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Matthew Fielding,¹ Marion Davis,⁵ Nina Weitz,¹ Ival Cummings-John,³
Amanda Hickey,² Francis X. Johnson,⁴ Jacqueline Senyagwa,⁴
Lidia Martinez⁷ and Miaojie Sun⁶

¹ Stockholm Environment Institute, Stockholm Centre

² MRP Candidate, Cornell University

³ SEI Research Consultant – October 2013 to November 2014

⁴ Stockholm Environment Institute, Africa Centre

⁵ Stockholm Environment Institute, US Centre

⁶ Stockholm Environment Institute, Asia Centre

⁷ SEI Research Consultant – September and October 2014

Stockholm Environment Institute
Linnégatan 87D, Box 24218
104 51 Stockholm
Sweden
Tel: +46 8 30 80 44
Web: www.sei-international.org

Director of Communications: Robert Watt
Layout/graphics: Richard Clay
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Cover Photo: Equipment from Addax Bioenergy Sierra Leone's Farmer Development Services programme in one of the villages in the Makeni Project area.

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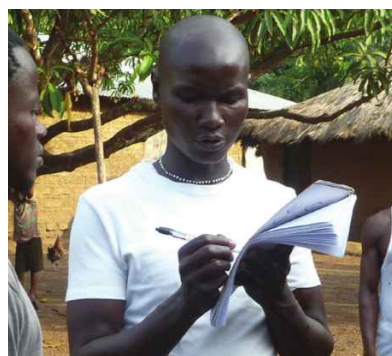
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DEDICATION

This report is dedicated to the memory of our colleague Darlington Kamara, who was part of our field research team. He died from Ebola on 25 December in Magbenteh, Sierra Leone. He was 32. In the preparation of this report he has been in our thoughts, as have the many others we met during our research who have been affected by the Ebola outbreak.



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FOREWORD

Conditions on the ground can sometimes change faster than those in business or development can adapt. This report is based on field research conducted in 2013 and 2014, with follow-up research and analysis conducted in late 2014 and the first months of 2015. We shared a draft with Addax Bioenergy Sierra Leone, the developer of the project, for fact-checking, and we were completing revisions when the company issued this announcement:¹

Over the next six months, AOG, as main shareholder, and Addax Bioenergy SA have decided to downscale their pioneering sugarcane bioethanol operation in Makeni, Sierra Leone, and to conduct a review of all options for the future.

Since its inception in 2008, this Greenfield project, run by AOG subsidiary Addax Bioenergy, has had to overcome a number of unforeseeable events. These have had a significant impact on the timeframe, costs and revenues initially planned. They include the Ebola outbreak in May 2014, which not only has had a terrible human toll on the country, but has also led to substantial delays as most of Addax Bioenergy's contractors declared "force majeure" and left the site.

Taking advantage of the naturally-low level of activity during the rainy season when no revenues are earned, costs will be reduced and operations downscaled. The number of expatriate consultants will be reduced. At the same time, most local employees will be maintained and assets kept in good working order.

The review process will explore all options for the operation's future. AOG and Addax Bioenergy intend to work closely with H.E. President of Sierra Leone and his government to find the right way forward for the operation and for the country.

It is too early to know how this process will unfold, or to judge its implications for Sierra Leone and its strategy of promoting direct foreign investment as a key driver of development. Where relevant, we have made small updates to the report; we will also continue to monitor the situation, and follow up with additional research and analysis in the coming months.

EXECUTIVE SUMMARY

Bioenergy investment is on the rise in sub-Saharan Africa. Global production of liquid biofuels has more than quadrupled in the past decade, driven by renewable energy targets and biofuel blending requirements in the EU, the US and other markets. Although Africa's role in biofuels markets to date has been small – under 1% in 2014 – interest in sub-Saharan Africa as a supplier is growing rapidly. Many foreign companies have acquired large tracts of land for biofuel crop plantations. Sugarcane has drawn particular attention, as it is a commercially proven, tropical bioenergy crop with significant potential in much of the region.

Welcoming governments add to the appeal; foreign direct investment – a record 80 billion USD in 2014 – is crucial to African economies, and bioenergy is seen as a way to attract FDI, boost exports and drive rural development. From 2006 to 2011, bioethanol production in Africa nearly doubled, to 135 million litres – about 60% of it for export.

Agricultural-based bioenergy investments can bring large infusions of capital, infrastructure and technology into rural areas. In most of rural Africa, small-scale farming still predominates, and these projects are often the communities' first encounter with large-scale agro-industry. The projects can thus bring rapid changes, including new jobs, economic growth and development, but also increased pressure on natural resources that are crucial to local livelihoods, particularly land and water.

This study examines the Makeni Project, developed by Addax Bioenergy Sierra Leone (ABSL), as a window into the complex dynamics of bioenergy and agricultural investment in sub-Saharan Africa. ABSL has said it wants the Makeni Project to be “a benchmark for sustainable investment in Africa”, and it has secured funding from six development finance institutions (DFIs). In 2013, the project was the first in Africa to be certified by the Roundtable on Sustainable Biomaterials.

This report places the Makeni Project in the context of Sierra Leone's development challenges and strategies to address them. It is based on in-depth field research in communities within and outside the project area, as well as interviews with ABSL staff, policy-makers, development agencies and experts, and a review of key documents. We look at the project through the lens of “rural transformation” – the notion that eradicating

poverty and achieving sustainable development requires a transformation of rural spaces, economies and societies that empowers rural people.

The Makeni Project and Sierra Leone's development strategies

Sierra Leone has most recently been devastated by the Ebola outbreak, but hardship is nothing new to the country. The civil war of 1991–2002 cost some 70,000 lives, destroyed property and infrastructure, internally displaced about half the population, and drove away many skilled professionals. Sierra Leone has recovered significantly since then, but it remains very much a Least Developed Country (LDC), with more than half its people living on less than 1.25 USD per day (PPP) in 2010. Governance is another key challenge; although several democratic elections have been held, corruption is endemic, and the public sector is plagued by low wages, poor infrastructure and low-capacity personnel.

Yet Sierra Leone is rich in natural resources, which it is using to “kick-start” economic growth. The mining sector is rapidly expanding and is expected to contribute 30% to GDP in 2017, but it provides less than 3% of formal employment. Agriculture, meanwhile, employs about 70% of the labour force and accounted for about 42% of GDP in 2013, but productivity is very low. Sierra Leone has made it a priority to foster rural development by supporting the commercialization of small-scale farming and, at the same time, working to attract large-scale foreign investments.

The 400 million EUR Makeni Project is the largest agricultural investment ever made in Sierra Leone. ABSL has developed a roughly 10,000 ha sugarcane estate, plus a distillery expected to produce about 85,000 m³ of ethanol per year for export to the EU. The plant will also produce electricity, including 15 MW to be fed into the national grid. Construction of the distillery and power plant was completed in 2014, and full production capacity is expected to be reached in 2017.

ABSL has signed 50-year leases on the land for the estate with the chiefdoms and the landowners, agreeing to pay 8.90 USD per ha per year, with half going to the landowners and the remainder to the District Council, the chiefdom and the national



The FDP field outside Madoro, prepared for cultivation by ABSL

government. Landowners who agree to sign direct agreements with ABSL get another 3.46 USD per ha. In addition, ABSL compensated the communities affected by the project for any loss of livelihoods and assets, at replacement costs.

ABSL developed a comprehensive social and environmental management programme as well. Its centrepiece is the Farmer Development Programme, which involves setting up a community field for each village that leased land to the company, to produce enough rice for the entire community. ABSL ploughs and prepares the fields and provides inputs, and the communities maintain the fields and harvest the rice. In 2013, ABSL also started a pilot vegetable garden programme under the FDP.

As part of the FDP, about 2,000 people have also gone through the Farmer Field and Life Schools, a 30-week programme that teaches better farming practices as well as health, nutrition, sanitation, money management and other “life skills”. In 2013, ABSL added the Farmer Development Services (FDS), providing low-cost ploughing and other services. In addition, ABSL has a plan to directly support community development through several initiatives, and it has provided bicycles, health centres and hand-washing stations, and built some wells and boreholes in communities.

The Makeni Project has also become a major employer, with 3,455 workers as of December 2014, 46% of them in permanent positions (the rest are short-term or seasonal). Despite high interest among local residents, however, a lack of necessary job skills has inhibited local hiring. ABSL’s original plans also included a support scheme for outgrowers – local farmers who would produce sugarcane on their own

fields and sell it to ABSL – but logistical challenges have kept ABSL from moving forward.

Field research findings

Loosely following the “sustainable livelihoods” approach, we examined the different types of capital that underpin rural households’ livelihoods – natural resources, skills, social capital, infrastructure, financial resources – and how the Makeni Project is affecting them. We focused on a sample of six villages in the project area, and three outside it. In each village, we surveyed all households: 327 in total in November 2013, and 331 in April 2014. We also applied several rapid rural appraisal techniques, including community resource maps, seasonal calendars, impact diagrams and focus groups. A planned third round of field research, in September 2014, was cancelled due to the Ebola outbreak.

We found high levels of poverty, with a 62% likelihood of households living on less than 0.50 USD/day, 90% relying at least in part on rainfed subsistence agriculture for their livelihoods. Almost all reported food shortages in August, and many also faced shortages in June, September, and sometimes other months. Water access issues are widespread, particularly in the dry season, and water quality is a major concern.

Infrastructure in the area is very poor. The lack of roads makes it difficult to take goods to market, travel to work, or access supplies and services. Energy infrastructure is nearly non-existent, and 99% of households said they cook mostly with firewood. Although 78% of households with children aged 6–13 said they were attending school, many said they struggle to cover the school fees. Government

resources are concentrated in Freetown, with very limited capacity – or visibility – at the local level.

We identified four key change processes occurring in the project area:

Changes in access to and use of natural resources:

By leasing land in these communities, ABSL has directly affected the availability and use of land and other natural resources in the project area. To the extent that the land leased was actively under cultivation, farmers have had to find new places to grow their crops, and prepare their fields. The FDP has introduced high-productivity rice cultivation, and the vegetable gardens have helped diversify diets and provided new crops to sell. Some farmers expressed concern about their ability to sustain these benefits after “graduating” from the FDP; it is unclear how well the FDS will fill the gap. Concerns were also raised about the loss of fruit trees and other perennial plantings, and about reduced access to fuelwood.

Changes in infrastructure: ABSL has developed a significant amount of infrastructure, including not only the plant, pivots and supporting infrastructure, but also roads – an estimated 440 km as of June 2014 – though not all villages are connected to them. Many new houses have been built (79 in the project villages between October 2013 and April 2014, a 37% increase), and existing homes are being upgraded as well. New small commercial buildings and restaurants are also being added.

New income sources and transition to wage labour:

For many people, ABSL offered the first opportunity to engage in formal wage labour, and 38% of households in the project villages had at least one member receiving some income from employment with ABSL. Wage labour can pose challenges for subsistence farmers, however, as the jobs for which they qualify are likely to be seasonal and may coincide with the rice planting and harvesting seasons. Notably, almost all the jobs are going to men, likely for cultural reasons; as of December 2014, women’s share of ABSL employment was 10%.

Demographic changes: There has been an influx of migrants seeking employment with ABSL, in both the project and control villages. The newcomers have different needs, and along with households renting out rooms, restaurants and shops are opening up to cater to this market. However, some community members noted increased competition for food and water, as well as price inflation.



Charcoal (in bags) and mangoes for sale in Moyembarai, a village outside the Makeni Project area.

Increasing development benefits from agro-industrial FDI

The government of Sierra Leone, development finance institutions, and rural communities went into the Makeni Project with very high expectations. But our research suggests that while the project has brought benefits to the region, the potential for rural transformation has not yet been fully realized. For example, although the FDP has succeeded at producing large quantities of rice to offset any crop losses due to the land concessions, local buy-in has varied significantly, and it is uncertain how well these farmers will do after they “graduate” from the FDP.

Another risk that needs to be addressed is that labour scarcity during the growing season will contribute to food insecurity. Given the demographic changes in the region, it is crucial to ensure that there is adequate labour and organization to produce enough food to meet increasing demand. Moreover, if inflation and lack of access to markets reduce workers’ buying and selling power, their families could end up poorer than before. The impact of ABSL employment appears to be large enough to warrant active engagement by the public sector and civil society to help the communities to adjust.



Sugarcane in bloom along the side of a road built by ABSL.

There is also a need to narrow the gap between ABSL's labour needs and the skills and capacities available in local communities. This requires collaboration between the public sector, development partners and NGOs to assess the range of capacities that ABSL expects its workers to have, and to set up structures to build those capacities. ABSL's plan to develop an outgrower scheme, currently on hold, could also make a significant difference for local livelihoods.

More broadly, the Makeni Project highlights the challenges of relying on FDI as a means to advancing development goals, especially in countries with limited resources and substantial needs, such as Sierra Leone. Foreign investors can make a real impact, but they cannot replace the public sector. In fact, without an enabling policy environment and supporting public-sector investments, the transformative potential of private-sector investments will be diminished.

Roads are a good example of this problem. They are a public good, normally built and maintained by the government. ABSL has built roads to support its own operations, and in the process provided vital infrastructure for local communities, but the government has done nothing to fill any gaps – even where building as little as 50 metres of road could transform a village's prospects by linking to an ABSL-built road.

It is possible that Sierra Leone's public institutions do not yet have the capacity to keep up with the rapid pace of ABSL's activities, in which case development partners and NGOs should step in to help. Another, more worrisome possibility is that ABSL's presence has

actually led government agencies – and even NGOs – to curtail their own activities in the area, on the assumption that ABSL will now cover local needs. If this is the case, corrective action is needed. Policy-makers may also want to take precautions to ensure this does not happen around other foreign investments.

Finally, the Makeni Project's potential to expand modern energy access in the region should be carefully explored. Options might include building a mini-grid to connect local communities to the ABSL power plant, and selling some of the ethanol locally, to fuel new, clean cookstoves. It is also worth considering whether there is a viable domestic market in Sierra Leone for ethanol for transport, to reduce dependency on imported oil products.

Conclusion

Sierra Leone has worked to attract FDI as a key development strategy, and has highlighted bioenergy as a priority sector for its potential to advance rural development. Yet one of the most important lessons from bioenergy projects around the world is that good governance is crucial to achieving sustainable development benefits, and to ensuring that the rural poor share in those benefits and are not harmed. Our research suggests that Sierra Leone's institutions are not yet up to that task. Strengthening governance needs to be a priority, with particular attention to regulatory structures, technical know-how, and effective coordination among key agencies.

The Sierra Leone government also lacks the capacity and resources to supplement ABSL's investments in the Makeni region and fill crucial gaps. By more actively engaging with ABSL, however – and with other project developers – it could start to identify opportunities that are now being missed, and seek support from international organizations, donors, development partners and/or NGOs to pursue them. The development finance institutions have a particularly important role to play in this regard.

In closing, we must stress that this report is a snapshot in time of a project that continues to evolve, in communities undergoing rapid change. We intend to continue our work with the Makeni Project, and want to return to Sierra Leone to discuss our findings with key stakeholders, in collaboration with ABSL, the government, and NGOs active in the region. We also hope to delve deeper into several themes raised by our research, from the viability of an outgrower scheme, to energy access issues, to the impact of the Ebola outbreak on the dynamics of FDI and rural transformation.

1 INTRODUCTION

Bioenergy investment is on the rise in sub-Saharan Africa. African countries have turned to bioenergy to support their energy, agricultural and economic development. As the EU, the U.S. and other have set renewable energy targets and biofuel blending requirements, investors have looked to sub-Saharan Africa as a key source for feedstock. Sugarcane has drawn particular attention, as it is a commercially proven, tropical bioenergy crop with significant potential in many African countries (Johnson and Seebaluck 2012). The favourable climate, welcoming governments, and opportunities to access significant tracts of land have added to the region's appeal (Jumbe et al. 2009).

Agricultural-based bioenergy investments can bring large infusions of capital, infrastructure and technology into rural areas. In most of rural Africa, small-scale farming still predominates, and these projects are often the communities' first encounter with large-scale, capital-intensive agro-industry. The projects thus have the potential to bring rapid changes that may boost employment and drive economic growth and development, but may also make considerable use of natural resources that are crucial to local livelihoods, including large amounts of land and water (Florin et al. 2014; Arndt et al. 2012).

The increased pressure on natural resources, combined with a shift in land use from food for local consumption, to export-driven commodity production, may affect local livelihoods and food security in particular (Deininger et al. 2011). Understanding the complex dynamics of bioenergy and other agro-industrial development projects requires a multifaceted, interdisciplinary approach. Researchers need to engage closely with the affected communities to fully understand how they live, what resources they draw upon, and what factors make them more vulnerable or more resilient. At the same time, they need to understand the "big picture": the country's broader economic outlook, policies and governance systems, as well as the diverse perspectives of investors, development banks, and other key actors.

Moreover, it is crucial to recognize that while bioenergy projects may share commonalities – e.g. large-scale agricultural investments by foreign entities, export-driven markets, often an agro-industrial component – they can vary significantly even within individual countries. Key factors may include the crop involved, the developer's agenda, and the role of government and civil society in shaping the project.

This study examines the Makeni Project, developed by Addax Bioenergy Sierra Leone (ABSL), as a window into the complex dynamics of bioenergy and agricultural investment in sub-Saharan Africa. Launched in 2008, the 400 million EUR (~ 500 million USD) sugarcane ethanol project is the largest single investment in agriculture ever made in Sierra Leone.² The company has developed a roughly 10,000 ha sugarcane estate, plus an ethanol distillery, power plant, other buildings, infrastructure and a "biodiversity corridor" covering another 4,300 ha. The facility is expected to produce about 85,000 m³ of ethanol per year, for export to the EU, along with electricity from burning the sugarcane fibre residues (bagasse), including 15 MW of surplus power to be fed into the national grid, providing about 20% of the country's current power supply. The potential to tap into carbon finance sources offered additional incentives. Construction of the distillery and power plant began in 2011 and was completed in 2014, with full production capacity expected to be reached in 2017. As of December 2014, the project had 3,455 local employees.³

The developer's stated ambition is to make the Makeni Project "a benchmark for sustainable investment in Africa". ABSL has secured funding from six development finance institutions (DFIs), and in February 2013, the project also became the first in Africa to be certified by the Roundtable on Sustainable Biomaterials. RSB called ABSL "a model for sustainable projects in Africa", citing provisions covering food security, stakeholder dialogue, human rights, land and water rights, and rigorous environmental criteria.⁴ Jörgen Sandström, a senior executive at ABSL, received the 2014 World Bioenergy Award for his efforts in the Makeni Project.⁵ However, some NGOs have strongly criticized ABSL, holding it up as an example of "land grabs" that benefit businesses at the expense of local livelihoods (see, e.g., ActionAid International 2013; Baxter 2013; Anane and Abiwu 2011).

The nature of the Makeni Project and its significant scale in relation to Sierra Leone's economy thus impart it with national and international significance. The project is also expected to have considerable local impacts in terms of employment, livelihoods, and the physical environment, given the low level of economic development in the area.

In the sections that follow, we describe our research approach, which combined detailed household surveys in communities within and outside the Makeni Project area; rapid rural appraisal; interviews with ABSL staff,



A sugarcane field with its irrigation pivot in Madona.

policy-makers, development agencies and experts; as well as a review of key documents (including prior studies of this project). Our aim has been to provide a nuanced and contextualized picture of how the investment affects livelihoods and development processes, recognizing the perspectives of local communities, the investor and different government agencies, as well as benefits at different levels.

Our findings should be useful to the project developer and international investors, to public agencies and civil society within Sierra Leone, and more broadly to those interested in agro-industrial investments as potential drivers of sustainable development.

1.1 Understanding rural transformation

The concept of “rural transformation” has emerged as a key aspect of development and poverty reduction. About 70% of the world’s poorest people – those living on less than 1.25 USD per day – are in rural areas (IFAD 2010b), and in sub-Saharan Africa, the share is above 75%. Even as urban poverty has declined, and living conditions have improved, many rural communities continue to face hunger and lack access to modern energy, water and sanitation. In this context, a transformation of rural spaces, economies and societies, built on a new development paradigm that empowers rural people, is seen as the key to a more sustainable and prosperous rural future (IFAD 2014). Investment in agriculture, particularly family farms, is considered crucial to this transformation (FAO 2014; IFAD 2014).

The African Development Bank calls agricultural investment “vital for the development goals of promoting growth and reducing poverty” across the continent, noting that the sector supports the livelihoods of 80% of the population (AfDB 2010). Agriculture already plays a key role in low-income African countries’ economies, accounting for 34% of GDP in countries in the 400–1,800 USD per capita GDP range (2005\$), almost two-thirds of employment, and a third of GDP growth in 1993–2005 (The World Bank 2007).

The role of commercial-scale investments in driving rural transformation, however, is less clear. Governments across Africa – including Sierra Leone’s – and development funders continue to actively promote such projects, highlighting their potential value in terms of creating jobs, bringing in capital and new technologies, boosting the sales of local businesses, and linking rural communities to export markets, among other benefits (see, e.g., AfDB 2013; Farole and Winkler 2014). From this perspective, large-scale projects such as Makeni can serve as catalysts for rural transformation, accelerating positive socio-economic changes. Yet there are also growing concerns that such projects might exacerbate rural poverty and food insecurity by reallocating key livelihood resources, particularly farmland (see, e.g., Deininger et al. 2011).

Gauging the Makeni Project’s impact on local communities and their livelihoods, and its (potential) role in driving rural transformation, thus requires exploring multiple issues: from the lasting effects of negotiations over the land acquired, to the jobs and

business opportunities created, to how the project more directly affects existing livelihoods – positively, by increasing technical capacity and bringing new resources, or negatively, by reducing access to land, water, energy, food and other resources.

Our analysis is loosely based on the “sustainable livelihoods” approach (Scoones 1998; Chambers and Conway 1992), a framework that recognizes poverty (and resilience) as multi-dimensional, and examines how rural households build their livelihoods in terms of resources or *capitals* (natural, physical, economic, human and social) and strategies (agricultural intensification or extensification, livelihood diversification and migration). A key insight from this approach is that both formal and informal institutional factors can greatly influence livelihood outcomes, and many of the most important resources on which rural households rely may be informal as well, and not easily quantified in financial terms.

The sustainable livelihoods approach is particularly valuable for exploring how rural households respond to change – and how well-positioned they are to adapt. Faced with a disruption of their livelihoods, they may develop new strategies by drawing on different resource bases. For example, they may exchange seeds for labour depending on the season. They may decide to work with a collective or individually depending on perceived risks, payoffs and safety nets. The strategies and use of different capitals will vary over time, in response to emerging constraints or opportunities – in this case, from the Makeni Project.

Our analysis identified four key change processes being driven by the project: changes in farming systems and natural resource use; a transition from self-employment to wage labour; demographic changes; and changes in infrastructure. By examining these processes, and the capitals available to households as they adapt to changing conditions, we can begin to understand how the Makeni Project is affecting local people’s lives and livelihoods.

1.2 Bioenergy and rural development

Global use of modern bioenergy has more than tripled in the past decade, and liquid biofuels production has more than quadrupled (BP 2014; IEA 2014). Energy security, climate mitigation and rural and agricultural development have driven this expansion in developed and developing countries alike, although the overwhelming majority of liquid transport biofuels are produced in the EU, the U.S. and Brazil. Renewable energy targets and/or blending mandates, particularly in the EU, have created strong demand for biofuels and their feedstocks. Many producers have also prioritized biofuels in their domestic energy policy, as a way to reduce dependence on oil imports (UNCTAD 2014a).

And given that key feedstocks, such as sugarcane, palm oil and jatropha, are tropical crops, biofuels production has been widely promoted as a rural development strategy in countries with suitable agro-ecological conditions. When the EU target of 10% renewable energy in the transport sector was adopted in 2009,



The village of Mayembarai, which is close to the Makeni Project site, but not part of the project.



An irrigation pivot on one of ABSL's sugarcane fields.

sustainable development and poverty reduction were cited as policy goals, highlighting the potential for private-sector biofuels investments in developing countries to introduce new technologies, improve agricultural inputs, and connect rural communities to global markets (Franco et al. 2010). In response to growing evidence of potential impacts on land use and food prices, the European Commission proposed to limit the use of food crops to count towards the renewable energy targets for the transport sector (European Commission 2012); in April 2015, the European Parliament voted to limit biofuels from food crops to 7% of final energy consumption in transport by 2020.⁶

In Africa, growing interest in biofuel production and commercial agriculture has also been driven by the desire to attract foreign investment and increase export revenues (Gasparatos et al. 2012). External financial flows play a major role in African economies, many of which have very modest domestic resources available to invest (AfDB et al. 2014), and while official development assistance (ODA) remains a key source of revenue, particularly for the poorest countries, foreign investment is now the single largest external flow, estimated at a record 80 billion USD in 2014 (vs. 55.2 billion USD in ODA). Numerous private firms from both OECD and non-OECD countries have acquired land in sub-Saharan Africa for large-scale biofuel crop plantations, and some national governments have embraced the investment opportunities (Gasparatos et al. 2012).

Still, Africa's role in biofuels markets has been very limited to date; the Americas (mostly the U.S. and Brazil) produced nearly three-quarters of the world's biofuels in 2013, Europe and Eurasia about 17%, and the Asia Pacific region about 9%, while Africa's share was well under 1% (BP 2014). Many African investments have been unsuccessful, due to lack of infrastructure, weak institutions, insufficient capital, unfavourable international market prices, or greater-than-expected challenges on the ground (Deininger et al. 2011; Souza et al. 2015). But African production is rising fast: from 2006 to 2011, bioethanol production grew from 70,000 to 135,000 m³, and biodiesel production, started in 2008, has grown more than fivefold since (UNCTAD 2014a). Only about 40% of the fuel is used domestically; the rest is exported.

As noted earlier, the biofuel crop that has drawn the most attention in Africa is sugarcane, which is well suited to soil and climatic conditions in several sub-Saharan countries (Johnson and Seebaluck 2012; Watson 2011). Sugarcane's share of global ethanol production is rising, from 25% in 2013 to a projected 31% in 2023 (OECD and FAO 2013). Sugarcane is also the highest-performing feedstock currently in mass production in terms of carbon and energy balances, and it can be used to produce biogas, heat and electricity as well as ethanol. In sub-Saharan Africa, where power and gas grids have yet to reach most rural areas, sugarcane ethanol operations can thus contribute significantly to local energy access, an important catalyst for rural development (Johnson and Seebaluck 2012).

Moreover, sugarcane is a well-established crop in Africa. Citing UN data, Batidzirai and Johnson (2012) note that although Africa only accounted for about 5% of global sugarcane production in 2008, it is home to some of the most efficient sugar industries in the world, with yields in Malawi, Tanzania and Zambia consistently exceeding 100 tonnes per hectare. Citing the region's abundance of agricultural land and the low productivity of some current land uses, they and others have argued for an expansion of agro-industrial development such as sugarcane ethanol. Smallholder producers are expected to benefit from such projects through "outgrower" schemes, a common practice throughout sub-Saharan Africa in which farmers, individually or in groups, produce sugarcane on small plots and sell it to a larger concern. Such schemes have proven profitable in areas with suitable land and climate (Batidzirai and Johnson 2012).

Bioenergy and large-scale land acquisitions

Yet a large share of global sugarcane ethanol production involves very large, corporate-owned, vertically integrated operations with on-site processing (Deininger and Byerlee 2012). A standard model in southern African countries is that 70–80% of sugarcane is sourced from an integrated estate, while the remainder is sourced from outgrowers and/or small independent farmers. The integrated operations can achieve significant economies of scale, but they also have much greater impacts on existing land uses. In many African countries, land designated for these projects may be used by local communities, and even if it is not currently under cultivation, it may be used for pasture or lie fallow as part of a rotation to restore soil fertility (Timilsina et al. 2012). The distributional and economic development benefits of converting such areas to commercial agriculture for sugarcane must be weighed against the costs that might be incurred with respect to local people's livelihoods and food security.

In this context, Brazil's experience as the global leader in sugarcane ethanol offers potential lessons for Africa. Brazil has significant income inequality and land ownership disparities, and there is some evidence that sugarcane operations have concentrated capital, land and power (Martinelli et al. 2011; Sachs 2007). Although wages in the sugarcane sector are generally higher than the average for agricultural workers in Brazil, labour conditions have been found in some cases to be hazardous to workers' health (Martinelli et al. 2011; Azadi et al. 2012). Where operations have been mechanized – which benefits productivity and reduces environmental impacts – employment is much lower, but better paid (*ibid.*). Processing the cane locally,

meanwhile, is linked with higher social and economic development outcomes (Martinelli et al. 2011).

In Africa, biofuels investments are part of a broader surge in large-scale land acquisitions by foreign entities. While data are sparse and sometimes contradictory, the World Bank estimates that some 45 million hectares in Africa were transferred in land deals between 2007 and 2010 (Deininger et al. 2011). This surge in land acquisitions has been driven not only by growing demand for biofuels, but also by interest in producing various food crops for export and by a desire by investors to diversify their portfolios after the financial crisis (Liu et al. 2013). On the supply side, these deals have been facilitated by deregulation and liberalization of agricultural markets, cheap land lease fees and tax exemptions. A 2013 analysis of 26 million ha of land deals for food, biofuels and other uses estimated that up to 1.3 million ha associated with biofuels development may have been acquired in "land grabs" – large-scale acquisitions with negative socio-economic impacts (Hamelinck 2013), including up to 180,000 ha associated with EU biofuels markets. This is a fairly small share of total land, but still notable.

Recognizing that large-scale agricultural investments can have significant negative impacts, and aiming to encourage beneficial investments, the United Nations, the World Bank and other partners, including governments, the private sector and civil society, have worked together to formulate guiding principles. They call for investments to respect land and resource rights; ensure food security; ensure transparency, good governance and a proper enabling environment; involve consultation and participation; be lawful and responsible; and be both socially and environmentally sustainable (FAO et al. 2010). Similar advice has been developed for biofuels projects in particular, with a focus on avoiding food vs. fuel conflicts, minimizing negative social and environmental impacts, and tailoring projects to local needs and conditions (see, e.g., Gasparatos et al. 2012; von Maltitz and Stafford 2011).

Translating such principles into policy and practice, however, is no small challenge. There is a growing body of evidence on common risks and effective measures to address them, which many organizations and certification schemes have translated into practical guidance for policy-makers and investors. Yet as our own discussion of the Makeni Project will show, the issues raised by agro-industrial investments are highly contextual; there are no easy, universal solutions. Thus, our analysis should be seen within this context, as an illustrative case study.

2 AGRICULTURE AND DEVELOPMENT IN SIERRA LEONE

The outbreak of Ebola in May 2014, which had infected more than 13,000 people and killed more than 3,900 as of mid-July 2015,⁷ also had a devastating impact on Sierra Leone's economy. After rapid growth at an annualized rate of about 11.3% in the first half of 2014, GDP shrank by about 2.8% in the second half of the year, and it is expected to shrink by another 2% in 2015.⁸ A large share of foreign direct investment was deferred and is now expected to be cancelled.

Yet hardship is nothing new to Sierra Leone. The country was already one of Africa's poorest when it fell into civil war in 1991. The war lasted until 2002, cost some 70,000 lives, left many maimed, and displaced about 2.6 million people – half the population (Kaldor and Vincent 2006). Many skilled professionals moved to Freetown and abroad, draining most of the country of skilled labour (GoSL 2005). Large amounts of property were destroyed, as was most of the country's social, economic and physical infrastructure – down to local stores, rice mills and community buildings. Farms were abandoned, and civil and political authority almost completely broke down, particularly at the local level.

Sierra Leone's economy has recovered significantly since the end of the civil war, with gross national income (GNI) per capita tripling from 220 USD in 2002 to 660 USD in 2013 (1,690 USD in purchasing power parity terms).⁹ GDP growth averaged 5.9% in 2003–2011, well below the dramatic 26% rise in 2002, but above the sub-Saharan Africa average of 5.4%, and iron ore exports pushed GDP growth to 16.7% in 2012 (AfDB 2013) and to 20% in 2013.¹⁰ Still, despite the government's goal to achieve middle-income status by 2035 (GoSL 2013), Sierra Leone remained very much a Least Developed Country (LDC) even before the Ebola outbreak. ODA accounted for 12.9% of national income in 2012, down from more than a quarter of GNI in 2002–2008, but more than four times the sub-Saharan Africa average of 3.1%.

Sierra Leone has also remained near the bottom of the Human Development Index, ranked No. 183 out of 187 (UNDP 2014), with a score of 0.374, well below the sub-Saharan Africa average of 0.502. Live expectancy at birth in 2013 was only 45.6 years, up by 5 years since 1980; schooling averaged 2.9 years, compared with 4.8 years across sub-Saharan Africa. More than half the population – 51.7% – lived on less than 1.25 USD per day (PPP) in 2010. Considering multidimensional

poverty, which includes living standards, health and education, UNDP found 72.7% of Sierra Leoneans are poor and another 16.7% are near poverty. Nationwide, 51% of women and 41% of men have no education, and only 36% of women and 52% of men are literate (Statistics Sierra Leone and ICF International 2014). Only 5% of rural households have improved sanitation facilities, and less than 1% have electricity.

Effective governance also remains a challenge for Sierra Leone. Several democratic elections have been held since 2002, both at the national and local levels, and concerted efforts have been made to fight corruption and restore trust in government (Transparency International 2013); in the 2014 Corruption Perceptions Index, Sierra Leone ranked No. 119 of 175.¹¹ A recent review found the public sector in Sierra Leone is plagued by low wages, insufficient infrastructure and low-capacity personnel (Transparency International 2013). Civil society, in turn, depends heavily on international funds, and many groups lack a coherent mandate, functional boundaries and autonomy.

Thus, despite great progress since the end of the civil war, Sierra Leone is still considered a “fragile state”. Moreover, as the African Development Bank notes in its latest strategy for the country (AfDB 2013), some underlying drivers of fragility continue to pose serious risks. These include not only the governance and capacity challenges discussed above, but also the inability to develop adequate infrastructure and to foster truly inclusive, sustainable growth. Half the income still goes to just 20% of the people, and the limited impact of growth to date on poverty and unemployment has generated resentment and distrust in the government.

2.1 Agriculture, inclusive growth, and economic diversification

Sierra Leone is rich in natural resources, and like many developing countries, it has relied on these resources to “kick-start” economic growth. The mining sector, a key part of the pre-war economy, is rapidly expanding again, its contribution to GDP rising from 4% in 2011 to a projected 22% in 2013 and 30% in 2017, mostly due to large-scale iron ore operations (AfDB 2013). Yet mining, which is capital-intensive and relies on highly skilled workers, accounts for less than 3% of formal employment in Sierra Leone. The service sector, led by banking, retail, transport and tourism, produced



Farmers in Moyogba, a village near the Makeni Project area.

28% of GDP in 2013, down from 35% in 2011. And manufacturing – mostly cement and light consumer goods – accounted for just 2% of GDP.

Agriculture, which employs about 70% of the labour force, is thus still central to Sierra Leone's economy, even if its GDP share is declining (from 52%, including forestry and fisheries, in 2011, to about 42% in 2013; see AfDB 2013). It is also crucial for food security, and in its three Poverty Reduction Strategy Papers (GoSL 2005; 2008; 2013), the government has identified agricultural development as a priority. Yet agricultural productivity is very low, and historical land use patterns have been devastating to the country's natural resources: about 70% of Sierra Leone's forests have been lost over the decades to a combination of slash-and-burn agriculture and reliance on traditional biomass for household energy (Larbi 2010), along with mining, logging and overgrazing.

The 2013–2018 strategy notes that economic growth so far has not generated enough jobs, and the mining boom “will not give wide opportunities for all, and is liable to shocks” (GoSL 2013). Agricultural development is seen as part of an effort to promote “diversification towards economic sectors with long-term potential for inclusive, sustainable growth”. The goal is to build a “sustainable, diversified, and commercial agricultural sector” that creates jobs for both men and women, ensures food self-sufficiency, and increases exports.

To achieve this, Sierra Leone is to promote both smallholder commercialization and “larger-scale agro-based production” (GoSL 2013).

Notably, the poverty reduction strategies have also consistently emphasized the need to develop the country's rural infrastructure, including roads and utilities. Expanding the energy supply is a priority as well; more than 80% of Sierra Leone's total energy consumption, and more than 90% of household energy, comes from traditional biomass – fuelwood and charcoal (UNDP 2012) – and this is driving deforestation and biodiversity loss (FAO 2013a). Increased domestic energy supplies could help to address the insecurity and price volatility associated with fossil fuel imports. The 2013–2018 poverty reduction strategy sets a goal of increasing power generating capacity from the current 90 MW to 1,000 MW by 2018 through a mix of imports, hydropower, increased thermal power capacity, and some renewables (GoSL 2013).¹²

2.2 Boosting the productivity of smallholder agriculture

More than half of Sierra Leone's total area is agricultural land, though only about 26% – 1.9 million ha – is arable land; another 30% is pastures and meadows.¹³ Small-scale, mostly subsistence farming predominates, with farms averaging 1.63 ha, planted with a mix of rice, cassava, vegetables, and some tree crops such as cocoa, coffee and cashews (MAFFS 2010). Most farmers are poor, and only 5% of households use chemical fertilizers, insecticides, herbicides and motorized equipment. Crop yields are generally low relative to potential yields for the area.

The 2008–2012 strategy (Agenda for Change) identifies key factors that limit smallholder productivity and sets out to address them: from low input use and mechanization, to low irrigation use, to underfunding (less than 3% of the national budget devoted to agriculture), “extremely limited” access to rural financial services, weak rural infrastructure and institutions, and inadequate extension services, data collection and agricultural research (GoSL 2008). The strategy makes it a priority to help smallholders shift to commercial agriculture, but notes that this will require a “significant” mindset change, and effective incentives.

To put these objectives into action, the Ministry of Agriculture, Forestry and Food Security developed the National Sustainable Agriculture Development Plan 2010–2030 (MAFFS 2009), a sector-wide framework designed to make agriculture more productive and

Agriculture Policy Framework

The process normally starts with Farmer Field Schools (FFS) where farmers are trained in viable agricultural and soil management technologies before they are grouped into Farmer Based Organisations (FBOs) and provided with subsidised packages that gives them the means to develop commercial farming practices. The hallmark of the SCP is the establishment of Agricultural Business Centres (ABCs) nationwide.

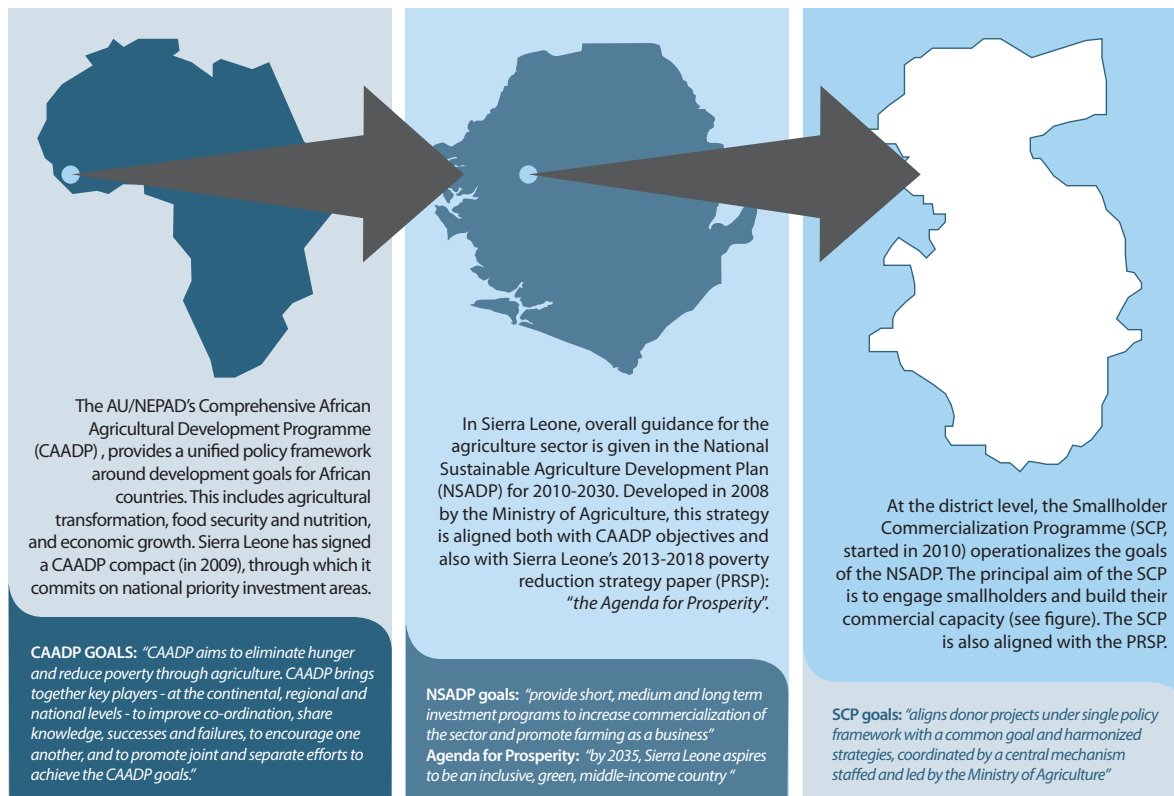


Figure 1: Agricultural policy, from the regional to the district level

efficient and help it become an engine for economic growth and development. The plan includes short-, medium- and long-term investment programmes to help commercialize the sector and promote farming as a business.¹⁴ Figure 1 shows how the plan nests into the African, national and district contexts.

A core aspect of the plan is the **Smallholder Commercialization Programme (SCP)**, which significantly expands support to small farmers to increase productivity, add value, strengthen local farming institutions, and develop commodity chains (MAFFS 2010). The SCP also aims to improve post-harvest infrastructure, increase irrigation use, improve access to markets by improving rural roads, increase access to financial services, increase food security and resilience, and provide more effective, strategic and coordinated planning and implementation of rural programmes.

The SCP has encouraged the formation of **Farmer Based Organizations (FBOs)** – groups established by

and for farmers to serve a variety of functions, from providing services to leading cooperative business ventures (for a discussion, see Fielding et al. 2014). Many such groups already existed prior to the launch of the SCP, but the programme made it a priority to increase their numbers, and formalized their role; FBOs can now register with the government to receive extension services and other benefits from MAFFS.

The SCP also leveraged Sierra Leone's **Farmer Field Schools (FFS)** programme, which had been started in 2003, based on a model first developed in Indonesia but now used in dozens of countries worldwide (Braun and Duveskog 2008). The FFS approach is designed to provide hands-on, experiential learning opportunities for farmers that are tailored to local needs and conditions – and prepare them to teach others as well.

In Sierra Leone, FFS programmes provide a mix of technical training (improved farming practices, technology adoption), organizational training, business planning, life skills, and support to improve farmers'

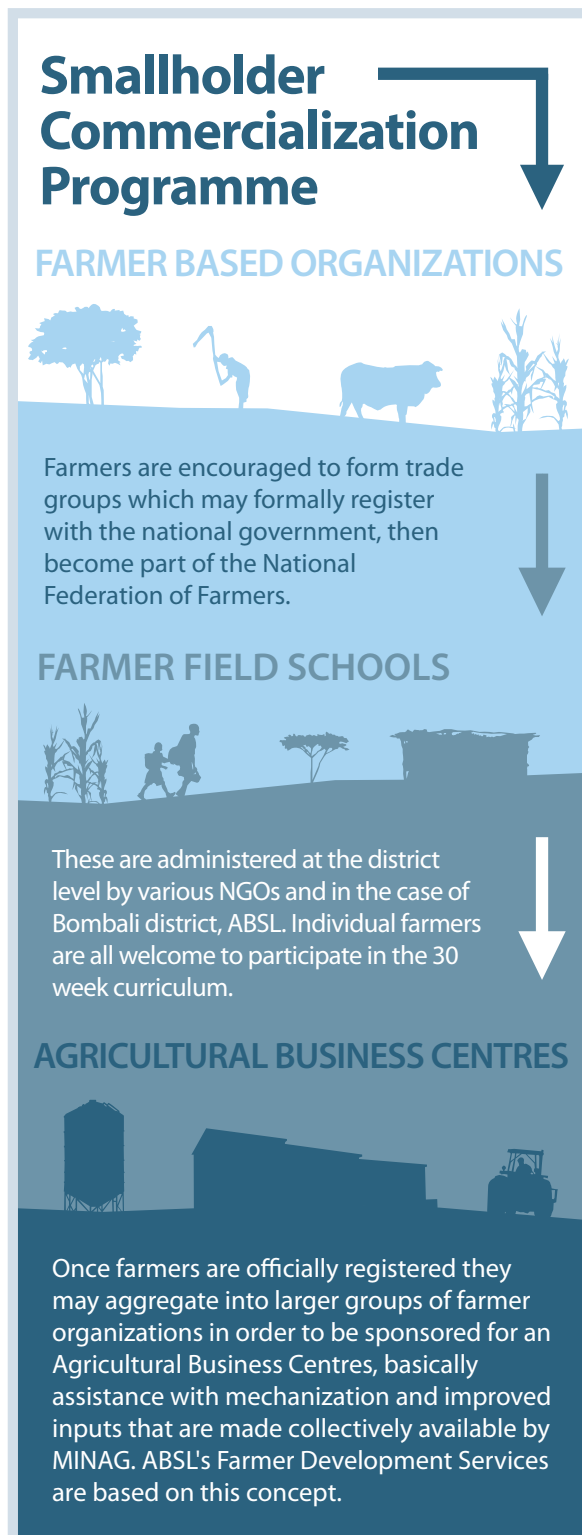


Figure 2: Key elements of the Smallholder Commercialization Programme

decision-making capacity and stimulate local innovation for sustainable agriculture (MAFFS 2010). Nearly 1,500 FFS already existed when the SCP was launched, developed by MAFFS with donor and NGO support, and they became the foundation of the SCP, charged with training FBOs and helping create new ones.

The third key element of the SCP is **Agricultural Business Centres (ABCs)**, which groups of FBOs can form with support from MAFFS, and which then serve as the primary gateway to commercialization (MAFFS 2010). ABCs are the main entry point for MAFFS extension support and provide a range of technical, operational and marketing services to smallholders, focusing on the members' predominant cropping system and economic activity (e.g. rice, other food crops, livestock, non-timber forest products, fish processing). More than 400 ABCs had been established as of mid-2013 (GoSL 2013); the government's goal is to have 2,750 FBOs, all trained in FFS, organized into 650 ABCs (MAFFS 2010). Figure 2 shows how these elements all fit together.

2.3 Promoting foreign investment in agriculture

The Sierra Leone government has recognized foreign investment and trade as essential to unlocking the country's development potential (GoSL 2008; GoSL 2013). By incentivizing investment in the private sector, the government expects to strengthen the economic competitiveness of products with export potential and also realize benefits from the associated transfer of technologies, employment creation and transfer of skills to the local population.

In 2007, the Sierra Leone Investment and Export Promotion Agency (SLIEPA) was established under the Ministry of Trade and Industry to promote foreign investments. The agency designates a focal point for each project and coordinates investors' interactions with different ministries and other entities (including the Human Rights Commission of Sierra Leone). SLIEPA has also actively courted investors, holding a Trade and Investment Forum in the UK in 2009 and offering substantial incentives. From 2008 to 2013, FDI increased tenfold, from 58 million to 579 million USD (UNCTAD 2014b), with new projects in agriculture, mining, telecommunications, banking and transport, among others (see Figure 3).¹⁵

SLIEPA quickly identified bioenergy as a priority area, given the rising demand for biofuels on global markets, substantial unmet demand within

FDI Inflows in Sierra Leone

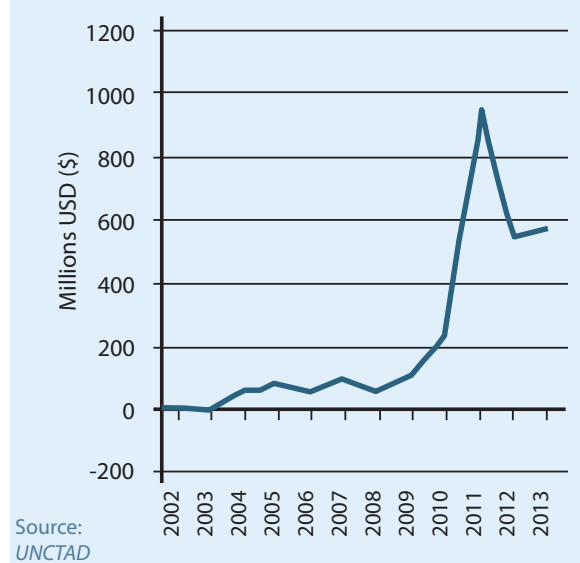


Figure 3: Foreign direct investment in Sierra Leone, 2002–2013

Sierra Leone, favourable climatic conditions, and its potential to strengthen and modernize the agricultural sector (GoSL 2010). Estimating that foreign investments in sugarcane and oil palm alone could create more than 50,000 rural jobs, it launched a campaign focused on those two crops (SLIEPA 2010).¹⁶ The campaign aimed to attract five major investors, and work with local communities in target

regions to assign 10,000+ ha to each, “while retaining sufficient land for food production and other cash crops”. Each investor would cultivate 10,000+ ha, create about 5,000 jobs, and also contract 10,000+ ha of production by local farmers (“outgrowers”), employing another 5,000 people. The resulting production would enable Sierra Leone to boost exports by “at least” 250 million USD per year, stop importing sugar and vegetable oils, add more than 200 MW of power generating capacity, and replace a portion of petroleum imports and local wood and charcoal consumption with sustainable biofuels.

Oil palm was already widely grown in Sierra Leone for local consumption, and while sugarcane production was much lower, only 6,700 tonnes in 2007 (GoSL 2010), a 1,300 ha Chinese-run estate was already producing sugar in the Tonkolili district. Addax Bioenergy had a pilot sugar and ethanol operation, with plans for major expansion.

To attract sugar and oil palm investors, SLIEPA identified areas with particularly good conditions for each crop, and touted the low cost of land (long-term leases for 5–20 USD per ha per year, vs. 100+ USD in Brazil and much more in other countries), the availability of free irrigation water, the low cost of farm labour (2–3 USD per day, along with “flexible” labour regulation allowing “productivity-based” payments), and “very attractive” tax rates, including zero corporate income tax and no duty on imported inputs for qualified investors.



Sierra Leone has identified bioenergy as a priority for foreign investment. Above, an oil palm plantation.

SLIEPA also offered investors logistical support – for example, identifying and securing land – and generous tax breaks for larger investors:¹⁷

- Complete exemption from corporate income tax up to 2020;
- 50% exemption from withholding taxes on dividends paid by agribusiness companies;
- Complete exemption from import duty on farm machinery, agro-processing equipment, agro-chemicals and other key inputs;
- 3-year exemption from import duty on any other plant and equipment, and reduced rate of 3% import duty on any other raw materials;
- 100% loss carry-forward that can be used in any year;
- 125% tax deduction for expenses on R&D, training and export promotion; and
- 3-year income tax exemption for skilled expatriate staff, where bilateral treaties permit it.

As a further incentive, SLIEPA highlighted the benefits of Sierra Leone’s status as a Least Developed Country: Under the EU’s Everything But Arms (EBA) arrangement for LDCs (see European Commission 2014), Sierra Leone products are eligible for unlimited duty-free and quota-free access to the EU market. Similarly, the U.S. Africa Growth and Opportunity Act, effective until September 2015, allows duty-free exports

Steps in the Guidelines	Key Actor	Key Actions
1.Registration	SLIEPA	<ul style="list-style-type: none"> • Company submits letter of intent, requests a business license and registers for the ESHIA (nr 4) process • Enterprise pays fee for community lawyer
2. Consultation	Ministry of Local Government and Rural Development	<ul style="list-style-type: none"> • Representatives from MinLGRD and the lead agency for the investment visit communities • Communities chose representation, formal ways to register grievances with the enterprise are established • 2 open consultations take place: one in the affected communities and one in Freetown
3.Land Lease Negotiation	MLCPE	<ul style="list-style-type: none"> • Initial livelihoods, Impacts and Benefits report written in coordination with ESHIA reporting • Land is surveyed by the Min of Land (charged to enterprise) • Land lease reviewed by MLCPE, signed by landowners who are also given the livelihoods impacts and benefits report
4.Environmental Social Health Impact Assessment (ESHIA)	EPA	<ul style="list-style-type: none"> • ESHIA is conducted by qualified third party of the enterprise’s choosing and then reviewed by EPA • 2 Meetings to present results: in the communities and in Freetown
5.Review and Approval	MAFFS+MOE	<ul style="list-style-type: none"> • Communities are presented with final impacts/benefits report, ESHIA and Land Lease Agreement • If approved MOU is signed between the enterprise and-GoSL
6.Monitoring and Enforcement	EPA	<ul style="list-style-type: none"> • HRC, SLIEPA and EPA, through the grievance mechanisms established in the consultation phase, monitor the enterprise for continued compliance

Table 1: Requirements for businesses under the draft Guidelines for Sustainable Agricultural and Bioenergy Investment

Source: GoSL and FAO (2013).

to the U.S. of eligible products, which include both cane products and oil palm products (SLIEPA 2010).

Building on these efforts, the National Export Strategy 2010–2015 (GoSL 2010) devotes three full pages to sugarcane alone. It notes that attracting investments and realizing their full potential will require a “suitable enabling environment”, and calls for several measures to create it, including accelerated road improvements, finalization of incentives for agribusiness investors, development of a national biofuels policy, improved data collection, and development of guidelines for bioenergy projects.

In the absence of an effective regulatory framework, the impact of large-scale agribusiness projects has begun to be felt in Sierra Leone’s rural areas, and the cost of investment incentives has ballooned.¹⁸ Therefore pressure has mounted to establish clear guidelines and procedures for foreign investments – in bioenergy and more broadly. In 2012–2013, with support from the UN Food and Agriculture Organization (FAO), a multi-agency working group of the Sierra Leone

government reached out to civil society organizations; agriculture/bioenergy businesses and investors, donor institutions, local UN staff, and communities surrounding existing agribusiness/bioenergy operations (FAO 2013b), seeking to identify key problems and potential solutions.

The result was the 76-page draft Guidelines for Sustainable Agricultural and Bioenergy Investment (GoSL and FAO 2013), which recommend a step-by-step process for investors seeking a business license, including an assessment of environmental, social and health impacts (see Table 1). The guidelines also provide a checklist for final approval by the government and a framework for monitoring performance along key indicators. Approval has stalled in the legislature, and the guidelines had not been implemented as of this writing. The Makeni Project was thus not subject to that process, but as discussed in the next section, it did undergo several reviews, including an environmental, social and health impact assessment. The guidelines also incorporated insights gained and processes developed through the Makeni Project.

3 THE MAKENI PROJECT

As noted earlier, the Makeni Project is being developed by Addax Bioenergy Sierra Leone Limited (ABSL). The project site lies about 15 km west of Makeni, in the Northern Province of Sierra Leone, between the Freetown-Lunsar-Makeni highway and the Rokel River. The ABSL estate includes land in three Chiefdoms: Makari Gbanti and Bombali Shebora in the Bombali District, and Malal Mara in the Tonkolili District.

Rice is the main staple food in Sierra Leone, and the bowl-shaped lowlands (“bolilands”) of Bombali and Tonkolili Districts have historically been among the country’s top rice-growing regions. Bombali is also notable for being President Ernest Bai Koroma’s homeland (he is from Makeni); during the civil war, it was a rebel stronghold, and this resulted in considerable displacement and destruction.¹⁹ While progress has been made in the last decade, the economy, social services and infrastructure remain underdeveloped. Tonkolili, to the south of Bombali, is home to Sierra Leone’s most important power source, the Bumbuna Hydro-Electric Station, set to be expanded from its current 50 MW to more than 370 MW,²⁰ as well as a major iron ore project expected to produce 20 million tonnes per year when it reaches full capacity.²¹ It also hosts the country’s oldest large-scale sugarcane estate, the Chinese-run Magbass Sugar Complex, established in the 1980s and rehabilitated after the civil war, and has attracted oil palm and pineapple producers, too.²²

The Makeni Project includes a sugarcane estate – about 10,000 ha of circular fields with pivot irrigation,²³ distributed over the project area – as well as an ethanol distillery (to produce 85,000 m³ per year, intended initially for export to the EU), supporting infrastructure, and a 32MW power plant fuelled by sugarcane bagasse that will meet ABSL’s needs and feed 15 MW to the national grid. ABSL initially leased 52,000 ha for 50 years, deliberately acquiring more land than it expected to need so it could have flexibility in developing the estate. Since 2011, ABSL has been relinquishing unused land, so by late 2014, the estate covered 23,800 ha.²⁴

The project began with a pilot phase, feasibility studies and stakeholder consultations in 2008; in 2010, after meeting regulatory requirements and undergoing multiple reviews, ABSL signed land leases with the chiefdoms and local landowners, as well as a memorandum of understanding with the Sierra Leone government (GoSL and ABSL 2010) covering the



An irrigation pivot on a new sugarcane field.

power supply, payments for water from the Rokel,²⁵ tax breaks and duty exemptions, and legal protection for ABSL.

The project secured 142 million EUR in debt finance from five development finance institutions (DFIs) – the African Development Bank (AfDB); the German Investment and Development Company (DEG); the Netherlands Development Finance Company (FMO); the Industrial Development Corporation of South Africa (IDC); and the Belgian Investment Company for Developing Countries (BIO) – along with the UK-based Emerging Africa Infrastructure Fund and Canada-based Cordiant Capital. In addition, FMO and Sweden’s DFI, Swedfund, joined ABSL as equity partners, with a 21% holding. The AfDB’s environmental, social and health impact assessment encapsulates the rationale for supporting the Makeni Project:

The Addax project builds on the opportunity presented by a growing market for biofuels in Europe as well as preferential trade agreements and suitable climate and lands in Sierra Leone. Sierra Leone is a functioning democracy but as a post-conflict country still suffers from the consequences of the civil war and has been hovering at the bottom of the UN human development index ever since the end of hostilities in 2002. The large-scale job creation and infrastructure and services



A community meeting organized by ABSL in one of the villages in the Makani Project area.

development associated with the Addax project will therefore have a significant positive impact. (Manley et al. 2010b § 2.7)

The assessment also notes that the project is a “priority investment” for the national government and its development partners, as it is envisioned to contribute to employment, diversifying the economy and attracting more FDI. It is aligned with Sierra Leone’s poverty reduction strategy (GoSL 2008) and agriculture plan (MAFFS 2009), and fits well with national investment policy, given the large infusion of FDI, export orientation, contribution to the power grid, and development and transfer of skills and technology, among other benefits (Manley et al. 2010b).

3.1 Leasing arrangements

Yet the assessment also finds considerable risks – particularly to local livelihoods – as a result of the large amount of land leased to ABSL. About 13,600 people live in the 60 villages covered by the project area, and they regard land as “their most precious possession ... their only security in an otherwise economically insecure environment” (Manley et al. 2010b § 4.12). Most households cultivate 0.4–2 ha

each year, but they typically have access to more than 8 ha. They may also engage in activities such as collecting wild plants, producing charcoal, keeping bees, hunting and fishing.

Under Sierra Leone law, land ownership in the provinces is vested in the chiefdoms and communities. A business such as ABSL cannot buy land, but can lease it from the chiefdom for up to 50 years; however, there is no land registry, and ABSL found there was no clear, transparent process for distributing the rent to the traditional landowners.²⁶ ABSL worked with officials to devise a formula in accordance with the law: 20% of the rent would go to the District Council, 20% to the chiefdom administrator, 10% to the national government, and 50% to the landowners (in the project area, families or clans with a claim to the land). ABSL agreed to pay 3.60 USD per acre per year (8.90 USD per ha) under this arrangement (Manley et al. 2010b). In addition, objecting to the law’s provision that landowners are not party to the leases, ABSL created a system by which landowners who sign “Acknowledgement Agreements” recognizing the parties’ rights and obligations under the leases are directly paid another 1.40 USD per acre (3.46 USD per ha). Thus, the total rent is 12.35 USD per ha, of which 7.90 USD, or 64%, goes directly to the landowners.²⁷

The lease negotiation process was long and contentious. As noted above, there was no land registry, so to identify the landowners, ABSL commissioned a detailed geographic information systems (GIS) analysis of the area. Property boundaries were then delineated through a consultation with local leaders and community members. Numerous meetings were held from May 2009 to April 2010 with district and chiefdom officials and landowners, who were charged with discussing the draft lease with their communities (RSB 2013). Meetings were also held in the affected villages. Then, at a public ceremony on 9 April 2010, ABSL and the Chiefdom Councils of Makari Gbanti, Bombali Shebora and Malal Mara signed the leases.

Landowners were represented in the negotiations by a law firm paid by ABSL, which has led some critics to argue that the communities were not adequately represented (see, e.g., Anane and Abiwu 2011; also see discussion in RSB 2013). Several public meetings were organized, which included women's groups, youth leaders and civil society, according to ABSL. However, it is unclear whether landless people and other more vulnerable community members were involved in the process; critics have said they were excluded (ActionAid International 2013; Baxter 2011). Questions have also been raised about local people's negotiating capacity, given that poverty and illiteracy are endemic; as Anane and Abiwu (2011) put it, typical villagers live in "very desperate conditions" and "have little awareness of their rights, obligations and external issues".²⁸ Conversely, the options for increasing local negotiating capacity and legal support are quite limited, and it is not clear how much more could have been done.

Along with helping delineate property boundaries, the GIS analysis enabled ABSL to identify land uses across the project area, which guided site selection. ABSL has said the maps made it possible to completely avoid forested areas, as required by EU biofuels standards, as well as active cropland and dwellings (Manley et al. 2010b). Only 77 people's homes were affected, and less than 1,400 ha of cultivated lands (mostly fallow) were reportedly taken; two-thirds of the land used by ABSL was grassland and scrubland, and the most environmentally sensitive land – 1,800 ha of forests and river buffer zones – was protected as "ecological corridors".

The need to distribute the sugarcane fields to minimize negative impacts is one of the reasons ABSL has given for leasing so much land – more than four times as much as the project is using. ABSL has also said it needs flexibility, because lacking reliable soil and



Landowners who have signed acknowledgment agreements with ABSL receive additional lease payments.

topographic data, it might need to adjust the location of some fields over time, but it will relinquish land it does not need. The leases give it five years to do so; in the meantime, farmers are free to keep using the more than 30,000 ha not occupied by ABSL (Manley et al. 2010b; 2010a).

Notably, the lease payments cover only the land, not the assets on it. Thus, in addition to the leases, under Resettlement Action Plans (RAPs) required by the lenders and the Sierra Leone government, ABSL has compensated the communities affected by the project for any loss of livelihoods and assets, at replacement costs.²⁹ In the pilot phase in 2010, for example, ABSL paid a total of about 3,800 USD for 113 cultivated fields displaced by sugarcane fields, 4,300 USD for trees on those fields, and about 7,000 USD for 683 trees removed to build ABSL infrastructure (Manley et al. 2010a). Separate RAPs have been developed for each stage of the project, with the payment schedule adjusted annually.

Like the land lease process, the RAP payment setup has been widely criticized. It is unclear how much landowners were able to influence the values set for the assets; several critics have argued that one-time payments are inadequate for long-lived resources such as trees, whose lifetime productive value far exceeds the rates paid (Baxter 2013; ActionAid International 2013; Anane and Abiwu 2011).

3.2 Engaging with local communities

One aspect of the Makeni Project that makes it of particular interest to the international community, particularly development policy-makers and practitioners, is the wide range of mitigation measures that ABSL has undertaken in the host communities. While efforts to protect local livelihoods and the environment would be required of any investment financed by DFIs, ABSL, which has a dedicated Department of Social Affairs with several full-time employees, has been widely recognized for its extensive community engagement (see, e.g., Manley et al. 2010b; RSB 2013).

ABSL developed a Social and Environmental Management Programme with several components meant to ensure an adequate food supply for local communities and enhance livelihoods by increasing agricultural productivity, broadening people's skill sets (services, manufacturing, money management, etc.) to support commercialization, and improving their knowledge of health and nutrition, among others (Manley et al. 2010b).

The Farmer Development Programme

Aiming to ensure that households affected by the land leases would have enough staple foods to meet basic

caloric needs, and also further develop their farming skills, ABSL agreed to set up community fields – one near each of the villages – with enough land to supply rice for those recorded as living in the community at the point in time when the calculations were made (about 2,000 ha total, or 0.143 ha per person, to produce about 100 kg of rice per person per year).³⁰ While local farmers had used few inputs prior to this and no mechanical equipment, relying only on periodic fallowing to restore soil fertility, the community fields were designed to use tractors and implements and be cultivated on a more permanent basis.

The FDP is a three-year programme, with each village joining the year that some of its land is converted to sugarcane production. In the first year, ABSL ploughs and prepares the fields and provides the seed. In the second and third years, the communities were supposed to provide the seed (which they could save from the previous harvest); the cost of land preparation and inputs were to be charged on a sliding scale, but ABSL has actually provided it for free (Bisset and Driver 2014). Each community is responsible for upkeep and harvesting of its field.

The programme began in 2010, but struggled at first due to limited availability of farm machinery and inadequate coordination with community members



Women and children from Wareh Wando, one of the communities in the Makeni Project area, visit their FDP fields.



ABSL workers bring farming equipment into Malawi to harvest rice grown through the FDP

(Bisset and Driver 2012). The 2011 season was more successful, though crop yields were uneven – in some cases, due to late ploughing by ABSL, or unsuitable rice varieties planted. ABSL says the most common reason was lack of cooperation by community members, who were unwilling to seed, scare off birds, weed, or otherwise maintain their own fields.³¹ These problems have been addressed over time, however, and villages that had poor yields were allowed to stay in the FDP for longer. Also, because of the timing of plantings and harvests, an independent review has stressed (Bisset and Driver 2012), the FDP difficulties have not left communities with less food than they had prior to ABSL's arrival, but only reduced the expected benefits.³²

FDP enrolment peaked in 2013, with 39 villages enrolled and 1,858 ha planted, supplying rice to a population of 18,400 (Bisset and Driver 2014). The field size has been adjusted, as ABSL found it could meet its yield target with 30% less land; the 2013 harvest produced an average of 1,155 kg/ha. With that harvest, the first 22 villages “graduated” from the FDP – a process that caused anxiety among farmers who feared they would be unable to continue high-yield rice production on their own.³³ Aiming to provide a “soft landing” for FDP graduates, ABSL in late 2013 launched the Farmer Development Services (FDS), discussed below. In 2014, ABSL reported that 1,137 ha were under cultivation in the FDP.

Although rice has been the main crop, in 2013 ABSL also started a pilot vegetable garden programme under the FDP, with seven village plots plus a control plot managed by ABSL (Bisset and Driver 2014). Local farmers (mostly women and Farmer Field and Life School graduates) were given assistance to grow vegetables for local consumption and to sell in local markets and to outsiders who have come to work in the area. The vegetable gardens engaged more people than had participated in rice cultivation, and were found to encourage commercialization. By late 2013, 20 groups had applied to participate. ABSL provides free support in the first year, but will charge farmers (at cost) for services in subsequent years.

Farmer Field and Life Schools

As part of the FDP, about 2,000 household members in the project area are being trained through a 30-week programme involving a mix of classroom instruction and hands-on work on demonstration plots. Adapted from the Farmer Field Schools concept that has been widely applied, with FAO support, across Sierra Leone, the FFLS programme teaches better farming practices to improve productivity and support commercialization, as well as health, nutrition, sanitation, money management and other “life skills” (Manley et al. 2010b).

Household members from all the affected communities are eligible, and are trained in groups of 25–30.

Like the government-sponsored FFS, the ABSL-sponsored programme aims to prepare farmers to form organizations (FBOs) and eventually set up Agricultural Business Centres (ABCs). ABSL has agreements with the FAO and the International Institute for Tropical Agriculture (IITA) to provide support, technical assistance and quality assurance.

Farmer Development Services

Launched in October 2013, the FDS programme is meant to ease the transition to self-sufficiency and eventually commercialization for communities that “graduate” from the FDP (Bisset and Driver 2014). It provides inputs and mechanization to farmers, functioning in a similar way as the Agricultural Business Centres (ABCs) described in Section 2. ABSL set up an FDS facility in Kontobi, with a customer service desk and dedicated equipment (e.g. 12 new tractors), and is making its services available to any farmer or group that applies, with priority to new FDP graduates. Farmers within the project area receive services at ABSL’s cost; others pay a premium. Demand for contract ploughing has been initially quite high, and ABSL last year expressed concern that the FDS service will be over-subscribed (Bisset and Driver 2014, p.11).

Community development

In 2012, ABSL approved a Community and Skills Development Plan that aims to go beyond “impact mitigation” and directly support community

development through a water and sanitation (WASH) improvement project, a skills training centre, and a forestry project (Bisset and Driver 2014).

The first two initiatives have been delayed by a lack of co-financing, but the forestry project has been active since late 2012, with an agroforestry module offered through the FFLS curriculum and a tree nursery that planted about 100,000 seedlings in 2013 alone, more than 56,000 of which were transplanted as part of a re-vegetation effort.

In addition, there have been ad hoc interventions, such as the company providing bicycles, health centres and hand washing stations (to help protect against Ebola). In some instances, ABSL has built wells and boreholes in communities.³⁴

Employment and potential outgrower opportunities

As discussed earlier, the potential for large-scale job creation is one of the main factors that led development finance institutions to support the Makeni Project (Manley et al. 2010a, reiterated in interviews with Swedfund and the African Development Bank). As shown in Table 2, employment has fluctuated; as of May 2014, the total stood at 2,750; and at the end of December 2014, it was 3,455.³⁵ As is common in agricultural employment, many of the jobs are short-term or seasonal. However, the share of permanent

Table 2: Makeni Project employment over time (Sierra Leone nationals)

	February 2012	November 2012	December 2013	December 2014
Permanent employees	312	523	1,108	1,594
Casual employees	946	911	1,044	1,861
TOTAL EMPLOYEES	1,258	1,434	2,152	3,455
% permanent employees	25%	36%	51%	46%
% employees within 20 km	60%	58%	53%	–
% employees within 20 km + Makeni	68%	70%	69%	–
% female employees	10%	8%	12%	10%

Source: Bisset and Driver (2013; 2014) & ABSL³⁷

jobs has increased over time – though the share of employees from the immediate area, excluding Makeni, has declined.

Many of the challenges for ABSL were known from the start. An African Development Bank review had noted that the project “has the potential to significantly enhance the standard of living” in an area with endemic poverty and few options, and it warned: “Expectations of job opportunities and development projects are high amongst local residents. It is very important to instil realistic expectations with regards to benefits from the project, and to develop a strategy of equitable distribution of job opportunities and benefits”, with training to compensate for the “poor” skills base in the area (Manley et al. 2010b § 11.5).

Indeed, the lack of skilled workers has inhibited local hiring (Bisset and Driver 2014). Factory construction and preparations to begin ethanol production require skilled labour, and those jobs have gone to workers from beyond the project area. (Notably, when workers from Makeni are included, the share of workers who are local is much higher and has held steady.)

ABSL staff report that the employment issue has been one of their greatest challenges,³⁶ and annual monitoring reports reflect this. Even as ABSL jobs and purchasing began to contribute “significantly” to local economies, the 2011 review found, “there were inevitable problems of ‘adjustment’ for local people not accustomed to working in a fully monetised

economy for a large industrial enterprise”, including disagreements over contracts and timing of payments (Bisset and Driver 2012, p.9). In mid-2013, a “major labour dispute” involving both seasonal and permanent workers led to a work stoppage; since then, progress has been made in unionizing the agricultural work force, giving ABSL a more structured way to negotiate with labourers (Bisset and Driver 2014).³⁸

Notably, ABSL has suggested that the downscaling of operations in the second half of 2015 will have little impact on local employment. Not only is there a “naturally-low level of activity” during the rainy season – i.e. few seasonal jobs – but ABSL said “most local employees will be maintained”, while the number of “expatriate consultants” will be temporarily reduced.³⁹As discussed in Section 2, the Sierra Leone government also envisions biofuels projects providing outgrower opportunities – enough, in fact, to double their employment impact (SLIEPA 2010). ABSL’s original plans for the Makeni Project included an outgrower support scheme (see, e.g., GoSL and ABSL 2010), but logistical challenges, including obstacles that have arisen in the FDP, have kept ABSL from moving forward. The external monitor’s 2013 report notes “limited progress” in advancing what it calls “FDP 2.0”: “Cane out-growing is still the main option, perhaps combined with development of more traditional smallholder agricultural activities, but its viability needs careful analysis”, as it would likely require using what is now prime rice-growing land (Bisset and Driver 2014, pp.9–10).

4 FIELD RESEARCH APPROACH AND FINDINGS

As noted in the introduction, the goal of our study is to examine the process of rural transformation occurring in the communities affected by the Makeni Project, and the project’s implications for local people’s livelihoods. Loosely following the “sustainable livelihoods” approach (Scoones 1998; Chambers and Conway 1992), we examine the different types of capital that underpin rural households’ livelihoods in the Makeni region – natural resources, skills, social capital, infrastructure, financial resources – and how the ABSL project is affecting those capitals. We look at the kinds of trade-offs that households are making in response to changing conditions, and try to gauge whether quality of life is improving or worsening.

Based on the issues raised by community members during our interactions, we focus particularly on four ongoing change processes:

- Changes in access to and use of natural resources;
- Changes in infrastructure;

- New income sources and transition to wage labour; and
- Demographic changes.

To gauge the impact of the Makeni Project, we compared communities that were directly affected by ABSL activities with some that were not (a control sample). We chose six communities within the Makeni Project area, based on data from ABSL’s baseline surveys and studies. We looked for a mix in terms of population size, community land area, share of that land leased to ABSL, and date of entering the FDP.

The three control communities are similar to the project communities in terms of demographics and proximity to the Rokel River and the Freetown-Makeni highway, but they have no formal engagement with ABSL. Table 3 provides basic details for the six project communities; Figure 4 shows all nine communities on the map. The field research methods were applied equally across all communities,

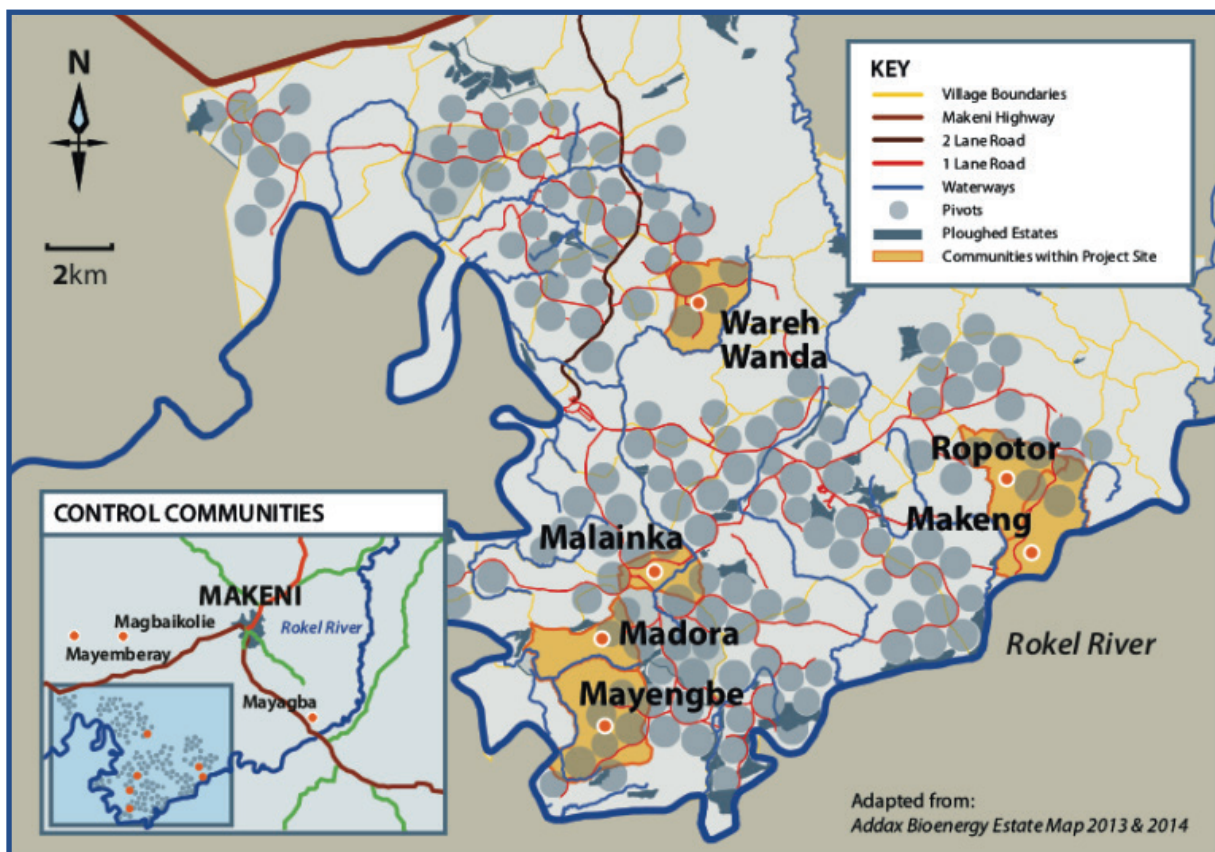


Figure 4: Project communities and control communities covered by this study

Table 3: Overview of the six project communities studied

Name	Population (2012)	Community land (ha)	Land leased by ABSL (ha)*	Land leased by ABSL (%)*
Madora	627	489	98	20%
Makeng	507	512	155	30%
Malainka	732	259	105	41%
Mayengbe	455	743	329	45%
Ropotor	323	444	228	52%
Wareh Wanda	350	464	207	45%

Source: ABSL. * Note: Data are as of December 2013. Land leased is the full area covered by the original ABSL leases. As noted in Section 3, ABSL has since relinquished more than half of the total land leased, but we do not have detailed information that would allow us to determine how much land in each community has been relinquished.

and every household was surveyed in all nine communities. Table 4 shows the indicators for which data were collected, by type of capital.

The field research was conducted by a team of six research assistants (listed in the acknowledgements) led by a field coordinator. All the assistants spoke Temne, the local language, and had good knowledge of local customs and traditions; they were trained in the research methods and had several days of practice and testing in a village near Makeni. Prior to engaging with residents of each community, the team paid a courtesy visit to the chief to inform him about the project, ask permission to conduct research in the community, and get the chief's perspective on the issues being examined.

4.1 Field research elements

Household surveys

As noted above, all households in each of the nine communities were surveyed. In the first round, in November 2013, 327 households were surveyed; in the second round, in April 2014, 331 households were surveyed. There was significant demographic change; only 199 of the households were matched from the first to the second round (see discussion in Section 4.3).

The household survey included 36 questions (with some adjusting between rounds 1 and 2) and took about 45 minutes to complete. It was designed to capture data on levels of poverty; income and expenditures; agricultural practices; food shortages and coping

Table 4: Indicators for which data were collected, by type of capital

Type of capital	Measurement indices incorporated in the research
Natural	Distance/time to gather water and firewood, diversity of crops grown, agricultural production (yields, observations on soil fertility)
Physical	Changes in housing (building materials), water delivery infrastructure, facilities for value-added crop processing, use of irrigation
Social	Participation in FFLS, skills acquired in FFLS, participation in FBOs, employment of women by ABSL
Human	Number of school-aged children in school, health status
Financial	Food prices, participation in FDS, profitability of agriculture, desire to engage in wage labour

strategies; electricity and household energy sources and use; water use, access and irrigation practices; and participation in FDP/FFLS programmes and farmer associations. It also included a number of hypothetical “what if” questions aiming to capture the willingness of households to potentially grow sugarcane for commercial purposes in the future, and/or to shift from firewood to other fuels (see full household survey questionnaire in Annex 7.2).

The first 10 questions cover the Grameen Foundation’s Progress out of Poverty Index (PPI),⁴⁰ calibrated for use in Sierra Leone (per Schreiner 2011); this is a proxy for overall well-being, calculated from expenditure data, which allows the researcher to derive a score reflecting each household’s likelihood that they are living below the Sierra Leonean national poverty line (around 0.50 USD per day).⁴¹ As this index has previously been used mostly by micro-finance organizations to track the impact of their lending, its use here is somewhat novel and produced results of varying significance. The survey data were analysed with SPSS statistics software,⁴² using non-parametric tests of correlation to gauge differences between the project and control communities.

We should note that we use the household survey data to provide context – e.g. to gauge the availability of and access to resources, and highlight differences on these indicators between the project site and control

site. As we discuss further below, the time-span of our project did not allow for a longitudinal comparison, nor is it possible to make causal links between the Makeni Project and noticeable differences in the indicators. However, the survey data can serve as a baseline for future analysis of the impacts of the Makeni Project.

Rapid rural appraisal

Rapid rural appraisal (RRA) is a participatory research approach that starts from the notion that community members are the foremost experts on their own lives, and if given the tools, they are well positioned to analyse their livelihoods and assets (Chambers 1992; McCracken et al. 1988). Unlike participatory rural appraisal (PRA), in which community members co-design the research to meet their own needs, RRA is externally driven, focused on gathering information. Given the constraints of our project, PRAs were not feasible, but our field research included RRAs in all nine communities. We worked with groups of seven or eight community members, focusing on community resources and changes over time, using the following participatory tools:

1. **Community resource maps:** Participants drew a map of their community that included important natural, physical and socio/cultural resources. This generated insights on agricultural practices, crops, processing and storage facilities for crops, as well as schools, roads and water sources.
2. **Impact diagram:** Here community members noted recent changes and their causal relationships, including the extent to which changes in their well-being could be attributed to the Makeni Project.
3. **Venn diagram (first round only):** Participants identified organizations and institutions with influence in the communities and ranked them by impact, highlighting those which provide services they deem central to their well-being.
4. **Seasonal calendar:** Participants identified the various tasks the community engages in throughout the year, including all aspects of agricultural production (planting, harvesting) and supplemental activities such as fishing and hunting. Periods of water, food and energy scarcity and abundance was also reported.
5. **Focus groups:** These discussions were loosely structured around an open-ended question: What have been the changes, challenges and opportunities in your community with respect to food, water, energy and livelihoods in general?



581 field researcher Darlington Kamara conducts a household survey in Wareh Wandu, a village in the Makeni Project area.

To the extent possible, we tried to capture gender differences as well.

The research team displayed the resource maps and impact diagrams for the duration of their visits, and invited discussion and corroboration. They also prepared a brief summary of initial findings per community and shared it with the participants from that community on the last day of their visit. This helped ensure that viewpoints were accurately depicted and that community members agreed with the data that underlie this analysis.

The notes from the RRA exercises were coded using qualitative analysis software (ATLAS.ti⁴³) to identify recurring themes. Through this analysis we also identified the four key change processes under way: the transition to wage labour, changes in agricultural production and natural resource use, changes in infrastructure and changes in population. We then gauged the prevalence of each issue, explanations, and associated impacts mentioned for each of the four change processes, comparing the project villages and control villages. Where possible, assertions made in the RRA exercises or interviews (see below) were cross-checked with household survey data.

SEASONAL CALENDAR - MADORA COMMUNITY

ACTIVITY	MONTHS											
	J	F	M	A	M	J	J	A	S	O	N	D
AGRICULTURAL ACTIVITIES												
Bush Clearing	✓	✓	✓									
Planting						✓	✓					
Wooding								✓	✓			
Scaring of Birds										✓	✓	
Harvesting											✓	✓
Thrashing	✓									✓	✓	✓
Transporting	✓									✓	✓	✓
Storing	✓									✓	✓	✓
FESTIVALS												
Christmas												✓
Ed-ul Adah	IRREGULAR											
Ed-ul Fitri	IRREGULAR											
Easter day												✓
Independence Day						✓						
African child's Day												✓
SECRET SOCIETIES												
Bondo	✓											✓
Poro												✓
Sowei												✓
Chiefdom Crowning Day												✓
SPORTS SEASON												
Football Gala												✓
School Sports												✓
TRADE FAIRES DAY												
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
EXTRA ACTIVITIES												
Gardening	✓											✓
Swamp Preparation/Planting												✓
Swamp Harvesting												✓

Water Shortage
Planting
Food Shortage
Planting
Water Shortage
Planting
Planting

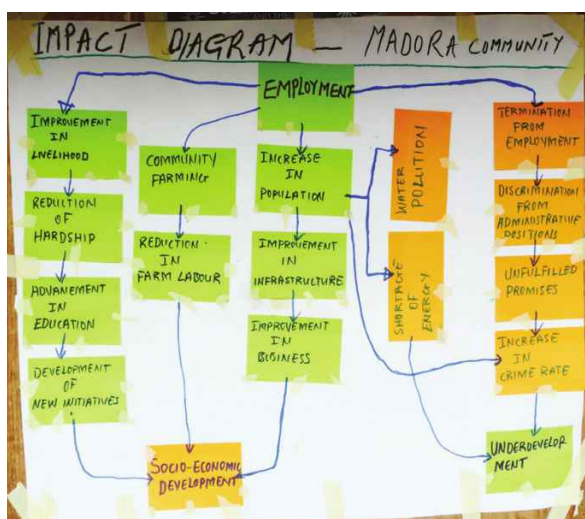
A seasonal calendar developed with community members in Madora.



The resource map developed with community members in the village of Ropotaw, part of the Makani Project area.



SEI field researchers work with community members in Madora to develop a diagram of the local impacts of the Makeni Project.



This is the result of the exercise shown in the picture above

and Food Security (MAFFS), the Ministry of Water Resources, and the Sierra Leone Investment Promotion Agency (SLIEPA), as well as two development finance institutions: Swedfund and the African Development Bank, and a representative of the EU delegation to Sierra Leone.

The interviews included questions how Sierra Leone's development challenges and priorities and how the Makeni Project fits with different agencies' goals. Interviewees were also asked to reflect more broadly on the risks, impacts and benefits of agro-industrial investment in general, and the Makeni Project specifically. Finally, a longer interview was conducted with ABSL leadership to clarify aspects of the company's operation and engagement with the communities, and to document ABSL's perspective on some contested or conflicting elements of the narrative that emerged from the research. All interviews were recorded and transcribed.

Interviews

In addition to the field research described above, the project team interviewed policy-makers, ABSL staff and other stakeholders at the beginning of the project, during a follow-up visit in April 2014 and, more in-depth, in late 2014, after an initial review of the survey and RRA results. Interviewees included representatives of the Sierra Leone Ministry of Agriculture, Forestry

Limitations of the data

Our original research plan was to conduct household surveys and RRAs three times over a 12-month period. We recognized this short time-frame would limit our

ability to identify clear changes and establish causal links between those changes and the Makeni Project. However, given the rapid nature of some of the expected changes, we were confident that we would at least be able to show some emerging trends.

After the first data collection, the RRA methods and survey questions were refined for the second round. These two rounds provided snapshots of the communities in the dry and wet season, respectively; the third collection, scheduled for September 2014, would have begun to show year-to-year changes. However, due to the Ebola outbreak, we had to cancel the third data collection. Therefore, with the notable exception of quantifying population changes, we present results mostly from the second survey, and have adjusted the analytical approach to avoid misidentifying seasonal variations as changes due to the Makeni Project.

Finally, it is important to note that we did not interview district- or local-level government officials. While we did consult national-level officials at several stages of the project, in our final, crucial research phase, we were unable to conduct in-person interviews due to the Ebola outbreak. As a result, our consultations were more limited, and done by telephone.

4.2 Socio-economic conditions in the study area

The survey questions covering the Progress out of Poverty Index (PPI) allow us to gauge general poverty levels within the Makeni Project area and in the control villages. As shown in Table 5, the median PPI score is for the project villages was 41, corresponding to a 62% likelihood of a household living on less than 0.50 USD/

day,⁴⁴ and a 25% likelihood of households being below the food poverty line.⁴⁵ People in the control villages scored slightly worse overall, but poverty is severe across the board. Without an established baseline before the start of the Makeni Project, we cannot know whether the differences pre-date the project, and we have insufficient information to attribute the differences to specific factors.

Food security is a critical indicator of well-being, and of particular concern when analysing the effects of land-based investments such as the Makeni Project, which affect access to and use of cropland. Food security goes beyond calories available. As defined at the 1996 World Food Summit, “Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life.”⁴⁶

Sierra Leone has long struggled with food insecurity; the World Food Programme found 45% of households were food-insecure, 6.5% severely so (WFP 2011). While conditions in Bombali district were better (25.5% food-insecure, 2.1% severely), Tonkolili district had the country’s third-highest food insecurity rate, 74.1% (22.5% severely). The WFP also found seasonal patterns, with food insecurity concentrated in June–August, particularly for rural households, whose home-grown food supply is mostly spent at that point. As demand for purchased food rises, the price of locally produced rice also tends to spike. A 2013 update from the WFP⁴⁷ notes that Sierra Leone also has the highest inflation in West Africa: 10.9% from May 2012 to May 2013 – 11.8% for food prices. Nationwide, households spend on average 63% of their budgets on food, and borrowing money for food is common (52%).

Table 5: PPI scores and probabilities of lying below poverty lines

	Control villages			Makeni Project villages		
	PPI	<1.25 USD (%)	Food (%)	PPI	<1.25 USD (%)	Food (%)
minimum	12	100.0	100.0	7	100.0	100.0
lowest 25%	31	74.4	33.1	32	74.4	33.1
Median	37	69.0	35.1	41	62.4	25.3
highest 25%	43	62.4	25.3	47	51.5	16.9
maximum	63	13.8	1.4	67	9.6	1.5

Note: We use the food poverty line as defined in Schreiner (2011).

In our survey, we asked households on which months they had not had enough food to meet household needs during the past three years. The answers provide an indication of food insecurity levels and seasonal patterns, but do not cover the full picture, such as nutritional quality, affordability or fit with households' preferences. Figure 5 shows that a considerable share of households in the project (and control) villages indicated food shortages in June, July, August and September. Comparing the project and control villages, a greater share of households in the project villages reported food shortages in July. However, the figure only indicates the prevalence of food shortages in the communities (yes/no), not their severity. Households in both sets of villages said they coped with food shortages by spending more money to buy food, borrowing from others in the community, or eating less.

As noted in Section 3, ABSL has begun to support the planting of vegetable gardens in communities participating in the Farmer Development Programme (FDP). Our household surveys found a greater diversity of food available in the project villages, some of which was also attributed to new crops being brought in through the work of ABSL. The surveys show that 28 different crops were cultivated in the project villages, compared with 20 in the control villages. Households in the project villages identified 29 different food

items that they purchased regularly at local markets, compared with 19 in the control site.

Use of natural resources

Our household surveys found 90% relied at least in part on rainfed subsistence agriculture for their livelihoods. None used irrigation, except for buckets and watering cans. The most common crops grown are rice (74%), cassava (60%), groundnuts (40%), peppers (40%), potatoes (32%), okra (32%), eggplant (26%), maize (24%) and beans (20%). Cassava, pepper, groundnut, rice and potatoes are often grown as cash crops, and a majority of households reported buying rice and peppers as well as other cash crops. What is grown for sale vs. own consumption is otherwise fluid, with household choosing what to sell depending on prices and availability. Most communities have reserved land for communal cultivation of oil palm. Additionally, it is common practice for households to maintain fruit and vegetable gardens close to their homes (other crops, such as rice and cassava, are grown in more distant fields).⁴⁸

Food production and incomes fluctuate seasonally, with home-grown food availability at its lowest in June–October (the wet season runs from May to October, and the dry season from November to April). Households cope by purchasing food, but if this gets too expensive, they will switch to cheaper products;

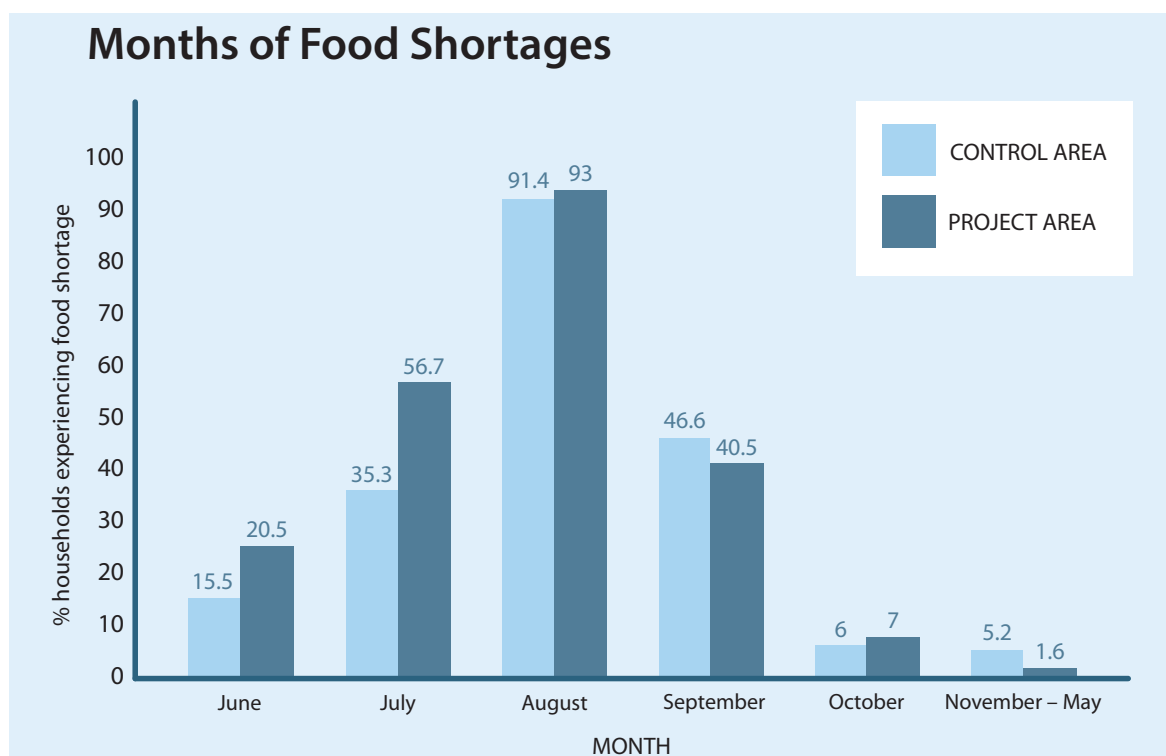


Figure 5: Prevalence of food shortages over the past three years, by months reported.

some also seek support from others. Government data show a fifth of Bombali households keep livestock – mostly goats and sheep – while only about 4% in Tonkolili do so (Larbi 2010).⁴⁹

The Rokel River figures prominently on most of the resource maps produced by community members as part of our RRAs. Pumps and boreholes have been set up in the villages, and every community we surveyed has received a hand pump at some point from either an NGO or a government agency, but several pumps were in disrepair. Across Sierra Leone, 48% of rural people have access to an improved water source such as a protected spring, borehole or public tap, while 25% rely on surface water and another 27% from unprotected springs or wells (Statistics Sierra Leone and ICF International 2014). In our survey, we found that although borehole water is cleaner, many local women said they preferred to get water from the river so they could also bathe and wash clothes.

Water access issues are widespread, particularly in the dry season, when in some villages, the pumps run dry. (A study of water sources in three districts, including Tonkolili, found that 80% of point sources could not deliver safe water year-round; see Bourgois et al. 2013). Households reported that it took them between 15 minutes and an hour to get water in the dry season. More than 70% said that in the dry season, they face competition in obtaining water for household use, and more than a third said conflicts over water affected their personal safety. In one village, all the focus group participants said they were having to go to another village to get clean water for drinking and cooking.

Water quality is another major concern. Across Sierra Leone, only 11% of rural people treat their drinking water, mostly by adding chlorine (Statistics Sierra Leone and ICF International 2014), and water treatment is also uncommon in the project area. Households in both the project and control villages reported getting sick from the water (59%) and said the water is dirty (34%), contaminated (22%) and/or smelly (10%). In the RRA exercises, the water was described as dirty, smelly and strange-tasting. In the household survey, communities associated the poor water quality with a number of health problems, including diarrhoea and cholera.

Infrastructure and access to physical capital

As discussed in earlier sections, poor infrastructure is one of Sierra Leone's greatest development challenges – particularly in rural areas. The lack of roads makes it difficult to take goods to market, travel to work, or access supplies and services. Across rural Africa, lack of roads, reliable electric power and efficient logistical

networks are among the most significant factors hindering sustainable development (Juma 2011). Supporting infrastructure development, including roads, has been a major focus of World Bank activities in Sierra Leone in the last decade, and it continues to be a priority.⁵⁰

Roads are a primary concern of the communities we surveyed, including those relatively close to the main highway to Makeni. Another, smaller road which connects a few villages, including one with a health centre, was also featured on the resource maps.

Energy infrastructure, meanwhile, remains nearly non-existent in the region. While the ABSL project will be producing a considerable amount of power to be sold to the national grid, power generation to date has been limited, and it has had no impact on local communities, as they are not connected to the grid. Not only do households have no electricity, but when asked how they might use it if they had it, many were unsure. The most common response was that it would be useful for starting a small business. Some small businesses in the area use generators (e.g. for coolers for soft drinks or mobile phone charging stations). One village chief was able to buy a generator, reportedly with money from ABSL land rents/asset compensation. Almost all households (99%) said they primarily cook with firewood, in line with national data showing 97% of rural households cook with wood (Statistics Sierra Leone and ICF International 2014).

Some agricultural infrastructure has been developed in the region through the Smallholder Commercialization Programme, and participants in the RRA included it in their community resource maps. This includes concrete drying floors for rice (else it is dried on dirt floors), improved storage facilities, and a gari (cassava product) factory. Some of these resources are associated with cooperative business ventures.

Skills and level of education

As discussed earlier, educational attainment in Sierra Leone is low – particularly in rural areas. Only 39% of rural men and 23% of rural women are literate, and 54% of rural men and 68% of rural women have no schooling (Statistics Sierra Leone and ICF International 2014). Only 67% of rural children aged 6–11 attend primary school, and only 29% of rural 12–18-year-olds attend secondary school. Conditions are somewhat better in Bombali and Tonkolili Districts, with literacy rates of 53% for men and 39% for women in Bombali, and 45% and 28%, respectively, in Tonkolili. School attendance is also higher: 78% for primary school and 51% for secondary school in Bombali, and 71% and

32% in Tonkolili, respectively. In our research, 78% of households with children aged 6–13 said they were attending school. Yet all government schools in Sierra Leone charge fees, and one of the concerns that arose most frequently in the RRA exercises was how to cover the school fees.

Literacy and job skills are particularly important in the context of the Makeni Project because, as noted above, many of the jobs at ABSL require skills that are in short supply locally. In interviews, ABSL management said this makes it difficult to hire locally, especially for semi-skilled and management positions. Community members complain that people are hired but quickly let go because they are said to lack the necessary skills. Yet this gap was known at the outset, and the African Development Bank had urged ABSL to make special efforts to address it (Manley et al. 2010b). Swedfund representatives also stressed in interviews that skills transfer and on-the-job training were a major priority for the DFI funding partners.

Human capacity is not only a concern at the community level, but also in government, as discussed earlier. Despite efforts to build capacity at the district and local levels, government resources remain concentrated in Freetown. Finding qualified staff and resources in rural areas is difficult. The lack of a property registry made it necessary for ABSL to develop its own maps,

and sort out property boundaries with the chiefs and landowners. The key agencies with oversight over the Makeni Project have made field visits, but do not have much of a continued presence. The most visible national agency in the area, as identified through the RRA exercises, is the Ministry of Health, which runs a few nearby health clinics.

Poor health is a major challenge in these communities. Even before the Ebola outbreak, diseases such as malaria, cholera, HIV and nutrition-related problems were taking a serious toll, affecting school attendance and livelihood activities. The use of firewood for cooking is also deleterious to health, particularly for girls and women – due to smoke exposure and hazards faced in procuring firewood, such as snakes. Some health risks associated with the Makeni Project itself were identified in initial assessments, including workplace injuries, exposure to chemicals, and air pollution (Manley et al. 2010b).⁵¹ Many more potential benefits were identified, however, such as providing hand-washing stations during the Ebola outbreak, and planned improvements to water and sanitation infrastructure; ABSL also incorporated health and nutrition in its FFLS curriculum.

Access to markets and finance

As noted earlier, the bolilands of Bombali and Tonkolili Districts are among Sierra Leone’s top rice-growing



Outside Warreh Wanda, community members collect water from what little remains of the river in the dry season.



The 'hollands' of Bombali and Tonkolili have historically been among Sierra Leone's top rice-growing regions.

regions. In 2007, Bombali grew about 67,500 tonnes of rice, and Tonkolili, about 58,000, or a combined 20% of domestic rice production – the majority grown on fields under 1 ha (Spencer et al. 2009). Yet producers in the region have not reaped great economic benefits from this, for several reasons.

First of all, most of the rice that is not consumed by the producing households is sold locally, and in the Makeni region, local rice has tended to be more expensive than imported rice – which many consumers also prefer for its taste and quality – though the price disadvantage was reversed in 2011 (Spencer 2012, Figure 6). Domestic integration of rice markets in Sierra Leone has been limited, due to inter-annual variability in production, a low volume of commercial surpluses, and poor infrastructure, among other reasons (WFP 2011).

Scaling up production has proven a challenge as well. Rice crop yields remain low, despite the introduction of improved varieties, mainly because fertilizer use is low (Spencer 2012). Government efforts to distribute inputs at subsidized rates have proven costly, inefficient and not sustainable in the long term, and the private sector is only starting to fill the gap. Despite ambitious national goals and programmes, extension services and other supports to farmers also remain limited and poorly coordinated, and poor infrastructure also makes it difficult to get products to market. Maconachie and Binns (2007) found that when

new marketing opportunities arose around mining operations, women from nearby communities would walk 15 km round-trip, carrying loads on their heads, to sell their farm goods.

In our field research, we found that communities were seeking to diversify and bolster their incomes through activities other than wage labour. Preferences were expressed for livestock, mechanized farming and formation of small businesses as avenues to increased incomes.

Improved access to finance could greatly improve the viability of such ventures. As part of the Smallholder Commercialization Programme (SCP), the government is promoting the establishment of Financial Services Associations (FSAs) and community banks in rural areas. FSAs, which were first set up in Sierra Leone through a pilot programme with the International Fund for Agricultural Development (IFAD 2010a), are owned and managed by community members, and operate in communities that do not have access to banks, serving farmers who might not be eligible for other forms of financial services.⁵² The SCP aims to establish at least 130 FSAs; as of mid-2013, there were more than 50 (GoSL 2013).

Social and political dynamics

Local chiefs play a key role in the governance of rural communities in Sierra Leone, raising taxes, controlling

the judicial system and allocating land (Acemoglu et al. 2013). Although their power is inherited – they are all members of the ruling families recognized by British authorities during colonial times – they hold a high degree of political legitimacy among local people. Strong chiefdoms are also associated with higher levels of engagement in civil society organizations. Bombali district has 13 chiefdoms, and Tonkolili, 11.

Social organizations, particularly Farmer Based Organizations (FBOs), have been active in Makeni region communities for some time; some pre-date the civil war (see Fielding et al. 2014 for a detailed discussion). Their goals and functions vary: some manage a collective resource such as a micro-loan service or drying/processing facility, while others are entrepreneurial, collaboratively producing agricultural goods for market. One community formed a landholders association when ABSL arrived. The FBOs also provide safety nets to help farming families cope, via revolving funds for seeds, school fees, support in times of crisis, and the like. As these FBOs are rooted in the communities' social networks, they are in a unique position to address farmers' needs. As noted in Section 2, under the SCP, these groups can also now formally register with the government and thus increase their chances of receiving technical support or inputs from the MAFFS. However, according to ABSL, no new FBOs have been formed in the area despite the enhanced support received.⁵³

So-called “secret societies” are prominent in the region and constitute an important part of community members' lives. Each village reported their presence and the associated rituals they practiced at different times throughout the year. These are often segregated by gender.

Social and family structures are complex, more so because of the long civil war. Frequent migration is a fact of life (Maconachie and Binns 2007). ABSL officials reported that frequently during their land negotiations, a son or other relative would appear from Freetown in order to be involved in a family's financial affairs. Extended families often live together in order to conserve resources, but may split into separate households if given the opportunity to build more housing.

Gender differences remain substantial, particularly in agricultural production. Although men and women both engage in a wide range of activities, women predominate in crop farming, raising poultry for the household, processing and selling fish, collecting water, and gathering fuelwood, vegetables, herbs, fruits and nuts from forests. Raising cattle, goats and

sheep, hunting, fishing and forestry are predominantly men's activities (AfDB 2011).

In general, an African Development Bank gender profile of Sierra Leone notes, women are marginalized in the agricultural sector: “They have little or no access to credit facilities, improved technologies, extension services and post-harvest technologies. Furthermore, they do not have permanent land rights and can be dispossessed of their lands by male relatives or through divorce or death of their spouse” (AfDB 2011, p.9). While their presence in the private formal sector is “negligible”, 84% of rural women are active in the informal economy, with few, if any, social-protection provisions and meagre earnings for their labour.

4.3 Key change processes

As discussed in earlier sections, Sierra Leone and the Makeni region are changing rapidly, and there is a great deal of economic activity beyond the Makeni Project – though the Ebola crisis has disrupted much of it. Thus, while the goal of our study is to examine how agro-industrial investments such as this can affect livelihoods and rural transformation, there are too many factors at play to attribute many observed trends to ABSL's activities in particular. Here we focus on change processes in which the links are fairly obvious and direct, as highlighted by the communities we surveyed.

Changing access to and use of natural resources

By leasing land in these communities, ABSL has directly affected the availability and use of land and other natural resources in the project area. To the extent that the land leased was actively under cultivation, farmers have had to find new places to grow their crops, and prepare their fields. As discussed in Section 3, under the FDP, ABSL has planted new community fields for each of the affected villages, designed to grow enough rice to fully meet those communities' caloric needs. ABSL has also provided mechanical equipment and inputs for the FDP fields – and, through the FDS programme, is now offering inputs and ploughing services, for hire, to farmers within and outside the project area.

In focus group discussions, community members offered mixed reviews of the FDP and FDS. Many said the ploughing and seeds provided through the FDP had helped them to produce more food – not just to eat but also to sell. Some said they could use the rice grown through the FDP to get through the mid-year lean months. Yet farmers also noted the FDP's limitations;



A community vegetable garden next to the river outside Mgobhofole, a village near the Makani Project area.

women in Mayengbe, for example, noted that it was not enough to sustain them, though men in the village said it contributed to better incomes. To the extent that farmers felt they had benefited from the FDP, they often expressed disappointment that their enrolment would soon end (e.g. in Malainka, where men worried about future food shortages).

With regard to the FDS, farmers in some villages were positive, noting that the ploughing would enable them to get better yields. Others, however, said the FDS would not be helpful, because they could not afford the fees. Fielding et al. (2014) found that farmers were signing up in groups or via farmer associations. ABSL reports that 217 farmers have enrolled in the FDS as of October 2014; 32 households in the project villages we surveyed are in the FDS. As noted earlier, however, ABSL has expressed concern about its ability to meet all the demand for FDS services; there are also concerns about bringing new machinery to the area, given the high risk of theft and the lack of skilled personnel to repair broken machinery.

Overall, we found agricultural productivity to be a widespread concern. Many farmers in project communities said productivity had declined, citing a number of factors: less land is available (reported in four of the six project communities); the land being farmed now is less fertile than the farmland leased to ABSL (in Madora); there is not enough labour,

because all the men in the household are working for ABSL (in Malainka and Makeng). Notably, farmers in the control villages also reported declining yields, which suggests that other factors, unrelated to ABSL, may be at play.

A related concern in project villages was the loss of fruit trees and other perennial plantings, beyond the annual crops. Farmers in Madora, for example, reported losing their communal oil palm plantation. Although ABSL paid land owners for several seasons' estimated future production (as new plantings might take several years to bear fruit) and an estimated replacement value (see Section 3),— according to ABSL, communities have not actually planted new trees.⁵⁴

Similarly, most project communities reported that their access to fuelwood had been negatively affected by the land concession, saying fuelwood was generally less available (Madora focus groups), and took longer to access (Wareh Wanda women's focus group). Women in Makeng said they now have to navigate around ABSL's pivots in order to collect fuelwood. In general, with a larger share of the land around the communities actively in use, there are more limited areas where people can collect fuelwood, intensifying pressure on those resources. Women in Mayengbe suggested that the reduced access to traditional fuelwood sources was somewhat offset by the fact that ABSL allowed



Bundles of firewood in Madara, one of the villages in the Makeni Project area.

community members to collect the stumps from the land it cleared. Control communities also expressed challenges with securing fuelwood, however, saying that it is very time-consuming, and that there are problems with availability. Thus, it is difficult to know how much of the perceived scarcity is related to the land leases, and how much to population growth or other factors, including the degradation of natural resources in the landscape.

It is also unclear to what extent the Makeni Project has affected water availability – which, as noted earlier, has been a problem in these communities since well before ABSL arrived. The company is reportedly using about 2% of the Rokel River’s annual flow (Manley et al. 2010b), but it is unclear how this varies seasonally. Moreover, the RSB audit cited reports from three villages that pivot development disrupted the flow of natural springs they relied on in the dry season (RSB 2013).

The same is true of the water quality issues reported by villagers. While such problems are widespread across the region, we found they were much more frequent in the project villages (85% of households overall) than in the control villages (55% of households). The difference is statistically significant, and the result evenly distributed across the communities, but we do not have enough evidence to establish causation. Some community members said these problems pre-dated the Makeni Project, or blamed them on other business operations in the region, such as African Minerals and Magbass. However, in several communities, people attributed the problems to ABSL, reporting, for example, that ABSL’s land clearance and blockages

of the river has decreased the water quality, and that chemicals used by ABSL were contaminating the water in the rainy season.

As a Ministry of Water Resources official noted in an interview, government regulations require that companies offset any water issues they create for local communities by providing a clean alternate source of water. Focus groups in several communities said they expect ABSL to comply and provide new water sources. ABSL officials, in turn, said that “managing expectations” from the communities is an ongoing challenge. Infrastructure changes with implications for the water supply are discussed in the next section.

Changes in infrastructure

Remoteness can be a major constraint to the scaling-up of agriculture, as farmers find it difficult to access supplies and machinery, set up irrigation systems, and take their products to market. As noted earlier, the inadequacy of roads is a particular challenge in this region.

Improved infrastructure is one of the benefits associated with attracting foreign investment, and ABSL has developed a significant amount of infrastructure, including not only the plant, pivots and supporting infrastructure, but also roads. As of June 2014, ABSL had built an estimated 440 km of new roads.⁵⁵ Indeed, a report by one of the Makeni Project’s most prominent critics acknowledges this as a significant benefit, noting that although the roads’ main purpose is to facilitate ABSL operations, they are also used by community members, and they facilitate transportation within the area and connect it with the highway (SiLNoRF 2014).

As an ABSL official noted in an interview, the new roads mean that some villages have a “big, proper road” with associated traffic, near them for the first time. Improved access to roads has the potential to reduce isolation and improve market access. However, communities in the project area also told our research team that ABSL’s large, heavy trucks and machinery had seriously damaged local roads, particularly in the rainy season. In our RRA exercises, complaints about damaged roads far outnumbered mentions of the benefits of new roads (18 vs. 4 mentions).

The construction of new houses is perhaps the most visible change in the area, and was often mentioned by people living in both project and control villages (22 times altogether), as well as by ABSL and Swedfund officials. Our household surveys found 79 new houses were built in the project villages between

Proportion of matching households and new households

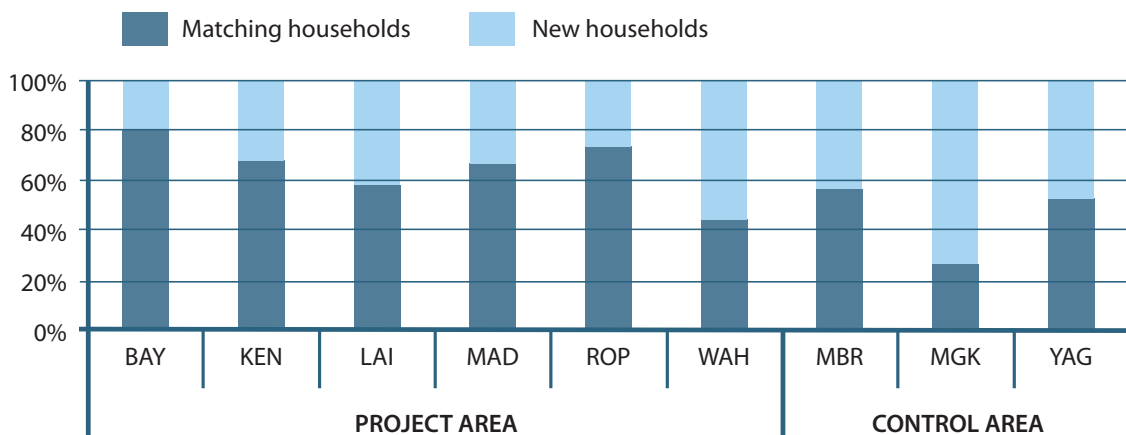


Figure 6: Proportion of matching and new households in April 2014 survey, relative to October 2013 survey.

October 2013 and April 2014, a 37% increase. ABSL and community members attributed the new construction to households having money from the land leases, compensation and ABSL wages. Some started by replacing the roof of their house, then went on to build a new house.

Another explanation given for the new housing was that the presence of ABSL has provided an opportunity to accommodate lodgers and earn cash from hosting people who come into the area to seek employment with ABSL. According to ABSL officials, there are many newcomers in the area, with both positive and negative effects. Demographic changes are further discussed below.

Focus group participants in Ropotor said there has been a considerable improvement in housing, including both upgrades and new homes. In the household surveys, we asked what their outside walls of houses were made of, and we saw a considerable shift to new and improved housing structures between October 2013 and April 2014 (not including new households in the area). Instead of stone and brick, households are building with cement and corrugated iron. New small commercial buildings and restaurants are also being added; one village was also getting connected to the mobile phone network via a new antenna. There is a general concern, however, that it is mostly houses that are being built, while there is little development in terms of schools, clinics and community centres. (Such community infrastructure would normally be the responsibility of local government and the chiefdoms.)



New houses and home improvements are visible in the villages. Above, Warrah Wanda.

New income sources and transition to wage labour

For many people in the project villages, the arrival of ABSL represented their first opportunity to engage in formal wage labour. In the project communities, 38% of households had at least one member who is receiving some income from employment with ABSL. Only 4% of survey respondents in both project and control villages are employed in wage labour outside ABSL, so the arrival of the company clearly represents a huge shift towards wage employment. (No one in the control communities reported working for ABSL.)

Wage labour can pose a range of challenges for former subsistence farming households. Jobs for

which farmers are qualified for are likely to be seasonal, so they may coincide with the rice planting and harvesting seasons. Unlike petty trade, crafts or other common cash-earning activities, employment by ABSL in this case is not an income diversification activity, but rather a change in how income is earned. Women in Makeng, for example, said agricultural productivity in the community has suffered because the men have left the fields to work for ABSL. Women in Malainka voiced similar concerns. Another worry expressed is that when the ABSL contract comes to an end, the family will be more vulnerable than it was before as crops won't have been planted.

Still, communities reported that employment with ABSL is good for incomes, and said household incomes had increased since the company's arrival. People in both project and control villages said small-scale farming was no longer a sustainable way of making a living, and that they were looking for additional opportunities. (Some said that farming would suffice if they had consistent access to good land, seeds and inputs.) We explored whether expenditure profiles differed between households in the project and control villages, and found that in the project site, a larger share of budgets goes to housing, while other expenses are relatively larger in the control villages.

Another potential set of benefits in projects such as ABSL's is that there will be opportunities to build capacity and gain transferable skills. In some project communities, parents reported that they can now better afford school fees for their children. However, some people said that young men were choosing wage-earning jobs over education; this came up in both control and project villages, and was not only driven by the Makeni Project. In fact, there is a strong trend across West Africa of rural youth migrating in search of work, usually to cities.

Another important dimension is how ABSL job opportunities are distributed across society. As shown in Table 2 in Section 3, women's share of local ABSL employment ranged from 8% to 12% in

2011–2013; as of December 2014, it was 10%.⁵⁶ At the same time, as men take ABSL jobs during the growing season, women said they are having to work that much harder on the fields. Several women said they wished for more opportunities to work with ABSL, and company decision-makers they would like to hire more women, as they see them as more reliable and more conscientious machine operators. However, they also reported that employing women had often caused problems with husbands, and speculated that many women were likely barred by their husbands from seeking jobs with ABSL.

Demographic changes

One of the salient issues raised in the environmental, social and health impact assessment that ABSL undertook before the launch of the Makeni Project (Manley et al. 2010b) was the expected influx of migrants seeking employment with ABSL. And indeed, community members and other stakeholders have seen changing population dynamics, driven primarily by ABSL job opportunities. The newcomers have different needs, and along with households renting out rooms, restaurants and shops are opening up to cater to this market. It should be noted, however, that our household survey found a greater change in households in the control communities than in the project communities (23.4% more new households, as shown in Figure 6 below).

Experiences with the changing population dynamics are mixed, but overall, communities appear to see more positives (e.g. new businesses and petty trade opportunities) than negatives. Some community members did, however, note increased competition for food and water and price inflation due to population changes. As discussed earlier, the water supply is already limited in the dry season, and this is likely to be aggravated by an influx of people without water infrastructure improving in parallel. Communities attribute the increased competition for food to the combination of population growth and constraints on agricultural production. It is not clear whether wages and general economic development have kept pace with the reported increases in the cost of living.

5 INCREASING THE BENEFITS OF AGRO-INDUSTRIAL FDI

The government of Sierra Leone, development finance institutions, and rural communities went into the Makeni Project with very high expectations, reflecting the widely held view that bioenergy and other agro-industrial investments can be powerful drivers of rural transformation. Our engagement with the communities, ABSL and other stakeholders suggests that while the project has brought benefits to the region, there have also been problems, and the potential for rural transformation has not yet been fully realized. This is of particular concern given ABSL's substantial efforts to make a positive impact on local communities; if a project held up as a "model" for sustainable FDI in Africa has such mixed results, it raises questions about the feasibility of using agro-industrial FDI to drive rural development in Sierra Leone.

The Makeni Project is still in only in its first few years, and it is not our study's purpose to judge, at this point, the project's overall merits. However, our analysis does raise several issues that may warrant attention not only from ABSL and other stakeholders in this project, but also from investors, policy-makers and others involved in planning and implementing this project and similar projects elsewhere. While

here we focus only on rural development aspects, we must stress that these are business enterprises, first and foremost. If ABSL is unable to make the Makeni Project profitable, it will not endure.

We begin by reviewing the implications for rural livelihoods of the change processes described above, and examine the roles of the public and private sector in those processes. We also reflect on how the Makeni Project or similar endeavours could contribute to other local needs, such as by boosting rural energy access or providing a modern bioenergy supply.

5.1 Implications for rural livelihoods

There is no question that rural transformation is occurring in the Makeni region – driven, to a large extent, by ABSL's activities, but also by other factors. The change processes we documented include new job opportunities and other sources of income, new infrastructure, improved housing, but also increased competition for already scarce natural resources. Those processes are interlinked in complex ways. Households may have more cash, for example, but they may also face steeper prices, and food insecurity



A vegetable garden in one of the villages. Growing vegetables has diversified diets and provided produce for sale.

remains a concern. The project's benefits are also not evenly distributed across communities, leaving the potential for both winners and losers.

The Farmer Development Programme (FDP) experience provides good examples of the challenges faced by investors, the government and civil society in ensuring that major agro-industrial projects benefit local communities. Developed as a food insecurity mitigation programme, the FDP has mostly succeeded at producing large quantities of rice to offset any crop losses due to the land concessions. Yet it is clear from both ABSL and community members' remarks that local buy-in has varied significantly, and it is by no means a given that, as they "graduate" from the FDP, farmers will maintain the high levels of agricultural productivity achieved with ABSL's support. Such a situation is common when weaning farmers off support programmes in developing countries where the institutions and governance mechanisms for formalized economic activity do not come in to fill the gaps.

As ABSL staff suggested in interviews, the FDP would likely have made a much greater impact on smallholder productivity and commercialization if, rather than engaging a cross-section of farmers in affected communities, it had focused resources on farmers who showed real interest in seizing this opportunity. While such an approach might have been more efficient, and more transformative for the farmers involved, it would have also concentrated the benefits among farmers who, arguably, were already better positioned to adapt to changing conditions. A blanket approach that mitigates negative impacts across the entire communities was thus a more viable option for minimizing the risk that ABSL's activities would lead to food insecurity in these villages.

Growing only rice also proved to be too narrow a focus for the FDP; some of the most promising results, particularly for women, have come from vegetable gardens. Thus, it is clear that if programmes such as the FDP are to serve broader development goals, and not simply mitigate risk, they may need to be designed more flexibly, taking more diversified approaches. Meeting both needs together, however, is always likely to be a delicate balancing act.

Another risk that needs to be addressed is that labour scarcity during the growing season will contribute to food insecurity. The arrival of ABSL is only one of a number of changes that have occurred in the region in recent years, and it is possible that villages just need time to adjust. Farmer associations, for

example, have always counted on all their members to contribute to the work during the agricultural season, and that is a key aspect of how the harvest is distributed. New communal systems may now need to be developed to ensure all needs are met, particularly during planting and harvest time. Despite having some access to markets locally and in Makeni, the food economy is still very much village-based, so the entire communities have a stake in ensuring that there is enough labour and organization to produce enough food to meet increasing demand.

A related consideration is whose responsibility it is to ensure that the transition to wage labour does not exacerbate food insecurity. Policy-makers tend to think in terms of multiplier effects, which in this case would imply a string of positive impacts from ABSL employment, as workers spend their wages at local markets and small businesses, which in turn boosts spending by those merchants, etc. Yet if there is not enough food locally, and if the assumptions of improvements in infrastructure that are associated with these positive impacts are not realized, the benefits will not accrue locally, but to those elsewhere who fill the gap. And if inflation and lack of access to markets steadily reduce workers' buying and selling power, their families could end up poorer than before. ABSL has sought to mitigate the impact of its land acquisitions, through the FDP, and the mechanization services provided by the FDS might help reduce the need for farm labour. But the impact of ABSL employment appears to be substantial enough to warrant active engagement by the public sector and civil society to help communities through the adjustment.

In this context, equity issues merit greater attention. It is clear that women have not benefited from ABSL's presence as much as men have. In fact, to the extent that they have to do extra farm work because the men are at ABSL, or they are spending more time collecting fuelwood and water, they may end up being worse off because of the Makeni Project. ABSL cannot change the cultural context in which it operates, but the company, government officials and civil society should all be mindful of these gender disparities, and look for ways to address them.

Also of concern are the landless people who worked as day labourers on others' farms prior to the project's arrival. They are more vulnerable to food insecurity and price inflation than households with farmland, and because they are poorer and less skilled, they may also have more difficulties securing employment with ABSL. Yet as more farmers transition to wage

labour, there could also be more opportunities for landless people to go work on their farms. It is important to ensure that conditions improve for these populations, rather than decline.

Finally, as discussed in Section 3, there is a significant gap between ABSL's labour needs and the skills and capacities available in local communities. We take no position on whose job it should be to fill this gap – there are arguments to be made for ABSL, the government, civil society and the workers themselves all having some responsibility. It is clear, however, that if the employment benefits of the Makeni Project are to accrue locally – instead of just attracting migrant labourers – more has to be done to match local people's skills with ABSL's needs. A crucial first step may be to assess the range of capacities that ABSL expects its work force to have, and to review whether structures are in place to build those capacities. Are existing programmes, such as the Farmer Field and Life Schools (FFLS), providing the right kinds of training? And is it possible for local people to gain the education and experience they would need to qualify not just for low-level jobs at ABSL, but for higher-paid positions, such as in management?

5.2 Outgrower opportunities

As discussed in Sections 3 and 4, one of the key benefits of biofuels projects envisioned by the Sierra Leone government was the chance for smallholders to become sugarcane outgrowers (SLIEPA 2010). This has also been an important motive for the DFIs. Outgrower schemes are seen as a key way to boost the commercial capacity of smallholders and thus improve rural livelihoods. They also ensure a broader and more equitable distribution of the economic benefits of commercial sugarcane production on what was previously local farmers' cropland.

Sugarcane outgrowers are common throughout sub-Saharan Africa, at a wide range of scales: from household plots under 1 ha to small commercial operations as large as 100 ha. In the more mature and technically advanced sugarcane industries of South Africa and Mauritius, outgrowers exist at different scales simultaneously. There is strong evidence from sub-Saharan countries showing that small-scale sugarcane production can be profitable compared with other agricultural activities in areas with suitable land and climate (Batidzirai and Johnson 2012). However, the terms of the deal can make a big difference: in some cases, the negotiated prices have



A woman in Kopotow, one of the villages in the Makeni Project area, is surrounded by local children.

been found to be too low, and when projects have failed, smallholders have sometimes borne the brunt of the losses (see, e.g., Lavers 2012). Women's ability to benefit may also be limited, given their restricted rights under customary law (Tsikata and Yaro 2014). Still, compared with existing options, it would likely be in local households' economic interest to become sugarcane outgrowers, if that became possible.

There could be benefits for ABSL as well – not only for public relations, but potentially in economic terms, at least in the long term. The administrative costs of operating a sugarcane estate are high, while in small-scale production, costs are effectively absorbed or co-managed within the households. Thus, an outgrower scheme could provide a useful addition to the existing production system, reducing administrative costs and also spreading the risks somewhat, since outgrowers would be directly affected by lower yields, just as ABSL would be.

In the near term, however, establishing an outgrower scheme would pose considerable transaction costs to ABSL, considering the low level of economic development and infrastructure in the region and local farmers' lack of experience with modern agricultural techniques and lack of agricultural business management skills. ABSL is keenly aware of these issues, and although the company included an outgrower scheme in its original plans for the Makeni Project, it has yet to move forward, due in part to the challenges that arose in the FDP.

Our research suggests, however, that more could be done to build those skills among local people, through the FDP or otherwise. As we have noted, many farmers worry that upon “graduating” from the FDP, they will return to the conditions before they enrolled, suggesting little increased capacity to cope with food insecurity or successfully diversify livelihoods. It has been difficult to get communities to take responsibility for the tending and harvesting, and to maintain the productivity levels achieved with ABSL support after “graduating” from the FDP. Still, there are some encouraging signs, such as the high demand for FDS services reported by ABSL, and the comments from farmers in our study that the FDS can help them boost productivity and improve yields. If these farmers who have embraced mechanization and increased input use are able to continue to develop their skills and knowledge, and reap economic benefits, they could potentially step into outgrower roles, and serve as models for others in their communities.

ABSL can help facilitate such a transition by sponsoring activities, through the FDP, the FDS or other programmes, that explicitly build the kinds of skills and knowledge needed to be a successful sugarcane outgrower. It could also build these skills among selected employees, providing a pathway from seasonal wage labour to small-scale commercial agriculture. Yet we must stress that it is not ABSL’s responsibility alone to do this. The public sector, civil society and the international investors backing the project all have vital roles to play in bridging this capacity gap. If an outgrower scheme is, indeed, crucial to maximizing the rural transformation benefits of the Makeni Project, and to achieving the Sierra Leone government’s goals in promoting biofuels and agricultural investments, all interested actors should be working to make it happen. This would likely involve technical agriculture-related training focused on soil health, nutrients, production techniques, etc., but also building agribusiness skills and literacy. All of which would contribute more broadly on poverty reduction and community development under the right context.

From a logistical perspective, ABSL could set up its outgrower scheme in a few different ways. As noted earlier, the ABSL operations are irrigated, and are adjacent to the nearby communities. One option to extend that production model to outgrowers would be to set up a group of perhaps 100 farmers, to be provided with an entire centre pivot, seed cane and other inputs, and then take responsibility for producing and harvesting the cane (mechanically or manually), and delivering it to ABSL for processing. An alternative would be to have outgrowers plant a different variety of cane that is suitable for rainfed production, most likely with manual

harvesting. The latter would likely have lower sucrose content, but also be produced at lower cost.

Another consideration is that unlike the typical situation in sub-Saharan Africa, ABSL’s operations are not producing any sugar, but only ethanol. The economic return from ethanol alone is different from that of sugar and ethanol combined; a detailed investigation would be needed to assess whether the quality of sugarcane produced by outgrowers using a rainfed system is compatible with the ethanol production model. Also, as discussed further below, in addition to ethanol, the ABSL facility is also producing electricity a significant share of which it sells to the national grid. This is an important part of the profit margin for ABSL; to be fair to the outgrowers, the price ABSL paid for the cane they delivered would have to include the value of the fibre (bagasse and other residues). There are few precedents for such payment schemes, so some analysis and negotiations would be needed to determine a fair price as well as a system for monitoring and measurement.

5.3 The roles of the public and private sectors

The Makeni Project is a prime example of the growing emphasis, by both national governments and the international community, on foreign direct investment as a means to advancing agricultural development as well as broader economic development goals (UNCTAD 2014b), especially in countries with very limited resources and substantial needs, such as Sierra Leone. To the extent that foreign investors can make a positive impact – through their regular business, corporate social responsibility activities, and/or required contributions – this is certainly worth encouraging. But no matter how good their intentions, these companies cannot replace the public sector. In fact, without an enabling policy environment and supporting public-sector investments, the transformative potential of private-sector investments will be diminished.

ABSL’s road construction efforts are a case in point. Roads are a public good, normally built and maintained by the public sector. Yet in Sierra Leone – and in the Makeni region in particular – this infrastructure is extremely limited. Thus, to support its operations, ABSL has built its own roads, which people in the surrounding communities are also able to use. However, ABSL’s road network is designed to meet the company’s needs, not those of the communities. In some cases, the roads bypass

communities (to prevent heavy machinery travelling through larger villages), and there is no connector road to the village centre.

ABSL has been criticized for “leaving roads unfinished”, but this is exactly the kind of situation in which the public sector could make all the difference. By stepping in to build as little as 50 metres of road, the government could leverage ABSL’s investment to connect a long-isolated village to an improved road network – and through it, to new markets and other opportunities. Yet the public sector has been so disengaged that not only is the potential unrealized, but it is ABSL that local people blame, not least because of its high visibility. In a country as poor as Sierra Leone, it is hardly surprising that so much is expected of ABSL relative to the government. However, in the long term, if the public sector does not increase its efforts, the neglect will not only harm local communities, but also discourage other investors from coming into the region.

The same is true with regard to water infrastructure. It is clear that access to safe drinking water is a priority for these communities, and in the past, the government and NGOs have built boreholes and wells. Many of the pumps are now in disrepair, however, and there is a substantial unmet need, which local communities expect ABSL to address. Certainly if ABSL operations in any way affect the quality of the water, or reduce the supply, it is incumbent upon the company to correct the problem. Beyond that, it is difficult to see why ABSL should take responsibility for building water infrastructure. Still, the government could work with ABSL to try to identify synergies between the company’s and local people’s interests. Such collaboration is critical to maximize the development benefits of FDI.

It is possible that Sierra Leone’s public institutions do not yet have the capacity to keep up with the rapid pace of ABSL’s activities, in which case development partners and NGOs may want to prioritize filling this gap. Another, more worrisome possibility is that ABSL’s presence has actually led government agencies – and even NGOs – to curtail their own activities in the area, on the assumption that ABSL will now cover local needs. If this is the case, corrective action is needed. Policy-makers may also want to take precautions to ensure this does not happen around other foreign investments.

A major governance challenge

Most of all, our study highlights the urgent need to strengthen governance and institutional capacity in

Sierra Leone – a common challenge in Least Developed Countries. When ABSL arrived, the government had very limited experience with foreign direct investment, and little understanding of how to support, steer or regulate it. ABSL actually played an instrumental role in developing the national policy frameworks to support the implementation of the Makeni Project. This raises the question of whether Sierra Leone officials had the capacity to assess different options for development and make an informed choice to pursue biofuels investment in the first place.

Without a diverse mix of projects to learn from, including ones with a more explicit focus on sustainability and poverty reduction, the government could find it difficult to explore alternatives in the future, as the experiences with ABSL and similar investors will be the only frame of reference. Lack of knowledge and experience within government departments is a serious limitation, and one with potential long-term sustainability and development implications on a national scale.

The role of the Sierra Leone Investment and Export Promotion Agency (SLIEPA), which the government created in an attempt to fill those gaps, also warrants further attention. As discussed in Section 2.3, SLIEPA was established under the Ministry of Trade and Industry to promote foreign investments, and it has worked steadily – and fairly successfully – to do so. Yet SLIEPA’s efforts are not necessarily aligned with the policy priorities of other agencies; for example, while the Ministry of Agriculture has emphasized commercialization of small-scale agriculture, a more “bottom-up” approach, SLIEPA has focused on attracting large-scale commercial investors. Agencies such as SLIEPA are highly valued by investors, donors and development finance institutions because they reduce bureaucratic hurdles, improve transparency, and generally make it easier to do business. However, such agencies also need to be fully integrated in the national government and its broader development agenda, with an administrative reward structure that reflects that agenda, and holds the agency and its officers as accountable to their own government as they are to investors and donors.

So how might Sierra Leone and other countries encourage foreign investments in agriculture that more effectively contribute to overall rural and agricultural development? As discussed earlier, substantial work has been done in Sierra Leone to address this question. The FAO has worked with government, civil society, businesses and investors, donor institutions, and community members to identify key concerns

around FDI, in bioenergy and more broadly, and identify potential solutions, and produced the 76-page draft Guidelines for Sustainable Agricultural and Bioenergy Investment (GoSL and FAO 2013).

Careful pre-screening of proposals for commercial viability is an important first step, and the guidelines lay out a detailed screening process. The FAO-led working group has also suggested staged investment – instead of large-scale projects such as Makeni, developing relatively small parcels of land and expanding over time to make the social, financial and logistical challenges more manageable. The guidelines also emphasize the importance of safeguarding local land tenure and human rights through partnerships and measures such as requiring that large transfers (i.e. above a specified ceiling) be subject to parliamentary approval. Implementing these guidelines would go a long way towards ensuring that investments are aligned with Sierra Leone’s development goals and benefit rural communities, but approval has stalled in the legislature, so the guidelines have yet to be implemented.

Considerably more needs to be done to improve governance at the subnational level. The fact that ABSL had to develop its own maps of the Makeni region and delineate property rights, because there was no official land registry, is particularly problematic. If a government is going to encourage large-scale, long-term land concessions to foreign investors, the minimum it should be able to do is ensure that property rights are well documented. Similarly, the near-complete absence of key government agencies on the ground suggests a lack of oversight of the Makeni Project and its local impacts. As a post-conflict nation, Sierra Leone clearly has great capacity challenges in this regard, which have likely been exacerbated by the Ebola crisis. International support may be needed to address this problem; based on our observations, it should be a priority.

Without strong government institutions, there is a huge imbalance of power between ABSL and local communities, to the detriment of both sides. Most discussions become oppositional, “big, strong company vs. small, weak farmer”, and not evidence-based or particularly productive. The level of hostility towards ABSL among certain local people is such that sugarcane fields have reportedly been sabotaged on several occasions. As both our field research and our review of NGO-backed reports on the Makeni Project showed, accusations of “broken promises” by ABSL are rampant, and they are likely to continue as long as there is no credible public-sector arbiter to

address and resolve conflicts. Government agencies need to step up to this responsibility; development finance institutions and donors can play an important role in enabling this by helping to build institutional capacity, at both the national and subnational levels.

We should note that, at the DFIs’ behest, the Makeni Project is subject to annual reviews by the “lenders’ independent environmental & social monitor”, Nippon Koei UK. The resulting reports provide useful documentation (Bisset and Driver 2012; 2013; 2014), and the monitors have asked some probing questions and offered constructive criticism, but the reviews are still mostly based on information provided mainly by ABSL itself. A similar situation arises with the sustainability certification provided through RSB. Thus, the claim that the project is monitored independently is somewhat weak, even if it conforms to standard practice. Future projects would benefit from a more robust approach to monitoring.

5.4 Expanding energy access

Our study has focused on the Makeni Project as an agro-industrial investment, but of course it is also an energy project, led by a company with nearly 30 years’ involvement in the energy sector.⁵⁷ As noted in the introduction, the ABSL facility is expected to produce about 85,000 m³ of ethanol per year, currently intended for export to the EU. It is also cogenerating electricity, from burning sugarcane fibre residues (bagasse), a highly efficient means of generating heat and power. Much of the power is for ABSL’s own operations, but 15 MW of capacity is expected to be available to feed into the national grid. For context, Sierra Leone’s total grid power generation in 2011 was 175,700 MWh (UNDP 2012), the majority of which comes from the Bumbuna Hydroelectric Project. Major additional power projects are in the pipeline, but for now, the Makeni Project’s relatively modest contribution could add up to about 20% of the power on the grid.

Yet at the local level, the impact of this major energy project on communities’ energy access has been virtually nil so far. None of the ethanol is staying in the area, nor is any of the electricity going to nearby villages, since there is no grid infrastructure. A comparison can be made to the growth in the small town of Bumbuna, next to the hydropower plant. A mini-grid was established there, fed by electricity from the dam, and this enabled a variety of small businesses to flourish, driving growth in the town. Little attention has yet been paid to this gap in Makeni.



Children gather around a mango tree in Malawi as ripe fruits are picked.

As emphasized by the UN Secretary-General's Sustainable Energy For All initiative,⁵⁸ access to a modern, sustainable energy supply is essential for development: "It enables businesses to grow, generates jobs, and creates new markets. Children can study after dark. Clinics can store life-saving vaccines. Countries can grow more resilient, competitive economies." Could the Makeni Project, or future bioenergy investments, make substantial contributions to energy access in rural communities? Although it is not the responsibility of ABSL to provide energy access, below we explore some options that might be pursued, perhaps in some kind of public-private partnership.

Local ethanol use and household market

One way in which ABSL could contribute to improved energy access in the surrounding villages would be to sell some ethanol locally, as a less-polluting alternative to cooking with wood or charcoal. Such a development could reduce pressure on trees in the area and help to restore the area to a healthier landscape. Greenhouse gas emissions from local fuel use would also be reduced, as wood and charcoal require more land per unit of energy delivered than sugarcane ethanol.

Health improvements would also likely be observed, as ethanol burns more cleanly – although the impact of smoky stoves is less severe here than in colder climates, since cooking is often done outdoors. Economic productivity would improve as well, as women would not have to spend long hours collecting fuelwood, and instead could spend the time with their families or engage in income-generating activities.

Supplying 10,000 households with enough ethanol to cook for a year would require roughly 3–5 million litres of ethanol, which is about 3–4% of ABSL's expected annual production. The scale of supply is thus not a barrier, although it might not be in ABSL's financial interest to sell ethanol locally if available export prices to the EU or elsewhere are higher. Another option would be to link or coordinate the creation of local ethanol markets for household cooking with the development of small-scale outgrowers. Such local ethanol initiatives have been pursued in recent years in several African countries (e.g. Ethiopia, Kenya, Mozambique, Nigeria), but uptake has been slow due to the higher cost of the stoves and the fuel (Souza et al. 2015).

The demand side poses much greater challenges. First of all, households would have to pay for the stoves and fuel, a potentially significant economic burden given that now they collect fuelwood for free. Another barrier would be socio-cultural, as people in these communities have never cooked with ethanol and do not know anyone who does. This could make it difficult to persuade households to switch, even if the price were reduced or subsidized. While some African countries have extensive experience with improved cookstoves and are increasingly promoting clean cooking fuels, little such activity has occurred in Sierra Leone.⁵⁹

In fact, when asked as part of our surveys whether they would be willing to switch to a different cooking fuel, households across both project and control areas overwhelmingly said no; only about one in six would consider it. This is a common challenge, however, and it can be overcome through careful market research and engagement with households. Notably, although Sierra Leone's National Energy Policy (GoSL 2009) does not mention ethanol as a cooking fuel option, it does make it a priority to offer cleaner alternatives to wood and charcoal, including liquefied petroleum gas (LPG). Given how little LPG is used for cooking today, promoting ethanol instead – a renewable fuel that does not need to be imported and burns just as cleanly – would be preferable, in both environmental and energy security terms.

Electricity availability

As noted above, none of the electricity produced by the Makeni Project is going to local users, as there is no grid infrastructure. The Sierra Leone government is actively working to expand the grid nationwide, and improvements have been made in the Makeni region in particular (UNDP 2012), but it could take many years for these villages to be connected. In the meantime, local access to electricity could potentially be increased through off-grid solutions or construction of a mini-grid.

Other options could include the establishment of charging stations connected to the ABSL power supply, and/or distribution of portable electric lanterns. One advantage of electric lanterns is that people in rural households who have a small business in town could use the lanterns both at home and at work, potentially enhancing income-generating activities. While the people we surveyed did not necessarily envision using electricity in their households, they were clearly interested in it for income generation. Unlike ethanol stoves, electricity is something people in these villages are familiar with, and they understand the benefits.

Fuel blending in the transport sector

ABSL's business plan is based on export of ethanol to the EU, where there is demand due to legislation calling for 10% of the transport sector's energy use to come from renewable sources by 2020.⁶⁰ ABSL should be cost-competitive compared with European sources of ethanol, and as discussed earlier, as a Least Developed Country, Sierra Leone qualifies for duty-free imports into the EU. However, demand from EU markets could shift, particularly due to growing concerns about the use of biofuels from food crops. In this context, it is worth considering whether there is a viable domestic market for ethanol for transport.

Sierra Leone now depends on imported petroleum products to fuel transport – 266,248 tonnes in 2011, all as refined products, as the refinery in Freetown shut down (UNDP 2012). As the National Energy Policy notes, this dependency, plus “a dearth of foreign exchange, and heavy debts to oil companies, frequently led to fuel shortages in the past” (GoSL 2009, p.19). Both for energy security and as part of a long-term commitment to renewable energy, an introduction of ethanol blending into gasoline could have some advantages. The current supply from ABSL would easily accommodate blending in Sierra Leone at a level of 10%, requiring just 17 million litres,⁶¹ which is about 20% of the Makeni Project's total expected annual output of 85 million litres. Another branch of ABSL's parent company, Oryx Energies, is already involved in the country's petroleum products market, through Petrol Leone, a joint venture with Leonoil that manages strategic oil storage facilities in Freetown.⁶²

Sierra Leone does not currently mandate biofuel blending, and although the government has expressed a strong interest in diversifying the country's energy supply and reducing dependence on petroleum imports, national policies remain fairly vague in their treatment of biofuels. In fact, the National Energy Policy only mentions biofuels once, setting a goal for the transportation sector to “explore the feasibility and viability of using biofuels and hydrogen” (GoSL 2009, p.51). Much has changed since the policy was approved, of course – not only in terms of foreign investment in biofuels projects, but also in the government's awareness of biofuels as a domestic energy resource. The Agenda for Prosperity, the country's most recent Poverty Reduction Strategy Paper (GoSL 2013), calls for exploring “the potential use of biofuels such as biodiesel from palm oil or ethanol for domestic consumption”, though it does not go into further detail.

6 CONCLUSION: SEIZING OPPORTUNITIES

Sierra Leone has worked to attract foreign direct investment as a development strategy, and has highlighted bioenergy as a priority sector for its potential to advance rural development. Yet one of the most important lessons from bioenergy projects around the world is that good governance is crucial to achieving sustainable development benefits, and to ensuring that the rural poor share in those benefits and are not harmed (see, e.g., Souza et al. 2015).

Our research suggests that Sierra Leone's institutions are not yet up to that task. There are draft Guidelines for Sustainable Agricultural and Bioenergy Investment (GoSL and FAO 2013) awaiting approval by the Parliament, but as the delay in approving them gets longer, SLIEPA continues to court new investors, and the inadequacies in the current system persist. This is a vacuum that needs to be filled – both to ensure that new projects are systematically evaluated and monitored, and to provide clear standards to guide public servants and prospective investors. If the guidelines are approved in their current form, then it is also essential that to train staff at all relevant agencies so they understand the implications of the guidelines and their role in applying and enforcing them. As individual projects are approved, additional agencies may need to be engaged – from the Ministry of Energy-, to the Ministry of Water Resources, to local agricultural extension offices under MAFFS – to oversee specific aspects of the project in a coordinated manner. This will require regular site visits and consultations with local residents and other stakeholders.

Improving oversight would not only help protect vulnerable communities but it would provide solid evidence to hold investors accountable for upholding their commitments. It would also help identify opportunities to advance rural development and show where public investments could complement ABSL investments in synergistic ways. As discussed in Sections 4 and 5, ABSL has built extensive infrastructure, including more than 400 km of roads. In some cases, as little as 50 more metres of road might make a huge difference for a village, providing a vital connection to markets and key services. Similarly, it might be feasible to build a mini-grid and connect it to ABSL's power plant, dramatically improving energy access.

As Karlsson (2014) notes, agricultural FDI can complement and stimulate development, but public investments are essential to unlocking their potential. Complementing ABSL's work with small, targeted

investments aimed at driving rural transformation in the Makeni region would yield outside benefits, much greater than an equal investment elsewhere. As mentioned above, a mini-grid connected to the ABSL plant, for example, would cost far less and be far more reliable than a mini-grid which has to generate its own power from solar or hydro. And given that people in these villages now have more cash – from the land leases, wages and increased petty trading – if they had electricity, they might also be able to afford more valuable equipment, such as a refrigerator or equipment to process crops.

The same is true for the FDP, the FDS, and related community development activities. ABSL has already made substantial investments to boost farmers' skills and to make modern equipment and inputs available (even if farmers have to pay part of the costs). If the government, international organizations or NGOs stepped in to supplement these efforts, they could greatly accelerate progress towards smallholder commercialization.

Similarly, targeted public investments could help local people take advantage of ABSL employment opportunities that are now going to more highly skilled outsiders. ABSL has provided some basic instruction as part of the FDP, but that is not tailored to the company's recruitment needs, but to a standardized "local situation". Programmes to train workers for different levels of employment at ABSL – from basic courses to a more in-depth curriculum at the University of Makeni – would enable local people to compete for better-paying, year-round jobs.

The Sierra Leone government does not yet have the capacity, or the resources, to fill all these gaps on its own, but by more actively engaging with ABSL – and the developers of other projects – it could start to identify opportunities that are now being missed, a key first step. Officials could then reach out to international organizations, donors, development partners and/or NGOs to create connections necessary to help them fill the gaps.

The development finance institutions could also make a significant impact here. In ABSL's case, the DFIs played a crucial role in ensuring a thorough review of the Makeni Project before it began, and in monitoring progress. Yet while this has worked fairly well to mitigate risks, it is less effective at maximizing development benefits. Future projects could do better by proactively planning to pursue the kinds of

opportunities discussed above, in partnership with the government, NGOs and other stakeholders. Some complementary activities can be planned at the outset, but the project design should also be flexible enough to seize new opportunities as they arise.

At least as important is to invest in institutional capacity-building. Least Developed Countries such as Sierra Leone face a difficult challenge: they sorely need FDI to boost their economies, but their institutions are poorly equipped to deal with large investors. One could argue that they should avoid large-scale FDI projects until they are prepared to handle them, but that is unrealistic. Instead, both the countries and their development partners should make it a priority to strengthen governance, with particular attention to regulatory structures, technical know-how, and effective coordination among key agencies. This is crucial not only from a development perspective, but to ensure that FDI projects can succeed as businesses. Having lost much of its economic momentum with the Ebola crisis, Sierra Leone cannot afford to lose further investors due to poor governance.

Careful monitoring and evaluation of projects is also essential. Sierra Leone is still learning what works, how best to leverage FDI to advance development goals, what pitfalls to avoid. As the first and largest investment of its kind in the country, the Makeni Project has already provided valuable lessons that government officials say helped them deal more effectively with other investors. Yet much more remains to be learned, from Makeni and from similar – and completely different – projects being implemented across the country. By comparing approaches and outcomes, in consultation with experts and with the investors themselves, the government can refine its policies and programmes over time. Sharing lessons and best practices with other African nations, perhaps under the auspices of the Comprehensive African Agriculture Development Programme (CAADP), could also be very valuable.

6.1 An agenda for further inquiry

Although the SEI project that resulted in this report has now been completed, we intend to continue our work with the Makeni Project. Our first priority is

to engage directly with ABSL, the Government of Sierra Leone and some of the NGOs that are active locally. We want to collaborate with them to return to the region and discuss our findings with local chiefs, selected groups of farmers, and other stakeholders. We are particularly interested in engaging more with farmers who have championed the opportunities created by the Makeni Project, to try to identify what intrinsic traits, and what external conditions, make them different.

We also plan to explore the potential for adding an outgrower scheme to the Makeni Project, and also to look more in depth at energy access issues. In particular, we would like to compare conditions in the area surrounding the Bumbuna Hydro-Electric Station and those surrounding the ABSL plant, to understand what enabled the development of a mini-grid and what kind of benefits can be achieved by providing electricity.

We cannot ignore the Ebola outbreak. It has caused as much devastation in many communities as the civil war did in the previous generation. Have major private investments made the communities more or less resilient? Has Ebola made communities more vulnerable to potential negative impacts from large-scale FDI projects? And as Sierra Leone begins to recover, what role will companies such as ABSL play in the process? Can the Makeni Project itself withstand the impact of the Ebola crisis?

Finally, in collaboration with RSB, we would like to explore the possibility of “ground-truthing” the bioenergy investment standards. As we noted in the introduction, when the Makeni Project went through the certification process, it received a glowing review, with RSB calling it “a model for sustainable projects in Africa”. In practice, however, our research suggests that the project’s development benefits have yet to match the DFIs’ expectations. What does this mean for the RSB standards? Do they need to be adjusted? Is it possible to devise a methodology that fully accounts for all possible issues and impacts that may arise with a large-scale agro-industrial project in a developing country? Or is it the expectations that need to be adjusted? These are difficult questions that warrant much closer examination.

ENDNOTES

- 1 Update on Addax Bioenergy operation in Sierra Leone, 24 June 2015, available at <http://www.addaxbioenergy.com/en/news.php?pages=1&idnews=38>.
- 2 Unless otherwise noted, the technical specifications of the project site are taken from the Addax Bioenergy website, <http://www.addaxbioenergy.com/en/the-makeni-project.php>, supplemented by personal communications with Jörgen Sandström, executive officer for business development and external relations at ABSL.
- 3 Personal communication by Jörgen Sandström, ABSL, 16 January 2015.
- 4 See RSB (2013). Addax Bioenergy earns first African certification by Roundtable on Sustainable Biofuels (RSB). RSB Services Foundation press release, 28 February. http://www.addaxbioenergy.com/uploads/PDF/February_%202013_Addax_Bioenergy_RSB_Certification_Press_Release_FINAL.pdf.
- 5 See Elmia AB (2014). Commercial bioenergy venture in Africa wins the 2014 World Bioenergy Award. World Bioenergy 2014 news, 6 March. <http://www.elmia.se/en/worldbioenergy/For-press/news-from-world-bioenergy-not-seen/Commercial-bioenergy-venture-in-Africa-wins-the-2014-World-Bioenergy-Award/>.
- 6 European Parliament (2015). Parliament supports shift towards advanced biofuels. Press release, 28 April. <http://www.europarl.europa.eu/news/en/news-room/content/20150424IPR45730>.
- 7 Numbers given include confirmed, probable and suspected cases, per the World Health Organization (WHO) situation summary for 15 July 2015. <http://apps.who.int/gho/data/view Ebola-sitrep Ebola-summary-latest?lang=en>.
- 8 World Bank country overview for Sierra Leone, accessed 15 July 2015. <http://www.worldbank.org/en/country/sierraleone/overview>.
- 9 Unless otherwise noted, data cited here are from the World Bank's World Development Indicators database; GNI is given in current USD, Atlas method, then in current international dollars, PPP. When measured in constant 2011 international dollars, PPP, the GNI improvement is less dramatic: from 1,059 USD in 2002, to 1,640 USD in 2013. See <http://databank.worldbank.org>.
- 10 See Fofana, U. (2014). Mining spurs Sierra Leone to 20 pct GDP growth in 2013 – IMF. Reuters, 3 April. <http://www.reuters.com/article/2014/04/03/leone-imf-gdp-idUSL5N0MV37J20140403>.
- 11 See <http://www.transparency.org/country/#SLE>.
- 12 The strategy notes that 650 MW of the target capacity would be to meet projected demand from mining companies, and the rest for households and businesses (GoSL 2013).
- 13 2011 data from FAOSTAT; see <http://faostat3.fao.org/browse/area/197/E>. The government's estimate of arable land is much higher, 5.44 million ha, or 75% of Sierra Leone's total land area; by that estimate, only 11% of arable land is now under cultivation (see Mansaray n.d.)
- 14 The plan was also Sierra Leone's contribution to the Comprehensive Africa Agriculture Development Programme (CAADP) Compact under the African Union's New Partnership for Africa's Development, which provides a unified policy framework around development goals for African countries, including agricultural transformation, food security and nutrition, and economic growth.
- 15 Notably, the Makeni Project, included in the 2011 figures, helped make that a record year for FDI in Sierra Leone, with a total of 950 million USD invested (UNCTAD 2014b).
- 16 ABSL was already active in Sierra Leone when the campaign was launched, and SLIEPA set out to attract "five more investors like Addax" – two in sugar and three in oil palm (SLIEPA 2010).
- 17 The benefits apply to foreign investors who irrigate at least 500 ha, cultivate at least 2,500 ha, or invest at least 1 million USD in livestock and livestock products; domestic investors qualify if they irrigate at least 100 ha, cultivate at least 500 ha, or invest at least 500,000 USD. See <http://www.investsierraleone.biz/index.php?l=english&p=31&pn=Agriculture>.
- 18 See, e.g., Baxter (2013) and IRINnews (2012). Sierra Leone: Land deals beginning to stir discontent. 20 March. <http://www.irinnews.org/report/95112/sierra-leone-land-deals-beginning-to-stir-discontent>. For criticism of FDI incentives more broadly, see, e.g., Provost, C. (2014). Sierra Leone tax breaks put foreign investment ahead of poor, say NGOs. *The Guardian*, Global Development, 15 April. <http://www.theguardian.com/global-development/2014/apr/15/sierra-leone-tax-incentives-foreign-investment-before-poor-ngos>.
- 19 Basic profile information for Bombali is taken from the District Council's website: <http://bombalidc.org>.
- 20 See <http://www.eu-africa-infrastructure-tf.net/activities/grants/bumbuna-phase-ii-hydro-electric-project---sierra-leone.htm>.

- 21 See <http://www.african-minerals.com/our-company/company-factsheet>.
- 22 For an overview of Tonkolili, see the District Council's website: <http://tonkolili.com/ourlocation.php>.
- 23 Centre-pivot systems use a long arm on wheels that rotates around a central pivot, providing irrigation and fertilization over a circular area.
- 24 Land areas given are based on a personal communication from Jörgen Sandström, ABSL, 16 January 2015.
- 25 The price set for water removals from the Rokel, 3 Leone (about 0.007 USD) per cubic metre, has been dismissed as "negligible" (Baxter 2011), but as discussed in Section 2, Sierra Leone has offered free water to bioenergy investors. RSB (2013) reports that ABSL proposed the payment, "which is believed to be the first case of river water having been paid for in Sierra Leone".
- 26 Personal communication by Jörgen Sandström, ABSL, 27 May 2015.
- 27 The total rent per ha is thus 12.35 USD (adjusted for rounding). Calculations by the authors, verified against other project documents.
- 28 The process is discussed at length in an audit report in response to challenges to ABSL's RSB certification (RSB 2013), which also addresses numerous allegations that ABSL made lofty promises to local communities. The auditors find it is "not possible to comment" on allegations of false promises, given the time elapsed, the number of discussions, and the many different actors involved.
- 29 In the absence of standard rates set by the government, ABSL set the payment schedule through consultations with MAFFS and community members (Manley et al. 2010a).
- 30 The calculation is based on FAO in-country statistics on crop yields and food requirements (Manley et al. 2010b).
- 31 Personal communication by Jörgen Sandström, ABSL, 19 May 2015.
- 32 The review, the 2011 Annual Independent Public Environmental & Social Monitoring Report prepared by Nippon Koei UK on behalf of the lenders to ABSL, notes that when preparing a new "Block" of land for planting sugarcane, ABSL tried to avoid rice-growing lowlands (bolilands). "When this cannot be avoided, ABSL waits until after the harvest (usually, October/November) before entering rice-growing areas. Therefore, in the first phase of Block development, there is no dependency on FDP harvests. In the next phase, when some rice-growing areas may have been utilised for sugarcane, the FDP rice planting is undertaken at the same time as that of local farmers. The two harvests complement each other and provide a buffer against external 'shocks' that might affect one or both harvests. A failure, of whatever scale in one harvest does not mean, necessarily that there are adverse food security impacts on local people. A failure in the FDP harvest reduces planned food security levels (which are higher than baseline) and reduces the expected benefits that local people had hoped to accrue from enhanced rice production. Thus, the effects may be considered to be adverse, but only in the sense that improvements are less than were expected. In no case, has the food security situation in a village been less than the project implementation baseline due to a FDP failure" (Bisset and Driver 2012, pp.6–7).
- 33 As we will discuss later in our analysis, this suggests that the FDP may not be building as much capacity as intended, but rather that it is functioning as a food aid programme, simply supplying rice.
- 34 Personal communication with Derek Higgo (former ABSL plant manager), 3 December 2012.
- 35 May 2014 figure taken from the ABSL website: <http://www.addaxbioenergy.com/en/the-makeni-project/facts-and-figures.php>. December 2014 figure is from a personal communication from Jörgen Sandström, ABSL, 16 January 2015.
- 36 This issue arose several times in discussions with ABSL and was examined in the RSB (2013) audit as well.
- 37 Another significant challenge is discussed in Section 6: the fact that seasonal employment opportunities with ABSL overlap with the growing season for local food crops.
- 38 Personal communications by Jörgen Sandström, 16 January and 28 May 2015.
- 39 Update on Addax Bioenergy operation in Sierra Leone, 24 June 2015, available at <http://www.addaxbioenergy.com/en/news.php?pages=1&idnews=38>.
- 40 See <http://www.progressoutofpoverty.org/ppi-construction>.
- 41 According to Schreiner (2011), the Sierra Leonean national poverty line is defined as average total expenditure (food plus non-food) for households whose food expenditure is with $\pm 10\%$ of the food poverty line (Greenwell, 2005). For Sierra Leone as a whole, the national line is 2,363 SLL per adult equivalent per day, giving a household-level poverty rate of 61.9% and a person-level rate of 66.3%.
- 42 See <http://www-01.ibm.com/software/analytics/spss/>.

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- 43 See <http://atlasti.com>.
- 44 In 2005 dollars, purchasing power parity (PPP).
- 45 Per Schreiner (2011), Sierra Leone's food poverty line is defined as the cost of 2,700 kilocalories from a food basket consistent with that consumed by the poorest 20% of people in the 2003/4 Integrated Household Survey.
- 46 See the FAO Food Security Statistics web page: <http://www.fao.org/economic/ess/ess-fs/en/>.
- 47 See <http://www.wfp.org/countries/sierra-leone/food-security> (October 2013 update, retrieved 19 March 2015).
- 48 National data indicate that 42% of Sierra Leoneans' daily caloric intake comes from rice; cassava provides 10%, and palm oil, 9%; animal products account for only 4%. Malnutrition is widespread; a third of children are stunted, and 10% are wasting (FAO 2013a).
- 49 Notably, an ABSL socio-economic monitoring survey in 2012 found a marked decline in livestock ownership since 2010, even as households reported significant improvements on other fronts: monthly income, mobile phone and radio ownership, access to improved sanitation facilities (see Bisset and Driver 2013). No reason is given for this change, and we cannot discern one based on our own research.
- 50 This is evidenced in project descriptions on the World Bank website.
- 51 Air pollution was identified as an environmental risk; ABSL was also found to be taking enough mitigation measures to minimize impacts (Manley et al. 2010b).
- 52 FSAs were already operating in the Makeni Project area prior to ABSL's arrival. To learn more about their interaction with ABSL programmes, see Fielding et al. (2014).
- 53 Personal communication by Jörgen Sandström, ABSL, 19 May 2015.
- 54 Personal communication by Jörgen Sandström, 23 May 2015.
- 55 Personal communication by Jörgen Sandström, 27 May 2015.
- 56 Personal communication by Jörgen Sandström, ABSL, on 16 January 2015.
- 57 For an overview, see: <http://www.aoginvest.com/en/aog-energy.php>.
- 58 See <http://www.se4all.org/our-vision/>.
- 59 For an overview from the Global Alliance on Clean Cookstoves, see <http://cleancookstoves.org/country-profiles/35-sierra-leone.html>. The GACC website also lists at least two projects in Sierra Leone, including one – by Afrigas (SL) Limited – that is promoting the use of liquefied petroleum gas (LPG) for cooking. However, it is unclear whether these projects are reaching rural areas, or just urban centres.
- 60 For an overview, see: <http://ec.europa.eu/energy/en/topics/renewable-energy/biofuels>.
- 61 Calculated using a 70% energy basis for ethanol/gasoline and based on the 2011 Sierra Leone national gasoline consumption of 120 million litres per year (UNDP 2012; converted from 93,200 toe).
- 62 See <http://www.oryxenergies.com/en/country-presence/sierra-leone.php>.

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ANNEX 1: SUMMARY OF INTERVIEWS

Table A1: Field survey summary

	Community	Chiefdom	First Survey		Second Survey			
			Total	Date	Total	Female	Male	Date
Project area	Mayengbe	Malal Mara	48	14-17 November 2013	46	7	39	29-30 April 2014
	Makeng	Bombali Sheborah	31	20-22 November 2013	31	4	27	8-10 April 2014
	Malainka	Malal Mara	54	22-25 November 2013	50	12	38	13-16 April 2014
	Madora	Malal Mara	48	12-14 November 2013	51	8	43	1-3 May 2014
	Ropotor	Bombali Sheborah	20	29-30 October 2013	19	4	15	6-8 April 2014
	Wareh Wanda	Makari Gbanti	14	23-26 October 2013	18	2	16	1-3 April 2014
Control area	Mayemberai	Makari Gbanti	28	4-6 November 2013	28	9	19	7-8 May 2014
	Magbaikolie	Makari Gbanti	43	6-8 November 2013	48	7	41	9-11 May 2014
	Mayagba	Paki Masa-bom	40	27-29 November 2013	40	11	29	21-23 April 2014

Table A2: Summary of interviews

[Organizations and positions listed are at the time of the interview. Titles may have changed since then.]

Name	Organization	Position	Date	Location
Derek Higgo	Addax Bioenergy	HSSE Manager	3 December 2012	Makeni
Clive English	Addax Bioenergy	Senior Social Manager	4 December 2012	Makeni
Lloyd Clark	Addax Bioenergy	Environment Manager	4 December 2012	Makeni
-	Sierra Leone Government	Senior District Officer	5 December 2012	Makeni
-	CSUPAD	Representative	5 December 2012	Makeni
Rev. Dr. Joseph Turay & Adam Goguen	University of Makeni (UNIMAK)	Vice Chancellor & Registrar	5 December 2012	Makeni
Mohamed Conteh	SiLNoRF	National Coordinator	5 December 2012	Makeni
Yeroh Baldeh	African Development Bank	Resident Representative	6 December 2012	Freetown
Giampero Muci	Delegation of the European Union in Sierra Leone	Rural Development and Environment Officer	7 December 2012	Freetown
Lidia Martinez	FAO-SL	Program Implementation Officer - BEFS	7 December 2012	Freetown
Niyi Robbin-Coker	Ministry of Energy & Water Resources	Government Minister	7 December 2012	Freetown
Lahai Samba Keita	Environment Protection Agency - SL	Assistant Deputy Director	7 December 2012	Freetown
Kolleh Bangura & Momodu Bah	Environment Protection Agency - SL	Representatives	7 December 2012	Freetown
Prof. Ogunlade Davidson	University of Sierra Leone	Department Head	8 December 2012	Freetown
Jörgen Sandstrom & Simon Cleasby	Addax Bioenergy	Executive Officer & CEO	20 March 2013	Geneva
Love Hammond	Addax Bioenergy	Farmer Development Programme Manager	26 March 2013	Freetown
Jörgen Sandstrom	Addax Bioenergy	Executive Officer	23 August 2013	Stockholm
Joseph Brima	FAO - SL	Assistant FAO Representative	8 September 2013	Freetown
Jörgen Sandström & David Mwesigwa	Addax Bioenergy & FAO-SL	Executive Officer & Head of Program Implementation	29 September 2013	Freetown
Jatou Jallow	Environment Protection Agency - SL	Director	14 October 2013	Freetown
Alie Mansaray	Ministry of Agriculture, Forestry and Food Security (MAFFS)	Deputy Minister for Agriculture	14 October 2013	Freetown
Gabriel Rugalema & David Mwesigwa	FAO - SL	FAO Representative & Head of Program Implementation	14 October 2013	Freetown

Sam Goba	Ministry of Energy & Water Resources	Official	16 October 2014	Telephone
Mohamed Ajuba Sheriff	MAFFS	Assistant Director of Planning Evaluation Monitoring	17 October 2014	Telephone
Victor Bangura	Sierra Leone Investment and Export Promotion Agency (SLIEPA)	Investment Promotion Manager	17 October 2014	Telephone
Yero Baldeh	African Development Bank	Resident Representative	17 October 2014	Telephone
Adolfo Cires Alonso	Delegation of the European Union in Sierra Leone	Programme Manager Rural Development, Food Security and Environment	16 October 2014	Telephone
Jörgen Sandström & Reiner Bulstra	Addax Bioenergy	Executive Officer & Business Development Officer	21 October 2014	Geneva
Kristin Sjöblom, Lina Algerin, & Lars-Olle Larsson	Swedfund	All Senior Managers	28 October 2014	Stockholm

ANNEX 2: HOUSEHOLD SURVEY QUESTIONNAIRE (2014 VERSION)

Community name _____

Name of the household head _____

Name of interviewer _____ Date ____ / ____ / 2014

Problems with interview ()

Sex: M / F

Question	Value	Points	Score
1. How many members does the household have?	A. Ten or more B. Seven, eight, or nine C. Six D. Five E. Four F. One, two, or three	A=0 B=9 C=13 D=16 E=21 F=28	
2. Are all household members ages 6 to 13 in school now?	A. No B. Yes, or no one is aged 6 to 13	A=0 B=5	
3. What was the activity of the female head/spouse in her main occupation in the past 12 months?	A. No female head/spouse B. Agriculture, forestry, mining, or quarrying C. Other, or does not work	A=0 B=3 C=9	
4. How many rooms does the household occupy (exclude bathrooms, toilets, kitchen, pantry, hall, and storage)?	A. One B. Two C. Three or more	A=0 B=4 C=7	
5. What is the main flooring material?	A. Earth/mud, stone/brick, or other B. Wood, or cement/concrete	A=0 B=3	
6. What is the main construction material of the outside walls?	A. Stone/burnt bricks, or other B. Mud/mud bricks, or wood C. Cement/sandcrete, or corrugated iron sheets	A=0 B=11 C=14	
7. What type of toilet is used by the household?	A. Bush/river, none or other B. Bucket, common pit or VIP C. Private pit, common flush or flush toilet	A=0 B=1 C=7	
8. What is the main source of lighting for the dwelling?	A. Generator, kerosene, gas lamp, candles/torch light, or other B. Electricity	A=0 B=6	
9. What is the main fuel used by the household for cooking?	A. Wood, or other B. Charcoal C. Gas, kerosene, or electricity	A=0 B=4 C=6	
10. How many radios, radio cassettes, record players, or 3-in-1 radio cassettes do members of your household own?	A. None B. One C. Two or more	A=0 B=4 C=14	
		TOTAL SCORE:	

11. What are the household sources of income? (Please circle all the relevant categories)

- a) Subsistence farming
- b) Agriculture labouring
- c) Employed by Addax (explain what type of employment) _____
- d) Trading of goods
- e) Formal employment
- f) Crafts/ Skilled
- g) Remittances
- Others(Please specify) _____

What are the major household expenditures? (**Rank** items, largest to smallest)

(a)What are the major crops you plant?

For food

For cash

b) What crops do you buy? _____

a)Which are the specific months in the past three years in which you **did not** have enough food to meet the household needs? (Please circle all the relevant answers)

June

July

August

September

October

No shortages

Other

Please explain why _____

15. In times of food shortage, what do you do?(circle one or more alternatives)

Eat less preferred or cheaper foods

Get help from a friend or relative

Eat less food

Pay more for food

No shortages

Other (please specify) _____

16A) Do you have electricity in your house? **Yes / No**

B) If YES, what do you use it for? _____

C) TO ALL: What could you use the electricity for to improve your livelihood?

17. A) Which fuels does your household use for cooking? **Rank** the fuels (largest to smallest use)

- 1.
- 2.
- 3.

B) How much fuel does the household use per day?

	Bundles	Bags	Free	Bought	Price
Charcoal					
Fuel wood					

C) Do you face any problems when you use these fuels?

If yes, please mention

Fuel	Problem

18. How much time do you spend on fetching fire wood per day (only for those using firewood)? _____

19. Would you consider using other fuels for cooking? Explain why. _____

20. Do you use any other fuels for the purpose of heating (e.g. water) or lighting? Yes/No

If yes please specify which ones _____

21. What does your household use water for? (**Rank** uses from largest to smallest share.)

22. A. How long does it take for you to fetch water (in **minutes**)?

Dry season: _____

Rainy season: _____

What is the main water source? (e.g. directly from river, hand pump, well, spring,)

Dry season: _____

Rainy season: _____

23. How many buckets of water do your household use per day (including for domestic and agriculture use)? **Note the size** of bucket/container/gallon; e.g. 36 cm bucket or 5/10/18 litres.

Dry season. Number of buckets: _____ Size of bucket: _____

Rainy season. Number of buckets: _____ Size of bucket: _____

24. Along the way to fetch water, are there any barriers (include physical and social/cultural and both rainy and dry season)?

Barrier	Dry Season	Wet Season	Reasons

25. Do you experience any problems with water quality? **Yes / No**

If **YES**, what are these problems? _____

26. Is there competition for the water you use? **Yes / No**

If YES; between which groups/for what uses (e.g.competition between farming, livestock keeping, household use)?

27. A) Do you water your farm or garden in the dry season?

Farm: **Yes / No**

Garden: **Yes / No**

B) If **YES** (to either farm, garden or both): which irrigation system do you use?

Farm: _____

Garden: _____

C) What crops do you irrigate?

Farm _____

Garden: _____

D) Do you pay anything to irrigate your farm? (e.g. for the water, labour, infrastructure or power) **Yes / No**

If **YES;** explain how much you pay and for what: _____

28. If you had more water available on your farm, what would you grow? Explain which crops and why: _____

29. A) Have you ever grown sugarcane? **Yes / No**

Explain the answer: _____

If YES,

Did/does this affect your other crops? Yes / No

Explain how: _____

Did/do you sell it or was/is it only for household use? Sell / Household

Did/do you burn the sugarcane before cutting it? Yes / No

30. Would you be willing to grow sugar cane in the future as a commercial product, to be sold? Yes / No

Explain; _____

31. A) Have you participated in the Farmer Field Life School programme that is run by Addax? Yes/No

If YES, ask the following questions:

B) Based on the Farmer Field School (FFLS) programme was the content relevant to your situation?

32) A) What skills and knowledge have you learned from the FFLS programme?

Which ones of the above have you been able to apply?

B) Have these skills brought any changes in your life? Please explain your answer

33) Are you using the FDS services? If Yes, which ones _____

34) Are you a member of any local farmer organizations? Please mention

:::END OF QUESTIONS:::

Notes: Please note if the household has a new house _____

ANNEX 3: FIELD RESEARCHERS TRAINING MANUAL

Training Manual on Selected PRA Methods to be used in Data Collection on the Sustainability Assessment of Makeni Agro Energy Industry Project

Updated: 21 March 2014

Introduction

This document is prepared for the purpose of aiding the process of data collection in the sustainability assessment of the agro energy industry in Makeni Sierra Leone carried out by SEI and a team of research assistants from Makeni. It is meant to collect data on livelihoods aspects, energy and GHG balances, energy and water use and access. The context of this document may be changed according to the context of a village where the tools are used, however, the concept of using a specific PRA tool and the PRA good practice principles should always be taken into consideration. From the Methodology document the PRA tools that will be used include focus group discussions for a homogeneous groups of supposedly community groups that presently supply farm inputs in the targeted areas and or the neighbourhood. The four PRA tools will be applied to community members that are involved in the FDP and the non FDP group, the tools used will be: transect walk with resource mapping, Venn diagrams, seasonal calendars, and impact diagram.

1. Transect walk with resource mapping

Objective: To get a map of the physical structure of the village and understand the perceptions of resources and how people relate to these resources including common property resources, control and access over resources such as water, land and biomass; spatial positions of resources and people. For the case of this study it is important to also capture areas that have become of interest to many groups, perhaps the areas of conflict and how people have been managing them.

Community group involved: A group of men and women involved in the FDP program and those that are not, with diversity of livelihood strategies and incomes.

Materials required: Depending on literacy levels and what works in Makeni flip charts, pencils, rubber and marker pens for drawing the map, otherwise coloured chalks to use on the ground and seeds (maize and or beans), camera and note books.

Facilitation and questions to initiate the discussion

Step 1: Convene in the place prepared for PRA sessions, introduce yourselves, the research project and thank the participants for their attendance.

Step 2: Explain the aim of the exercise: to understand the spatial dimensions of the things they consider important resources in their community including manmade and natural resources, present land use, and how they manage these resources (ownership regimes and access).

Step 3: Write the names of the participants and their positions in the community/their occupation if they allow, and note the contributions from the different groups

Step 4: Note the resources and areas they will be pointing out as important and how they relate to such resources.

Step 5: Convene in the room set for PRA sessions or available space on the ground to plot the map. As the plotting is done the facilitator asks questions on what they

Sample questions:

- What do they think are the most important resources, and why? Who has access to them, and why?
- Can they tell of the condition of the resources – e.g. water quality and amount? Degradation?
- How do they manage them? e.g. is it open for anyone to use, are there any rules and regulations on use?
- Is the resource natural or manmade?
- Farm and pasture lands
- Activities around the resources

All the time the note-taker notes what has been discussed and probes for more clarification when there are unclear issues.

Note: The map is plotted by the group of villagers themselves, facilitators guide the process in terms of agreeing on things plotted, key and compass direction. (The note taker should note the status in terms of power-rich; poor; village leader, age, influence of the person taking the leading the process/drawing the map).

Step 6: Thank the participants again for their willingness to participate and share their knowledge.

2. Seasonal calendar

Objective: For the case of this project the seasonal calendar will be used to understand trends in the main activities, cropping system, problems and opportunities in a year. Most vulnerable times of the year, labour demands.

Topic: Seasonal calendar regarding livelihoods and food security.

Community groups involved: The first group will comprise of women of different age groups and the second one, men of different age groups. Each group will have between 7-10 men and women who are farmers and non-farmers.

Materials required: Marker pens, flip charts, note books and pens

Facilitation and questions to initiate the discussion

Step 1: Convene in the place prepared for PRA sessions, introduce yourselves, the research project and thank the participants for their attendance.

Step 2: Explain the aim of the exercise: To understand different livelihood activities, season wise agriculture operations, cost of operation, income from the different crops and activities carried out by the community. The employment potentials and labour relations.

Step 3: Draw a table with 12/18 (Depending on what the community uses) columns and explain that they correspond to the months of the year. The community can decide/agree how they want their calendar and if they have a local calendar they would like to use then the researcher should adopt the local calendar.

Step 4: Ask participants to list different livelihood activities, planting and harvesting seasons, seasons of high labour demands, festivals and holidays, periods of food scarcity. When everything is mentioned on paper, assist them to plot the information on the calendar plot the information on the calendar as its given.

Sample questions:

- What are the busiest months of the year?
- When is most agricultural work carried out?
- When is the time for non-agricultural work?
- Which is the most appropriate season/time for additional livelihood activities, e.g. temporary employment?
- What time constraints do exist and for what season?
- Are there any irregularities in the seasons?

- What are the wet and dry seasons?
- What time of the year do irrigate?
- What do you do in times of food shortages?
- What do you do in times of droughts and floods?
- Are there times of energy shortage, what do you do?

Step 5: When the calendar is completed, ask the group members the following questions and discuss the results with the participants, as the note-taker records the discussion:

How do you earn money at different points of the year?

- What are the agricultural operations carried out during (farm inputs, transport to markets, mechanization and irrigation if any etc) the year and what is the related cost for the crops grown?
- Income from the different crops grown in the area
- What are the new crops grown in the area?
- Which time of the year do you engage on Addax jobs? (for communities in the project area)

Step 6: Thank everyone for their time and participation.

3. Impact of agro energy industries – impact diagram

Objective: To understand the likely opportunities and threats presented by the agro energy industry as perceived by people and how people are positioned to cope and the inter-linkages of the different impacts around the issues of livelihoods, energy and water.

Community groups involved: Two different groups of men and women, if possible the FDP and non-FDP.

Materials required: Masking tape, flip charts, manila cards, marker pens.

Facilitation and questions to initiate the discussion

Step 1: Introduce yourself, the project and thank the participants for their participation.

Step 2: Explain the aim of the exercise: what impacts (both positive and negative) as perceived by the community is the agro energy industry likely to bring to the community.

Step 3: Discuss what positive and negative things are likely to come as a result of the agro energy industry (many will be mentioned but at the end ask the participants to choose two major ones) from the positive and negative categories and write them on cards. Ask the participant to concentrate on these events.

Step 4: Ask participants on each issue what other related impacts may result from the discussed issue, note them on different cards (one impact per card) and at the end read them out to make sure none is forgotten.

Question to initiate the discussion: What direct and indirect impacts may result from the identified issues?¹

Step 5: Lay the impact cards on the ground around the topic card.

Step 6: Ask the participants what linkages and relations the cards have. Ask participants to rearrange the cards and link the cards with lines, showing the linkages. Encourage them to add impacts at any time or make modifications whenever they see necessary.

¹ The result of the an agro energy industry being present in their community or the changes both positive and negative that may come s aresult of an agro energy industry.

Question to initiate discussion: How are the different impacts related?

Step 6: Ask participants to explain the diagram and to clarify any unclear issues.

Step 7: Initiate the discussion on how they are planning to cope with the negative issues and how they will enhance the positive one.

Note: Repeat the exercise for all negative and positive topic impacts. Please note on the impacts if it is something that is already happening or they are foreseeing as a risk.

Step 7: Thank everyone for their time and participation.

4. Focus group discussions with potential contractors

A focus group is a small group of ideally six to eight people led through an open discussion by a skilled moderator. The group needs to be large enough to generate rich discussion but not so large that some participants are left out.

Ideal time to conduct a meaningful discussion is 45–90 minutes; beyond that most groups are not productive. Focus groups are structured around a set of carefully predetermined questions, usually 6–8 more and at most 10 questions.

Objective: To get an in-depth understanding of the issues discussed and fill in any data gaps from the HH survey

Materials: Flip chart, marker pens, masking tape, notebook.

Facilitation and questions to initiate the discussion

How to do it:

- Thank people for coming
- Explain the purpose of the meeting
- Regulate the discussion, avoid dominance by some members
- Make sure everyone participate
- Note taker should be taking notes all the way
- Summarise the discussions and see if the group agrees
- Ask if anyone has any other comments
- Thank people again

Note: Things to do beforehand:

- Prepare the questions and make sure you understand the questions and you are in a position to elaborate them to people you want to discuss with.
- Predetermine your group members/composition of people you want to talk to.

Questions for discussion

- If you had more free time because of easy access to water and energy, what would you use it for?
- What are the challenges and opportunities in accessing water and energy in your community?
- What has changed over the past three years in terms of food availability, accessibility and affordability?
- Has there been any increase or decrease on household income in the past three years?
- Has there been any infrastructural change including social services in the past three years?
- Do you consider agriculture as a sufficient source of income?

SEI - Headquarters

Stockholm

Sweden

Tel: +46 8 30 80 44

Executive Director: Johan L. Kuylenstierna

info@sei-international.org

Visitors and packages:

Linnégatan 87D

115 23 Stockholm, Sweden

Letters:

Box 24218

104 51 Stockholm, Sweden

SEI - Africa

World Agroforestry Centre

United Nations Avenue, Gigiri

P.O. Box 30677

Nairobi 00100

Kenya

Tel: +254 20 722 4886

Centre Director: Stacey Noel

info-Africa@sei-international.org

SEI - Tallinn

Lai str 34

10133 Tallinn

Estonia

Tel: +372 627 6100

Centre Director: Tea Nõmmann

info-Tallinn@sei-international.org

SEI - Asia

15th Floor

Withyakit Building

254 Chulalongkorn University

Chulalongkorn Soi 64

Phyathai Road, Pathumwan

Bangkok 10330

Thailand

Tel: +(66) 2 251 4415

Centre Director: Eric Kemp-Benedict

info-Asia@sei-international.org

SEI - U.S.*Main Office*

11 Curtis Avenue

Somerville, MA 02144

USA

Tel: +1 617 627 3786

Centre Director: Charles Heaps

info-US@sei-international.org

Davis Office

400 F Street

Davis, CA 95616

USA

Tel: +1 530 753 3035

Seattle Office

1402 Third Avenue, Suite 900

Seattle, WA 98101

USA

Tel: +1 206 547 4000

SEI - Oxford

Florence House

29 Grove Street

Summertown

Oxford, OX2 7JT

UK

Tel: +44 1865 42 6316

Centre Director: Ruth Butterfield

info-Oxford@sei-international.org

SEI - York

University of York

Heslington

York, YO10 5DD

UK

Tel: +44 1904 32 2897

Centre Director: Lisa Emberson

info-York@sei-international.org

SEI - Stockholm

Linnégatan 87D, 115 23 Stockholm

*(See HQ, above, for mailing address)***Sweden**

Tel: +46 8 30 80 44

Centre Director: Jakob Granit

info-Stockholm@sei-international.org

Stockholm Environment Institute

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