gender</td>
<td>20%</td>
<td>H/M/L</td>
</tr>
<tr>
<td>Number of organizations/groups within the community</td>
<td>15%</td>
<td>H/M/L</td>
</tr>
<tr>
<td>Presence of community garden</td>
<td>10%</td>
<td>H/M/L</td>
</tr>
<tr>
<td><strong>Financial</strong></td>
<td>25%</td>
<td>H/M/L</td>
</tr>
<tr>
<td>Neighboring population with demand for MFP products</td>
<td>20%</td>
<td>H/M/L</td>
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<tr>
<td>Transportation Logistics (roads/availability of local transportation/costs)</td>
<td>20%</td>
<td>H/M/L</td>
</tr>
<tr>
<td>VBs, MFIs, # of people with loans</td>
<td>20%</td>
<td>H/M/L</td>
</tr>
<tr>
<td>Existing local/regional producer’s association</td>
<td>10%</td>
<td>H/M/L</td>
</tr>
<tr>
<td>Already selling to markets or other commercial activities for women</td>
<td>30%</td>
<td>H/M/L</td>
</tr>
<tr>
<td><strong>Operational</strong></td>
<td>25%</td>
<td>H/M/L</td>
</tr>
<tr>
<td>Availability of maintenance services and spare parts/diesel</td>
<td>30%</td>
<td>H/M/L</td>
</tr>
<tr>
<td>Track record of maintenance (# of breakdowns per year/avg length of breakdown per year)</td>
<td>40%</td>
<td>H/M/L</td>
</tr>
<tr>
<td>Fund available for repairs and maintenance</td>
<td>30%</td>
<td>H/M/L</td>
</tr>
</tbody>
</table>

(H= High, M= Medium, L=Low)

A **baseline survey** of current MFP villages and proposed MFP villages could be undertaken to assign villages a score according to the above criteria (Table 2). The score assigned to a village will inform the strategy for each village, with different approaches for Segment 1 (lower score) and Segment 2 (higher score). By prioritizing assistance according to their current capabilities, villages will receive the appropriate training and tools to ensure they have the capacity to increase their commercial viability by moving to the next segment, with the long-term goal of sustaining fully operational commercial businesses.

Further, a **participatory approach methodology** should be incorporated as part of the process to test the model assumptions. This will minimize the probability of missteps. Even well intentioned ideas and projects often misunderstand key facts about the community or the target population, increasing the probability of project failure. To minimize this, the target population and the larger community should be included in planning from the beginning, giving a voice to staff, members of the villages, and community leaders. This inclusion of key influencers will boost community buy-in, awareness of the benefits the MFP creates, and the efficiency of program implementation.

**Strategy for Segment 1 Villages: Improve agricultural productivity and commercial orientation**

Segment 1 villages are largely subsistence based, with little or no access to local or regional markets, and with either limited or underused access to finance. For Segment 1 villages, the initial focus should be on capacity building, with the goal of progressively moving towards segment 2.
**Capacity building**

Capacity building programs should first focus on basic literacy and farming practices training, with the key goal to boost agricultural productivity and yields in order to increase the surplus that would later be commercialized at GA level.

**Access to finance**

In the extension of financial services to Segment 1 villages, the primary focus of the strategy is to support VB by ensuring women have access to group loans. VBs provide limited loan amounts that are unlikely to be used to create micro-enterprises, but that are essential to progressively improve financial literacy of the women and familiarize them with contract loans.

In order to move toward the stability of a Segment 2 village, in which individuals have access to microfinance loans to launch SMEs, supporting the ease and availability of group loans is a key intermediary in this process.

Ideally, once villages begin to produce a surplus beyond subsistence level, they will eventually be able to make full use of the GA infrastructures (ETAAL and CENCOM), which will boost the production quality and transportability of local products.

**Partnerships**

Implementing partners, like Gradels and Caritas, are the best channels to identify local NGOs involved in rural development. Cultural awareness and local knowledge is critical to ensure the success of capacity building initiatives, so it is not recommended that a national partnership is launched for this type of capacity building.

**Strategy for Segment 2 Villages: Provide capacity building related to entrepreneurship and improve access to SME financial products**

Segment 2 Villages are semi-commercial platforms that already have a surplus of agricultural products and are broadly interested in pursuing commercial activities. Still, many of these platforms operate with limited business skills and face steep challenges in accessing finance and markets. As such, the study develops a strategic approach for incorporating the private sector into the MFP program, such that these commercial-grade platforms become more deeply integrated in agricultural value chains, as identified in Recommendation 1.

**Capacity Building**

Segment 2 villages’ capacity building should focus on building capacity pillars for entrepreneurship. That is improving villages’ knowledge on operational, financial and personal management. In terms of the operation of the MFP, capacity building includes providing training on machine maintenance and continuing capacity building on agricultural productivity: appropriate use of seeds and fertilizer, farming techniques, agricultural best practices, storage and processing. Financial capacity building involves teaching both personal and business financial management including budgeting and costs, revenues and margin concepts. These services may be provided through an entrepreneurship center, where farmers associations and individuals may acquire this knowledge.
**Access to Finance**

There are three important financial products for Segment 2 village’s end-users. The first, lease finance, applies to machinery and additional processing engines - demand for these may rise as a result of increased economic activity through the village due to MFP activity. A pay-to-own model may work in this scenario, where individuals place a down payment followed by a monthly payment with the option to own at the end of the payment period. The second financial product is agricultural insurance, which will reduce the platforms’ and therefore the farmers’ risk and boost their financial security. Lastly, financial products for SMEs should be made available- they help in ensuring businesses reach their growth potential and for facilitating new business start-ups.

It is important to note that the process of successfully extending customer finance down market must include:

- Awareness raising;
- Outreach;
- Training;
- Financial intermediation;
- Financial and marketing coaching activities;
- Tangible benefits to end-users must be set clear from the beginner and communicated.

**Partnerships**

Mentorship programs are a key tool to ensure the dedication and success of entrepreneurs. SEM Fund, a Senegalese NGO operating in Eastern Senegal is launching a model of mentorship especially dedicated to women, which could be replicated by the program through cooperation with a mentor network such as Synapse Center. This center, present in Senegal and supported by USAID, MasterCard Foundation and Ashoka intends to match future entrepreneurs with existing entrepreneurs. It focuses on sustainable agriculture enterprises in which segment 2 MFP could fit.

For lease financing, the MFP program may partner with Locafrique – they already have a lease financing mechanism for farmers working with USAID. For agricultural insurance, the MFP program may partner with CNCAS – they also have a partnership in place with USAID to provide associated farmers with an insurance mechanism that protects them from risk.
Assessing the financial return at the GA level based on the segmentation

In order to limit the program subsidies, it is critical to understand the standalone financial potential of the GA as if it were an independent enterprise. To do so, we have built a financial model taking into account the different segments and how the overall makeup of these within a GA will impact the commercial returns of a GA (see Figure 10 and Annex D for the detailed model and key assumptions).
Under this structure, the study assumes that a Segment 2 MFP village would produce beyond subsistence level (conservatively 10%) and sell its products to an ETAAL with a markup of 40%. After further processing and packaging the products, the ETAAL would then sell the products to the CENCOM with a small mark up to cover its operating costs (target gross margin at ETAAL level is assumed to be 0%). The CENCOM would then sell the products to the end buyers with an important mark-up (50%).

The remaining cash at the GA level would then be distributed between MFP communities, or used to finance additional income generating activities at the GA level.

The National Program could then use this segmentation to assess the consolidated financial return of future GAs based on the mix of segments. It would enable the program to identify the GA with the most competitive advantage and potential to attract investors at a later stage. Table 3 illustrates that the overall GA return depends on the level of subsidy from the program as well as the percentage of subsistence level MFP (Segment 1) within the GA. The shaded area represents the scenario under which the GA overall consolidated financial return would be below 10% (corresponding to the country risk as measured by the spread in Senegalese bond issuance 2011).
Table 3: Consolidated internal rate of returns (IRR) at the GA level depending on the percent of subsistence MFPs and percent of overall subsidy (for illustrative purposes only)

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<tr>
<th>% of MFP in the GA</th>
<th>0%</th>
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<td>0%</td>
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<td>-15%</td>
<td>-14%</td>
<td>-12%</td>
<td>-10%</td>
<td>-8%</td>
<td></td>
</tr>
</tbody>
</table>

### Action Items

- Perform a baseline survey to assist in assigning rankings to each village according to the criteria outlined in Table 2.
- Develop a participatory approach methodology to ensure that the strategy is appropriate for each village.
- Local implementing partners could focus on providing capacity building and access to finance through Bancs Villageois for Segment 1 villages.
- Local implementing partners could focus on increasing the commercial viability of Segment 2 MFP villages by ensuring that entrepreneurs have access to mentors and receive training to improve their financial literacy and business management capabilities.
- Local implementing partners could develop partnerships with Locafrique and CNCAS who can provide Segment 2 villages with access to finance through leases, agricultural insurance and microcredit.
- Continue the monitoring and evaluation of the MFPs in Segment 1 and 2 villages to ensure villages are getting the assistance necessary to progress to either Segment 2, or to become commercially viable without the need for any further assistance.
- When assessing the feasibility of scaling strategy, a financial analysis should be conducted at the GA level to assess its financial return and ability to reach commercial potential.

c. Recommendation 3: Phase Out the use of Diesel by Introducing Solar-Powered MFPs

As highlighted in interviews with MFP owners, diesel fuel makes up one of the MFP’s largest operational costs. Comprising 35% of the MFP operating budget, these costs are driven by high diesel prices and the heavy maintenance requirements of a diesel engine. Further, women have to travel frequently and often long distances to source diesel, budgeting is difficult given high price volatility, and the regular replacement necessary for diesel engines requires high capital expenditures.

With solar photovoltaic costs declining rapidly, solar provides an affordable and clean energy source for the MFP. Mali has recognized this opportunity and has begun to introduce solar-powered MFPs, with six installed in the past year. Their aim is to have 35% of MFPs running on solar by 2019.

Phasing out diesel and switching to solar would increase the attractiveness of the MFP as a sustainable financing option for private investors and reduce the operating costs of the MFP, allowing women to run
more profitable and sustainable enterprises. Not only would this increase the attractiveness of the MFP to private investors, but also to development finance institutions and donors who noted in interviews that they would not provide grants to a program that was solely diesel powered. Further, leveraging new technology to expand energy access and contribute to environmental sustainability is well aligned with the goals of the program and those of existing key stakeholders, including the UNDP and the Gates Foundation.\textsuperscript{xx}

Senegal’s solar market is in its infancy and remains relatively small, likely due to the lack of government incentives for solar business development and deployment. In collaboration with the Senegal Agency for Rural Electrification (ASER), the MFP program has the capability to increase the deployment of solar energy across Senegal. Such an initiative could assist in opening the market by laying the groundwork for further government initiatives in the renewable sector and spurring additional public and private sector participation, which could improve the investment climate for further sustainable infrastructure developments across the country.

The Senegalese government is committed to provide an enabling environment for the solar market to grow but the decree for the Renewable Energy Law allowing tax-free imports of solar equipment is yet to be signed. Tax incentive is probably part of the reason why solar is more widespread in Mali than Senegal.\textsuperscript{xxi} The MFP could also assist the government in reaching its goal of 15% renewable energy in electricity production by 2025.

Opening the renewable energy market would also provide greater entrepreneurial opportunities in rural areas for both small-scale solar distributors and skilled technicians. In Mali, MFP program engineers train women in MFP villages for four months on the functioning and maintenance of the panels and batteries so that they can carry out repairs where necessary. The solar provider also carries out a quarterly inspection to ensure that the electronic equipment is functioning, particularly around the rainy season. Women are responsible for any maintenance costs in the rare event of equipment break down.

While switching to solar, or a solar-diesel hybrid model, may have higher upfront capital costs, long-run benefits will far outweigh the costs of diesel as identified in the pre-feasibility studies carried out by the Mali National MFP Program. Moreover, the upfront capital costs could be reduced through a leasing model approach (discussed in depth in section 4, above), whereby the costs are disbursed over a structured timeframe.

Solar is not the only option, biogas and jatropha oil are other potential energy sources that are been used in countries such as Mali and Burkina Faso.\textsuperscript{xxii} While these are options for the program, issues surrounding supply make solar a more reliable alternative.
Partnerships

- Formalize the partnership with ASER to assist in the transition and ensure the program is aligned with the government’s renewable energy strategy.
- Strengthen the partnership with the National Agency for Renewable Energy, which promotes the use of renewable energy across Senegal.
- Station Energy tailors and implements clean decentralized energy services through three services: turnkey micro-grid, tailored solutions, and advisory. A partnership could support the strategy and equipment for solar MFPs.

Energy companies develop their corporate social responsibility agenda by implementing sustainable energy access programs in developing countries. These corporate foundations could be partners in the roll out of solar-powered MFPs and investors going forward.

- Schneider Electric is one of the biggest suppliers of electrical and power equipment worldwide. The Schneider Electric Energy Access (SEEA) Fund supports SMEs in the development of access to electricity.
- EDF is a French power utility with an international presence. It provides grants and support to decentralized energy services companies in Africa, including Energie Rurale Africaine in Senegal. The minimum beneficiaries should be 10,000 customers, which approximately match the size of a GA market.

Action Items

- A financial analysis should be conducted, comparing the cost of solar to diesel over the life of the MFP, accounting for potential for private finance investments.

- The National Program should work with the Mali National Program, ASER and Station Energy to develop a plan for introducing solar or hybrid MFPs into the Senegal program.

- The UNDP should approach Schneider Electric and EDF to formally gauge the possibility of partnering with them, either in the form of advice or grants, to introduce solar MFPs.

- The UNDP should continue to work to attract partners beyond those identified here for financial, technical, and capacity-building resources.

d. Recommendation 4: Remove the electricity access criteria for new villages applying for an MFP

After careful review of the selection criteria for new MFP installations, this study recommends a reconsideration of the criteria regarding grid access. At present, in order for a village to acquire an MFP, it must not be connected to the grid, nor should it have any prospect of connection in the near future. To ensure social equity between villages, the study acknowledges that villages that are already connected to the grid should not be a priority for the MFP program. Nevertheless, given the ambitious rural electrification plan of the government, a fair share of MFP to be installed will be done in villages that will benefit from grid access in the medium term.
We thus recommend that the grid connection criteria be removed, as the MFP effectively acts to support the Government’s rural electrification strategy. The MFP has the potential to assist the government in reaching its goal of 60% rural electrification by 2017 through productive uses under ASER’s Multi-sector Energy Program (PREM). PREM intends to promote the development of productive electricity projects, such as health centers, schools and agri-business, in rural areas in order to enhance the synergies between energy access and poverty alleviation.

Importantly, the MFP is not an energy access technology and does not replace the need for the grid. Rather, it is primarily an agricultural processing machine that can provide other ancillary services. It can therefore provide an important anchor load for the grid, particularly in the early stages of grid connectivity and can assist the government’s objective to create enterprises once a village is connected to the grid. Further, the MFP provides a temporary energy source for those villages not yet connected, allowing for greater productivity and economic opportunities, as well as health benefits, within those villages.

**Partnerships**

Promoting access to modern energy services is a multi-sectoral policy in Senegal and the MFP fits as a platform to provide motive power, and potential electricity connections for households and other social infrastructures, including health centers and schools.

- As discussed in Section 7, a formal partnership should therefore be established with ASER, in this case so that the MFP can be incorporated into its PREM initiative.
- A stronger partnership with the **Ministry of Energy** is important to allow the MFP to assist in the rural electrification objective.
- A formal partnership should also be established with **PEPAM**, the Ministry of Water’s Rural Drinking Water and Sanitation Program, promote access to clean water by powering pumps.

**Action Items**

- Remove the criteria requiring a village to be a certain distance from the national grid, including the requirement that it must not expect to be connected to the grid in the short term.
- Formalize the partnership between the MFP National Program and ASER.
- Formalize the MFP as a facility under the PREM initiative, for those villages already connected to the grid.
- Formalize the partnership between the MFP National Program and ASER.
5. **Conclusions**

This study was launched to determine the commercialization potential of the multifunctional platform and to recommend a strategy to support this potential in a second phase expansion of the program. After interviews with stakeholders and experts, a field mission to Senegal, and analysis of MFP data, we found a strong case for the social impacts of the MFP, but hyper-localized and underdeveloped commercial effects. The platforms clearly provide villages with important benefits, including time and labor savings, improved health, and better diversification and quality of food. MFP-anchored enterprises, however, do not appear to have taken off substantially and most of the platform’s products stay within the village. Integration with regional markets and viable new enterprises are not major effects of the platform.

To improve understanding of the constraints on MFP commercialization and guide a more enterprise-led expansion strategy, this study employed several analytical tools, including a model value chain and a financial model for village- and group-level MFP operations. Our primary conclusion was the need for platforms to be segmented according to commercial viability. Many subsistence-level MFPs are unlikely to generate commercial-grade surpluses or be viable without initial subsidization. These platforms, however, do create positive social returns and contribute to poverty alleviation. A more commercial approach should therefore focus on MFPs that are more integrated with regional markets and agricultural value chains. This conclusion should inform the national strategy for commercialization and Groupement d’Affaires rollout.

A second major conclusion of this study is the need for a transition to solar or hybrid engines for the MFP. Solar engines will be more reliable and durable than the diesel engines currently used, reduce the fuel cost burden on villages, and be more attractive to private investors interested in environmental protection. Finally, we outline several partnership strategies designed to advance the program’s mission of facilitating comprehensive rural development in Senegal.

The recommendations proposed by this study are to preserve the positive social impacts of the MFP while improving its financial sustainability. Our finding is that these two objectives have the potential to be complementary; if the program is able to remain inclusive and commercial viability translates into more resources available for platform installations across the country. This outcome is not inevitable, however, given that the poorest communities are unlikely to generate high-value surpluses in the near-term and would therefore be excluded from a purely commercial venture. In this way, balancing the platform’s enterprise-led future with its origins in poverty alleviation will be a defining endeavor for the program’s ongoing development and expansion.
## ANNEX A: STAKEHOLDERS’ INTERVIEWS

<table>
<thead>
<tr>
<th>Organization</th>
<th>People interviewed</th>
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<tbody>
<tr>
<td>Africa Business Group</td>
<td>Michael Sudarkasa, CEO</td>
</tr>
<tr>
<td>ASER</td>
<td>Ousmane Fall Sarr, Head of the Studies and Information System Unit</td>
</tr>
<tr>
<td>Carbon Finance</td>
<td>Cathy Diam, Director</td>
</tr>
<tr>
<td>Caritas</td>
<td>Dominique SENE, CEO</td>
</tr>
<tr>
<td>Caurie MicroFinance</td>
<td>Mamadou Lamine Gueye, CEO</td>
</tr>
<tr>
<td></td>
<td>Dorothee Diatta, Administrative and Human Resources Director</td>
</tr>
<tr>
<td>ENDA</td>
<td>Yacine Gueye, Head of Programme</td>
</tr>
<tr>
<td></td>
<td>Emmanuel Seck, Programme Manager</td>
</tr>
<tr>
<td>ESMAP (World Bank)</td>
<td>Awa Seck, Task Team Leader</td>
</tr>
<tr>
<td>GDF SUEZ, Rassembleurs d’Energie</td>
<td>Laure Vincotte - CEO</td>
</tr>
<tr>
<td>Gradels</td>
<td>Mor Lo, Head of Gradels and local team</td>
</tr>
<tr>
<td>IMCEC</td>
<td>Head of Kaolack IMCEC</td>
</tr>
<tr>
<td>MFP Consultant</td>
<td>Andre Damiba, Consultant</td>
</tr>
<tr>
<td>Ministry of Industry</td>
<td>Director of Industrial Development</td>
</tr>
<tr>
<td>Ministry of Energy, Direction of Electricity</td>
<td>Ibrahima Niane, Director of Electricity</td>
</tr>
<tr>
<td>National Biogas Programme</td>
<td>Matar Sylla, Coordinator</td>
</tr>
<tr>
<td>National Coordination Unit</td>
<td>Auguste Turpin – Head of NCU</td>
</tr>
<tr>
<td></td>
<td>Paul Diouf – NCU Coordinator</td>
</tr>
<tr>
<td></td>
<td>Kaolak-based Team</td>
</tr>
<tr>
<td>National MFP Program - Mali</td>
<td>Yaya Sidibe, National coordinator, MFP Mali</td>
</tr>
<tr>
<td>Rural Development Consultant</td>
<td>Hyacynthe Mbengue</td>
</tr>
<tr>
<td>Sab Miller</td>
<td>Diego Molano, Director of Bavaria Foundation, Colombia</td>
</tr>
<tr>
<td>SEM Fund</td>
<td>Constanza Robles, Project Coordinator</td>
</tr>
<tr>
<td>Station Energy</td>
<td>Julien Cot, Head of Projects Senegal</td>
</tr>
<tr>
<td>THECOGAZ – Biogas Plant</td>
<td>Lamine Ndiaye, CEO</td>
</tr>
<tr>
<td>UNDP – PREP and Senegal Office</td>
<td>Boubacar Oualy – Head of Regional UNDP/PREP</td>
</tr>
<tr>
<td></td>
<td>Mathieu Ciowela- Country Director Senegal</td>
</tr>
<tr>
<td></td>
<td>Adama Ly – Team Leader PRSD Senegal</td>
</tr>
<tr>
<td>USAID</td>
<td>Megan Rapp, Investment Officer, Development Credit Authority</td>
</tr>
<tr>
<td></td>
<td>Susan Fine, Mission Director</td>
</tr>
<tr>
<td></td>
<td>Anne Williams, Head of Growth Office Senegal</td>
</tr>
<tr>
<td></td>
<td>Papa Dieye, Senior Agriculture Specialist, Senegal</td>
</tr>
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</table>
## ANNEX B: REGIONAL DISTRIBUTION OF MFPs IN SENEGAL (2014-2018)

<table>
<thead>
<tr>
<th>Zones</th>
<th>2014 Number</th>
<th>% of total</th>
<th>2018 Number</th>
<th>% of total</th>
<th>% increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>South-West</td>
<td>0</td>
<td>-</td>
<td>180</td>
<td>18</td>
<td>-</td>
</tr>
<tr>
<td>South-East</td>
<td>48</td>
<td>13</td>
<td>180</td>
<td>18</td>
<td>275%</td>
</tr>
<tr>
<td>East</td>
<td>84</td>
<td>23</td>
<td>170</td>
<td>17</td>
<td>102%</td>
</tr>
<tr>
<td>Center</td>
<td>95</td>
<td>26</td>
<td>170</td>
<td>17</td>
<td>79%</td>
</tr>
<tr>
<td>Center-West</td>
<td>124</td>
<td>34</td>
<td>160</td>
<td>16</td>
<td>29%</td>
</tr>
<tr>
<td>North</td>
<td>15</td>
<td>4</td>
<td>140</td>
<td>14</td>
<td>833%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>366</strong></td>
<td><strong>100</strong></td>
<td><strong>1000</strong></td>
<td><strong>100</strong></td>
<td><strong>173%</strong></td>
</tr>
</tbody>
</table>
ANNEX C: DETAILED POLICY LANDSCAPE

A dense landscape of programs, government ministries, and donors are currently operating in Senegal and support the PSE ambitions. This section provides an overview of these programs and policies given their critical roles in agricultural, energy, entrepreneurship, and gender sectors.

**Energy policy**

- **ECOWAS** (Economic Community of West African States) regional policy on access to energy services for rural and peri-urban populations in the West African region was formulated in 2005 by ECOWAS and the West African Monetary Union, with the support of the UNDP Regional Programme for Poverty Reduction (UNDP PREP), the French Government, and the Austrian Development Cooperation.\(^1\) The global objective is to ensure access to modern energy services for at least 50% of the population living in rural and peri-urban areas by 2015. One of the three specific investment programmes of the Regional Action focuses on access to motive power services to improve productivity and access to modern social services. The MFP program fits into the latter component and is mentioned in the White Paper as a best practice to be followed and expanded further in the region.

- **The Rural Electrification Development Policy Letter (2004)** intends to broaden access to modern forms of energy in rural areas and to boost productivity and set a target to increase rural electrification rate to 30 percent by 2015.

- **The Energy Sector Development Policy Paper 2012 (LPDSE)** highlights the importance of guaranteeing access to energy for all so as to stimulate economic growth and equitable development. A target of 60% rural electrification by 2017 was set, reflecting the high priority of this policy due do its clear interactions with poverty reduction.

- **Renewables:** If the MFP were to transition to renewable energy sources, this would fit in the Senegalese Government’s commitment to increase renewable energy in the fuel mix. In 2003, the government adopted the National Strategy for the Development of Renewable Energy for Poverty Alleviation, which set a minimum target of 15% renewable-based electricity production by 2025. In 2010, the Renewable Energy Law provided incentives for renewable projects with a reduction of Corporate Income Tax and Value Added Tax from 30 percent and 7 percent, respectively to 0 percent for investors in renewable projects and energy products and services. The National Program on Biogas under the Africa Biogas Partnership Programme was also launched in 2010, to decrease household reliance on traditional biomass.\(^2\) Finally, in July 2013, the ECOWAS Authority of Heads of State and State and Government adopted the ECOWAS Energy Efficiency Policy (EEEP), and the ECOWAS Renewable Energy Policy (EREP). It foresees an estimated 25% of the rural population served by renewable energy powered by mini-grids and stand-alone hybrid systems by 2030.

**Key access to energy programmes**

- **PREM:** the Multi-Sector Energy Programme is one of the components of the Rural Electrification Plan (PASER) set out in the Rural Electrification Development Policy Letter 2004. PREM intends to promote the development of productive electricity projects in rural areas in order to enhance the

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\(^1\) ECOWAS/WAMU White Paper, 2006

\(^2\) International Renewable Energy Agency (IRENA), Senegal Renewables readiness Assessment 2012

synergies between energy access and poverty alleviation. Specifically, health centers, schools and agri-business (including multi-functional platforms and pumping stations) were selected for connection.

- **FER**: the Rural Electrification Fund was created in 2006 as the recipient of all resources dedicated to rural electrification investments in Senegal.
- **PROGEDE**: The Sustainable and Participatory Energy Management Project started its second phase in 2010. It intends to increase the availability of diversified household fuels in a sustainable and gender equitable way in order to contribute to increased income in the communities while protecting the forest eco-system through community-based forest management.
- **PERACOD**: The Programme to Promote Rural Electrification and a Sustainable Supply of Domestic Fuel intends to enhance the access of modern energy services to households. The programme has four main points of focus: energy policy planning, renewables and energy efficiency, fuel supply for households, and rural electrification. At a policy level, PERACOD promotes greater integration of energy services in national development plans and the sector development policies (health, vocational training, and agriculture). At the local level, it ensures that basic energy services are taken into consideration in the creation of local development plans (Plans Locaux de Developpement - PLD).
- **ERSEN** (Electrification Rurale au Sénégal) is one of two projects funded by the PERACOD in which gender mainstreaming has been incorporated. The ERSEN project aims to electrify 50 villages in areas of less than 700 inhabitants in the central and southern parts of Senegal.

**Agriculture policy**

- **Law on agriculture, forestry, and livestock production (LOASP)** was implemented in 2004 and was created in consultation with various stakeholders from rural sectors and civil society. LOASP provides the legal framework for the development of Senegal’s agricultural sector and includes the policies to promote rural entrepreneurship and the modernization of farming techniques. The Ministry of Agriculture and Water is in charge of coordinating and monitoring activities implemented under LOASP.
- **Senegal’s Accelerated Growth Strategy (AGS)** was launched in 2006 and targets agriculture to promote economic development. One of AGS’ main purposes is to double GDP per capita in 15 years with a focus on redistributive policies and the implementation of anti-poverty strategies to reduce inequality.
- **National Strategy for Food Security** has two main objectives: increasing agricultural production in addition to monitoring, prevention, and management of food security crises. The strategy is in conformity with the Poverty Reduction Strategy and the Millennium Development Goals for 2015.
- **African Union’s (AU) Comprehensive Africa Agriculture Development Program (CAADP)** is the AU’s policy framework for agricultural transformation, wealth creation, food security, nutrition, and economic growth. The CAADP intends to further strengthen and complement existing national food security and agricultural plans such as those contained in GOANA (Grand Agricultural Offensive for Food and Abundance) and the Accelerated Growth Strategy.

**Key agriculture programmes**

- **REVA**: the Return to Agriculture Initiative (REVA) was launched in 2006 in response to migration away from the rural sector to promote the development of agricultural infrastructure like rural roads,

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3 De Gouvello and Kumar, OBA in Senegal – Designing Technology-Neutral Concessions for Rural Electrification - The Global Partnership on Output-Based Aid, Note 14, 2007
4 The World Bank, Implementation, Completion, and Result Report (IDA-39810 TF-53937) - World Bank Sustainable Development Department Country Department Africa Region AFCF1, June 21st 2013
wells, and energy access. REVA also provides training, production tools, and equipment with a special focus on women and young farmers.

- **NAIP**: the National Agriculture Investment Plan (NAIP) 2011-2015 is a US$1.5 billion program that actions the options outlined under the Common Agriculture Policy of ECOWAS (ECOWAP) and CAADP (Comprehensive Africa Agriculture Development Program) for current and future agriculture development. Four of its eight objectives relate directly to the MFP targets: increase the production and the productivity of inputs in general, enhance the value of agricultural products through further processing, improve market access for agricultural products, and strengthen research for the generation and transfer of new technologies in production, and processing and marketing.

- **PAFA**: the Agricultural Value Chains Support Project aims to sustainably improve the food security and income of small-scale producers and create remunerative, sustainable jobs in rural communities. It focuses on expanding the access of smallholders and their organizations to effective services and production infrastructure, appropriate technologies, and markets.

- **PADAER**: the Program of Support to Agricultural Development and Rural Entrepreneurship is the extension of PROMER (Promotion of Rural Entrepreneurship), which ended in 2013. This program aims to develop sustainable enterprises in rural areas in the remote regions of Kédougou, Tambacounda, Kolda, and Matam and offer employment opportunities mainly targeted to women and youth. A partnership had been envisaged with the MFP program but did not go through.\(^5\)

### SME and Access to Finance

- **2008 Orientation Law on SMEs** establishes the definitions of SMEs and specifies the levels of public contracts that must be awarded to SMEs.

- **Sectorial Policy for SMEs** is an implementation framework design to include the SMEs in the formal sector. The initiatives outlined in this policy were realized in 2011, when the government, with funding from the African Development Bank, launched its Small and Medium-Sized Enterprises Center. Taken together with broad-based tax reform developed in the same year, SMEs now benefit from a uniform and simplified tax code.

### Gender Policy

- **National Strategy for Equality and Equity in Gender 2005-2015 (NSEEG)** includes as one of its four objectives the participation of women in the economic sector, specifically through improved access to productive means (land and agricultural inputs) and to credit, and through capacity building of entrepreneurial skills.

### Access to clean water programs

- **PEPAM**: the Rural Drinking Water and Sanitation Program aims to secure access to clean drinking water and enhance sanitation in rural Senegal. It fits within the Letter of Sectorial Policy on Hydraulics and Sanitation (LPSHA) from 2005. A partnership has been envisioned with MFP program but did not go through due to institutional bottlenecks.

- **Ecovillage**: a programme that promotes community-based management of natural resources. It involves energy efficiency in lighting, cooking and motive power through the use of renewable

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\(^5\) Interview with a former employee of PROMER
energy. One Ecovillage benefited from the MFP and given that Ecovillage programme is supported by UNDP as well, it could exhibit potential synergies for scale.
ANNEX D: FINANCIAL MODEL

Capital expenditures and operational assumptions have been estimated based on information received from Gradels – mainly based on the operations of the GA of Niotto Donbass. These inputs are indicative only and can be revised when the model is used to implement this study’s recommendations.

See the “Key inputs” sheet in the financial model for more detailed assumptions and user guide.

<table>
<thead>
<tr>
<th>Segment 1 MFP</th>
<th>Amount in CFA</th>
<th>Segment 2 MFP</th>
<th>Amount in CFA</th>
</tr>
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<tbody>
<tr>
<td>Diesel engine</td>
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<td>Diesel engine</td>
<td>556,648</td>
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<tr>
<td>Mill</td>
<td>792,960</td>
<td>Mill</td>
<td>792,960</td>
</tr>
<tr>
<td>Dehusker</td>
<td>755,790</td>
<td>Dehusker</td>
<td>755,790</td>
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<tr>
<td>Building</td>
<td>1,500,000</td>
<td>Building</td>
<td>1,500,000</td>
</tr>
<tr>
<td>Peanut Press</td>
<td></td>
<td></td>
<td>350,000</td>
</tr>
<tr>
<td>Coffee roaster</td>
<td></td>
<td></td>
<td>400,000</td>
</tr>
<tr>
<td>Battery Charger</td>
<td></td>
<td></td>
<td>260,400</td>
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<tr>
<td>ETAAL</td>
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<td></td>
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<tr>
<td>Building</td>
<td>3,275,000</td>
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<table>
<thead>
<tr>
<th>GA activities</th>
<th>Amount in CFA</th>
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<tbody>
<tr>
<td>CENCOM building</td>
<td>3,275,000</td>
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<tr>
<td>Spare parts business</td>
<td>2,500,000</td>
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<td>Juice unit</td>
<td>6,750,000</td>
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<table>
<thead>
<tr>
<th>GA financial flows assumptions</th>
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<tbody>
<tr>
<td>Membership fee (one off)</td>
</tr>
<tr>
<td>Monthly fee</td>
</tr>
<tr>
<td>GA - % distributed to I</td>
</tr>
<tr>
<td>Min cash balance GA</td>
</tr>
</tbody>
</table>
ANNEX E: RECOMMENDED PARTNERS FOR SCALING UP THE MFP IN SENEGAL

Corporate foundations financing

- Livelihoods Fund for Family Farming (Livelihoods 3F) was founded by Mars and Danone. The mission of the Livelihoods Fund is to support the efforts of poor rural communities in developing countries to restore their natural ecosystems, which improves their food security, increases their economic revenues, and improves their livelihoods. Livelihoods 3F aims to invest 120 million euros in the next 10 years to implement projects in Africa, Asia and Latin America. Investments by Livelihoods 3F will have a triple objective: i) Economic: increase both yields and farmers’ incomes ii) Social: empower farmers, especially women, and improve the livelihoods of farming families iii) Environmental: promote responsible farming practices and technologies that sustainably use natural resources to help enhance the resilience of farms, particularly in the face of climate change. It will provide upfront financing and technical support to NGOs and farmers’ organizations that will implement the projects in the field with farming communities.

- MasterCard Foundation Fund for Rural Prosperity will support innovative ideas that have the potential to grow to scale and also have a deep social impact on the lives of rural people living in poverty throughout Sub-Saharan Africa. The Fund will operate under two broad categories. The innovation one ($15 million) will support the development of ideas for new products, services or processes that increase access to finance for the rural poor. The scaling one ($35 million) will help to scale the most promising ideas or pilots that have the potential to drive financial inclusion for smallholder farmers in new geographic areas. Their focus on youth, education, financial inclusion and Africa could make them a potential funder for training centers for financial literacy. Also, their education focus is in line with farmer extension (supply chain).

Agriculture Input suppliers

- The Syngenta Foundation focuses on productivity and the inclusion of farmers in remunerative value chains. The focus is on ‘pre-commercial’ farmers, often in semi-arid areas, who display potential for agricultural growth. The Foundation runs projects in Africa, Asia, and Latin America, and contributes to the agricultural policy debate worldwide. The Foundation invests in sustainable improvements in farm yields, and helps small farmers earn income from their produce. More specifically, in Africa, the Grofin East & West Africa – ASPIRE Fund supports the growth and development of small and medium enterprises in East and West Africa.

- SeedCo is a subsidiary of AICO Africa Limited, which is Africa’s largest proprietary seed breeding, production, processing, and distribution group. Smallholder farmers make up 90% of SeedCo’s market. The company founded in 2008 has its headquarters in Harare, Zimbabwe. SeedCo is part of The Last Mile Alliance (increasing smallholder

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6 www.livelihoods.eu
7 www.frp.org
access to high-quality inputs). It brings together a coalition of commercial partners (providers of inputs, financial services, and insurance), existing agro dealers, foundations, and donors to achieve a unique, cost-effective rural distribution network that supports both commercial success and development impact at scale.

- **Yara International ASA** is a global firm specializing in agricultural products and environmental protection agents. Yara’s Africa Engagement supports two projects. First, the Agricultural Growth Corridors aim to develop underutilized land areas in Africa that have great potential to enhance food production and economic growth. The concept has a public-private partnerships approach, and takes the entire value chain into perspective, aiming to improve efficiency through targeted investments. Second, Yara is engaged in the Grow Africa Partnership. It was convened jointly by the AU, NEPAD and the World Economic Forum in 2011, with an aim to support national strategies for agricultural growth.

**Purchase agreements partners**

- **SAB Miller** is a multinational brewing and beverage company with a developed sustainability strategy with a focus on 5 themes including (1) accelerate growth and social development in value chains, (2) promotion of moderate and responsible drinking, (3) manage water resources, (4) Manage emissions and waste and (5) Support responsible use of land. AB Miller supports micro, small and medium enterprises and entrepreneurs. They are expanding programs to improve livelihoods across the value chain. The ‘Eagle Project’ in Uganda is SABMiller Africa’s most established smallholder sourcing program, demonstrating the commercial, economic and wider social benefits of an effective, inclusive value chain.

- **Heineken International** is a Dutch brewing company. Heineken’s sustainability strategy includes (1) Protect Water Resources, (2) Reduce CO2 emissions, (3) Sustainable Sourcing and (4) Advocating responsible alcohol consumption. Local sourcing is a key part of Heineken’s partner for growth strategy and supporting the communities in which they operate. To help financially empower farmers and their communities, they have set an ambitious target to source 60% of our agricultural raw materials locally by 2020. In 2013, they launched the Community Revenue Enhancement through Agricultural Technology Extension (CREATE) program to accelerate sourcing initiatives. The CREATE initiative in Sierra Leone started in 2013. One of the project’s primary objectives is to increase the income of at least 2,000 farmers and their families engaged in sorghum cultivation. Another goal is to improve the quality and quantity of the sorghum being produced, as we aim to produce more than 1,000 tons of sorghum per year.
MILLET VALUE CHAIN IN SENEGAL
Senegal: characteristics

- 14.1 million people
  - 58% of population live in rural areas.
  - 60% of this rural population derives its livelihood from agriculture.
- Geographically diverse area with wide range of climates and growing conditions
- 46.7% of the population is under the poverty line

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In Senegal, agriculture represents 17.3% of GDP.
- Agriculture employs around 75% of the working population.
- Groundnuts, cotton, gum arabic and sugarcane are the primary cash crops. Millet, corn, sorghum and rice are the main food crops.
- Two main crops are groundnut: 40% of cultivated land followed by cotton production: 33%.
- Senegal’s agriculture productivity is low compared to other countries in West Africa.
Millet

- Millet is small seeded grass, grown as a cereal crop or grain for fodder and human food.
- Important crop in semi-arid tropics of Africa with 97% of millet production in developing countries.
- Not only adapted to poor, droughty, and infertile soils, but it is also more reliable under these conditions than most other grain crops.
- Millet, like sorghum is predominantly starchy. The protein content is comparable to that of wheat and maize. Millet is also relatively rich in iron and phosphorus.
- The bran layers of millets are good sources of B-complex vitamins. However, millets also feature high fiber content and poor digestibility of nutrients, which severely limits its value in nutrition and influence consumer acceptability.
- Millet varieties:
  - Pearl millet: the most cultivated millet
  - Fox tail millet: 2nd most cultivated
  - Proso millet: 3rd most cultivated
  - Finger millet: 4th most cultivated

Millet – A staple crop for the Senegal

- Among cereals, millet ranks 6th in world area production behind wheat, maize, rice, barley and sorghum. In sub-Saharan Africa it is the 3rd most widely grown crop.
- **Current production does not meet current demand.** Rice, maize, and processed millet are all reported in short supply throughout Senegal because production and productivity are not enough to meet the existing demand.
- More than fonio, corn or sorghum, millet is the principle alternative to rice in Senegal because it is cheap, nutritious, widely cultivated and part of the traditional diet.
Rationale: Relevance of this value chain

Growth
- Spurs rural industrial development and promotes growth through the diverse industries derived from the crop: animal feed and human consumption.

Poverty Reduction
- Millet’s hardy nature ensures reliable harvests in drought conditions and unfertile soils particular to the Sahel region in Senegal
- Increases food security for poor and rural farmers.
- Small processors – mostly women

The role of SMEs
- Plays a key role in income generation for producers, processors and traders.
- Millet production provides employment and entrepreneurship.

Senegal Millet Production

Production vulnerable to seasons (drought)

Source: FAO
Yield of Senegal Millet Production (Ton/Ha)

Production vulnerable to seasons (drought)

Source: FAO

Millet in Senegal – area harvested, production and yield growth rates

All indicators have had negative growth rates – millet production does not show a very good picture in Senegal Year 2011

- Area harvested: -1.10%
- Production: -6.75%
- Yield: 5.71%

Source: FAO
Millet top producers by country

Countries delivering the 5 highest yields

<table>
<thead>
<tr>
<th>Country</th>
<th>Yield (Hg/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>30k</td>
</tr>
<tr>
<td>Jordan</td>
<td>25k</td>
</tr>
<tr>
<td>Croatia</td>
<td>20k</td>
</tr>
<tr>
<td>Uzbekistan</td>
<td>15k</td>
</tr>
<tr>
<td>Switzerland</td>
<td>10k</td>
</tr>
</tbody>
</table>

Top 5 millet seed producers

<table>
<thead>
<tr>
<th>Country</th>
<th>Seed (Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>400k</td>
</tr>
<tr>
<td>Niger</td>
<td>300k</td>
</tr>
<tr>
<td>Nigeria</td>
<td>200k</td>
</tr>
<tr>
<td>Mali</td>
<td>100k</td>
</tr>
<tr>
<td>China</td>
<td>50k</td>
</tr>
</tbody>
</table>

Senegal is not part of the highest yields nor on the top 5 millet producers

Source: FAO

International competitors and Senegal’s share in World Production

- Millet: Approximately 36 million MT of millet are produced annually. India and Nigeria are the world’s largest producers.

Senegal is the 15th largest producer (2% of top producers) in the world and the 8th in the region, behind Niger, Nigeria, Mali, Burkina Faso, Uganda, Ethiopia and Chad.

- Africa produces 56% of the world output, of which 99.9% is produced in sub-Saharan Africa. The top world producers are India, followed by Nigeria, Niger and Mali.

Millet production share per country - Top producers

- India: 42%
- China: 8%
- Nigeria: 23%
- Niger: 13%
- Senegal: 10%
- Tanzania, United Republic Of: 2%
- Mali: 2%
The Millet value chain in Senegal

A qualitative analysis of the domestic millet markets – greatest potential lies in animal fodder without forgetting millet plays an important role in food security.

Strengths:
- Fresh Human consumption – staple crop means consistent demand
- Dried human consumption – international market has a potential to be used for a diverse array of food stuffs/additives.
- Animal fodder – Commercial animal production is a growing industry and millet is sought after as a caloric supplement for feeding pigs, poultry and goats.

Weaknesses:
- Fresh human consumption: Staple crop means consistent demand, so is there really room for growth in volume or in the price of millet. Inferior good.
- Dried Human consumption: Use in traditional dishes means unlikely to grow or change drastically from traditional dishes to dried human consumption.
- Animal Feed: Foreign competitors produce millet for less making it difficult for domestic producers to compete on price.

Opportunities:
- Fresh human consumption: Leverage reputation as a nutritious hardy plant. Market as an inexpensive alternative to other cereals.
- Animal feed: Build ties with national and international animal farmers to create purchase contracts. Work on getting more millet as part of the fodder mix.

Threats:
- Fresh Human consumption: Higher quality or lesser price for imports from other countries not just for millet but for substitute cereals.
- Dried Human consumption: Substitute cereals.
- Animal feed: Substitute supplements, higher quality, less expensive imports from Asia.
Major Constraints

- Overall low current technology (mechanization is a challenge especially in comparison to countries like India and China).
- Poor access to seeds and fertilizer.
- Mostly subsistence production remains.
- Small scale farmers are liable to fast perishability of fresh roots and therefore economic loss.
- Tied to season, drought, environment
- Senegal is not a major seed producer
- Costs of production remain high – high transportation costs. Especially when compared to other countries (India and China)
- Lack of bargaining power of farmers due to lack of organization

Senegal: Millet production and market flow map

Source: USAID and FewaNet
Competitive Strategy: How

- Introduction of improved technologies for small scale producers and farmers
- Implementation of Farmer Cooperatives.
- Establishment of Microfinance institutions relationships to finance equipment purchases (lease financing, crop insurance and value chain finance)
- Assistance in acquiring technology and improved seeds
- Public private partnerships (Ministry of Agriculture, USDA AND IFDA heavily involved in millet value chain in Senegal.
- Cost/risk sharing partnerships with producer networks, consolidators and processors)
- Contract sales arrangement promotes orderly marketing of crops that relieves farmers from pressure to sell fast for cash and that establishes early price benchmarks.

Competitive Strategy: Market

<table>
<thead>
<tr>
<th>Product Market target:</th>
<th>Short to medium term:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresh Millet and Animal fodder millet</td>
<td>For Fresh millet: human consumption focus on Senegal markets – strengthen and increase supply for central region.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Medium term:</th>
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<tbody>
<tr>
<td>For Fresh millet: human consumption focus on expanding supply to meet unmet demand in the major deficit region of north Senegal.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Long-term:</th>
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<tbody>
<tr>
<td>For Fresh millet: human consumption focus on expanding supply to meet unmet demand in Mauritania – major deficit country that imports millet from neighboring countries.</td>
</tr>
</tbody>
</table>

Short Term for animal fodder focus on market creation
- Creation of clients both farmers and companies. Focus on company market to create potential partnerships.
Upgrading Recommendations

**Process Upgrading**
- Increased access of mechanization of millet planting techniques to reduce costs of labor and overall costs of production.
- Increase access to technological improvements in processing millet to increase the efficiency, quality and overall production.

**Product Upgrading**
- Improved seed varieties
  - Increases the overall output.
  - Higher quality seeds also produce better quality millet and millet with higher nutritional value (food security).

**Functional Upgrading**
- Technical assistance training programs
  - Rural farmers learn planting, processing and packaging techniques.
  - This allows farmers to participate in more of the value chain.
  - This provides greater streams of income.

**Channel Upgrading**
- Export Regionally
  - Once other recommendations have been implemented, explore opportunities for moving millet from the central region of Senegal to the “major deficit” region in the north Senegal market flow map.

**OVERALL**
- This will increase the potential production of fresh millet for human consumption and millet for animal fodder meeting internal demand and pushing out imports.

*Business Enabling Environment – ensure adequate and appropriate financing is available to make processing upgrades, lobby municipal and regional governments for improved transportation between rural and urban areas.*
NOTES

5 Central Intelligence Agency
7 Gueye.
9 Ibid, 50.
10 Following the bi-annual Poverty Reduction Strategy Papers submitted to the International Monetary Fund.
11 Republic of Senegal, Stratégie nationale de développement économique et social 2013-17 (Dakar, 2012).
14 Ibid, 82.
15 One village visited during the field mission said that they made two trips a week to the nearest regional center to buy diesel, while another made the trip every second day, spending CFA30,000 a time.
16 In this case, the enterprise is defined as the MFP and the Women’s Management Committee (WMC).
17 For ETAALs, the GA owns 25%, village women’s association owns 25%, and 50% goes to the women’s employees; CENCOMs are owned 100% by the GA.
19 For example, in Tanzania, the program aims to increase the local production of barley by providing support and education for smallholder farmers. In 2010, the program signed agreements with ten organized groups consisting of approximately 170 smallholder farmers from the Southern Highlands region – in total the company has signed contracts with over 500 farmers. The company organizes training and networking days for farmers from around the region, to enhance their agricultural capability through exhibitions of cultivation techniques and demonstrations from the company’s agricultural experts.
21 In 2010, the Senegal Government passed the Renewable Energy Law, which provides incentives for renewable projects through a reduction of corporate income tax and VAT to 0% for investors in renewable projects and energy products and services. However the government is yet to sign the decree that enforces this Law.
22 Damiba, at the end of 2013, Burkina Faso and Mali have successfully piloted Jatropha Oil and solar power to 40 MFPs. Six hybrid biogas/diesel MFPs are being implemented in Mali, which is expected to result in a 45% fuel cost saving.