



WHY IS ZAMBEZIA LAGGING BEHIND?

- SUCCESSES AND FAILURES OF PAST PROJECTS IN AGRICULTURE, NUTRITION, WATER AND SANITATION, AND CHALLENGES AND OPPORTUNITIES AHEAD

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ACRONYMS AND ABBREVIATIONS

AFPACC	Associação de Fomento dos Pequenos Agricultores Comerciais Conectados
CDCS	County Development and Cooperation Strategy
CLYD	Coconut Lethal Yellowing Disease
COPAZA	Cooperaiva dos Agricultores da Alta Zambezia
FAO	Food Agricultural Organization
GDP	Gross Domestic Product
IFAD	International Fund for Agricultural Development
MCC	Millennium Challenge Corporation
PROMER	Promovendo Mercados Rurais
SCF	Small Commercial Farmer
SEMEAR	FTF - S ementes M elhoradas para ma A gricultura R enovada
SHF	Smallholder Farmer
USAID	United States Agency for International Development
USG	United States Government

Executive Summary

As part of a stocktaking exercise in preparation of the Country Development and Cooperation Strategy (CDCS) of USAID for Mozambique, a review of successes/failures of past investments in Zambezia in agriculture, nutrition and water as well as challenges and opportunities were conducted. The team of consultants reviewed existing reports and evaluations, and interviewed key stakeholders including former governors, provincial directors, producers, managers, and investors. The team also visited Gurue where it conducted a focus group discussion with a producers' association. This report summarizes the evidence and discussions held with the stakeholders on subjects ranging from agriculture and nutrition to water and sanitation. The report also summarizes our views on the challenges and opportunities. We conclude by presenting recommendations for a sustainable transformation of agri-food systems, particularly the need for commercial or market driven interventions.

Our recommendations vary with livelihood zones and/or agro-ecological zones. Here is a summary of our recommendations: 1) Link the Fortunes of Small Commercial Farmers to the Fortunes of Their Smallholder Neighbors; 2) Engage Global Agricultural Research Capabilities Focused on Building Sustained Local Adaptability; 3) Creatively Link Nutrition, Hygiene and Food Security to Commercial Interests; 4) Engage Communities and Stakeholders in Multi-Sector Spatial Strategic Plans and Industry Strategic Plans, and 5) Consider Complementary Investments in Neighboring Provincial and Regional Geographies.

1. Introduction and Background: “Further to Fall”

Zambezia was once the wealthiest and most developed province in Mozambique, representing an estimated two thirds of the national GDP at Independence. Yet today it counts among its administrative posts and districts the most impoverished and malnourished in the country despite decades of post-Independence public and private investment and represents less than one third of national GDP. Many possible explanations can be found in the literature and those interviewed for this report offered various hypotheses for the causes of Zambezia's surprising lack of resilience. Yet without fail, we found that the reasons uncovered all apply to some extent to other regions of Mozambique as well. In the end, those we interviewed who have the most extensive and long-standing experience in Zambezia noted that Zambezia suffered more during the war than any other

province, and that the devastation caused by the war left the province more demoralized, with a longer road to recovery ahead.

Therefore, as we search for solutions to alleviate poverty, malnutrition, and suffering in Zambezia, we probably need not look for solutions that are unique or specific to Zambezia. Rather, we need to understand the development challenges that all of Mozambique faces and acknowledge that Zambezia has suffered more than other provinces. Indeed, the greatest development challenge we encountered in Zambezia is one that we see throughout Mozambique, namely the fact that nearly all interventions by donors and government to address the myriad problems facing Mozambicans have been unsustainable. While desired results are often obtained in the short term when projects are underway, they quickly evaporate when projects end. The only exception to this that we found is when projects have a commercial element or leave behind successful commercial entities or commercial initiatives that continue to create lasting economic incentives for actors that solve the problems addressed by the projects. For this reason, our focus throughout this report is on opportunities – be it for nutrition or food security or livelihoods or gender and youth - that are commercially driven. Whether at the micro level of family dynamics or at the meso level of value chains or at the macro level of political economy, our recommendations focus on commercially sustainable strategies.

2. Methodology

Analysis of the findings from literature reviews and stakeholder and key informant interviews in Maputo, Nampula and Zambezia, and site visits in Zambezia, coupled with the knowledge and experience of the consultant team, were used to develop recommendations for interventions, evaluate risks and recommend risk mitigation strategies.

3. General Findings

3.1 Understand Beneficiary Needs from The Beneficiaries' Point of View

As USAID looks to increase the productivity of smallholder agriculture and improve the nutrition and livelihoods of families in Zambezia, it must insist on “user-centered” or “customer-focused” design and implementation of interventions.

Our first recommendation summarized at the end of this report is to support commercially driven private sector agricultural extension based on a model best exemplified by a group of small commercial farmers (SCFs) in Alta Zambezia called *Cooperativa de Agricultores da Alta Zambezia* (COPAZA).¹ Rather than sell a single product like seeds or a single service like threshing, COPAZA members provide their smallholder farmer neighbors with a full range of services and inputs from mechanical land preparation to seeds multiplied by the SCFs to inoculant for soy production. Furthermore, a decision to include tractor service for land preparation as their core business was based on extensive market research which indicated clearly that tractor service was the product or service that smallholder farmers – even the poorest - most wanted and were most willing to pay for. Donors have typically gravitated toward improved seeds as the critical input to increase productivity, yet we found that projects based only on seed sales – such as SEMEAR – have been relatively disappointing and commercially unsustainable. COPAZA members however by focusing on what farmers most want – tractor services - have been successful not only at selling tractor services profitably but also successful at selling seed and other inputs along with that service.

3.2 The Importance of Long-Term Funding and Planning

PROMER (Promovendo Mercados Rurais) is one of the longest-standing rural development projects in Mozambique and one of the successes that we encountered in our review of projects in Zambezia, most notably the project's success in building dozens of privately owned warehouses in the Alta Zambezia Plateau that support consistent purchasing of commodities – particularly grain – grown on the plateau. According to PROMER's director, the most important element in the success of PROMER has been that despite moving several times between ministries and having to adapt to changing government, donor and agricultural policies

¹ Pereira, Luis (2013). "Soy Value Chain in Mozambique – Results and Challenges." Feed the Future Scaling Agricultural Technology/GLEE. 3-5 Dec 2013, Addis Ababa. <http://agrilinks.org/events/feed-future-scaling-agricultural-technologies-gee-africa>

TechnoServe (2019). "Final Impact Evaluation of the Seed Multiplication Project to Empower Small Commercial Farmers: Dutch Phase II."

https://drive.google.com/drive/folders/1GpmvDjf4oEdqihPjCxCN_dzr03VoVX88Y?usp=sharing_eil&ts=5f3a1f27
TechnoServe. "IPWEU Video Series." <https://www.youtube.com/watch?v=j0FKsdCK-uU&list=PLIJI6Q-rPFQHECa06kZhAUpFhSXivxfah>

over the years, the project has kept to its long-term plan, due in large part to its continued funding over several decades from IFAD (International Fund for Agricultural Development).

Like IFAD, one of USAID's great advantages is that it is often able to program funds over a relatively long period of time, going through as many as three or four funding cycles with the same plan in place and the same implementers – albeit with adjustments in strategies and implementers when merited. In our final section in this report on funding mechanisms, we will suggest how best to capitalize on this opportunity to program over relatively long periods.

3.3 Reinvest in What Works

While investing consistently and coherently over relatively long periods of time is important, it is of course also critical that the investments be achieving their intended results. We found that often the best results were where there is a commitment to project evaluation and to using the results of project evaluation to reinvest in expanding and further learning from successful projects or approaches. The FAO Farmer Field School approach, the FAO input voucher program (an “intelligent subsidy” approach as opposed to “free kits”) and promising early work in PROMER encouraging smallholder family members to regularly plan their household's livelihood strategies together are examples. In our opinion, these three approaches could be integrated into the successful COPAZA commercially based extension model quite effectively. SCFs could be taught to lead Farmer Field Schools, they could utilize vouchers relatively easily among their customers to good effect, and the annual review that SCFs have with their customers could be meetings with the entire family to discuss their livelihood and farming strategies collectively with their SCF advisor at the end of every crop season as they plan for the coming season.

The team that developed the successful SCF model in Zambezia, together with several members of COPAZA and with women involved in baking and selling soybean products and operating soy threshers, has recently launched a new local NGO called *Associação para o Fomento do Pequeno Agricultor Comercial Conectado* (AFPACC). One of our interviews was with the President of AFPACC, and one of the clear objectives of AFPACC that he described is to continue improving the model and contributing to “best practice” learning from its own experience, but also borrowing from other successful approaches. Based on our conversation, we believe that USAID should consider bringing together the FAO and PROMER (IFAD-funded)

teams with the AFPACC and COPAZA (EKN-funded) groups to discuss how some of their successful approaches in Zambezia could be integrated to achieve even better results in future programs.

4. Findings on Agriculture

4.1 Why Maize, Soybeans and Poultry on the Alta Zambezia Plateau?

In the USAID target districts with more rainfall, higher altitudes and more flat land for farming (Gurue, Alto Molocue, Molumbo and Milange, which can be called broadly the Alta Zambezia Plateau) that are suitable for maize and soybeans, we suggest that local small commercial farmers (SCFs) cultivating at least 3 hectares be selected for training and financing to be full-service input suppliers selling goods and services to neighboring smallholder farmers (SHFs). These goods and services should include: 1) tractor and mechanical thresher services for land preparation, planting and harvest, 2) high quality locally tested seed varieties multiplied by the SCFs, 3) additional inputs such as inoculant, fertilizers and application of lime, and 4) training and coaching of SHFs on modern farming techniques – such as early planting and no-till mechanical land preparation - and on the development and implementation of annual farming strategies and business plans.

Maize sales are already the largest source of cash income for smallholders in Mozambique, and though soy income to smallholders is presently much smaller, it has been increasing at approximately 50% per year and appears to be set to continue to grow.

We estimate that the poultry industry has grown from less than 1% to more than 4% of GDP over the past thirteen years. Prior to the hidden debt “crisis,” consumption was growing at 20% per year due to increased urban purchasing power. Once the urban economy rebounds, it is expected that consumption will return to its previous growth rate of 20% per year and poultry will represent an increasingly large proportion of the economy.

Approximately 90% of the frozen chicken consumed in Mozambique is produced in Mozambique, with approximately 10% imported from Brazil. The tariff on imported chicken is 20%; not particularly high by global standards. The expectation is that domestically produced chicken and eggs will continue to be competitive, even with an overly strong Metical; with perhaps a moderate increase in the tariff rate if needed.

70% of the cost of producing a chicken is feed, with roughly half of that being the value of maize and half being the value of soy in the feed. The poultry industry is therefore highly inclusive to the extent that the maize and soy for poultry feed are procured from smallholder farmers in rural Mozambique, which they generally are.

Novos Horizontes, the largest poultry producer in the north of the country, based in Nampula, is planning to invest in additional feed mills, hatcheries, and abattoirs around the country and perhaps not surprisingly the Alta Zambezia Plateau is one of its favored locations for that investment due to the existing and increasing availability of soy and maize.

Novos Horizontes is also keen to expand sales of its “dual purpose” meat and egg chicken breed into rural areas providing a promising opportunity for USAID to collaborate to drive improved livelihoods, increase nutritious egg and meat consumption, and increase purchases of feed grains grown by smallholders.

4.2 Why Mango and Pigeon Peas in the Zambezia Foothills?

In the USAID target districts with lower rainfall, at lower altitude and with less flat land for farming (Ile, Namarroi and Gile, which can be called broadly the Alta Zambezia Foothills) therefore less suitable for soybeans yet ideal for growing mangos and pigeon peas, we will propose that local small commercial farmers (SCFs) with more than average size mango and/or cashew orchards be selected for training and financing to be full-service input suppliers selling goods and services to neighboring smallholder farmers (SHFs). These goods and services should include: 1) cashew and mango seedlings, 2) chemicals for pest control and induction of early flowering, 3) chemical application services, 4) chemical spraying equipment, 5) Effective Microorganisms, 6) additional inputs such as fertilizers and application of lime, 7) small scale irrigation equipment, 8) construction of water harvesting structures, and 9) training and coaching of SHFs on modern farming techniques and on the development and implementation of annual farming strategies and business plans.

Mango is the most grown and eaten fruit in the world, due largely to production and consumption in India. It is grown in India and Africa almost exclusively by smallholders (except in South Africa) and suits smallholder growers exceptionally well. It is a drought-resistant species with a deep tap root, ideal for semi-arid climates like India and Mozambique, and is

resilient to climate variation. Mozambique's mango seasons are the opposite of India's seasons, as the two countries are on the opposite sides of the Equator.

What Mozambique has lacked to turn mango into a successful commercial activity are, above all, access to markets and a variety that is attractive to those markets. The "Rodo" variety, grown by virtually all families along the coast and in the central plateau of Cabo Delgado, as well as Moma in Nampula and Pebane in Zambezia, meets the market attractiveness requirement. It is already the preferred variety in urban markets of the north - namely Nampula, Nacala and Pemba - and it has the ideal size, color, shape, taste, low fiber, shelf life, and transportability for Middle East and South Asian markets. Furthermore, it retains purity of line due to *apomixis*, whereby its seeds do not cross with other varieties.

Counter-seasonal fruit supply to the Middle East, Europe and eventually South Asia would be quite profitable. While the ratio of consumption is generally 4:1 in volume in-season vs out-of-season; prices paid by consumers for counter-seasonal fruit are at least twice as high as in-season prices.

There are three technology investment options for smallholder mango growers in Mozambique: 1) simple irrigation systems to extend late harvest fruit quality; 2) spraying for early flowering for up to 8-months of fruit harvest vs 3-months of harvest; 3) grafting or seedlings for second-year or fifth-year first harvest respectively. A network of SCF nurseries – similar to nurseries that already exist in Cabo Delgado - should be promoted by USAID in Alta Zambezia to provide these inputs.

In addition to substantially enhancing family incomes, the availability of mangos over 8 months of the year instead of 3 months, would likely improve family nutrition significantly, as 87% of the minimum daily requirement for Vitamin A is provided by one mango, one of the highest Vitamin A levels among fruits.

The enhanced availability of water for the irrigation of mangos, together with intensive composting would likely simultaneously unlock other horticultural value chain opportunities.

Pigeon peas also have untapped nutritional benefits at the family level and beyond, pigeon peas are highly drought tolerant, and despite the quota regime for exports to India there are market growth opportunities both domestically and internationally. Zambezia already grows

more pigeon peas than any other province, especially in these hilly central districts of the province, but yields could be improved considerably with improved inputs and farming practices.

4.3 Why Coconuts and Bananas in Coastal Zambezia?

Despite a relatively large investment by the USG's Millennium Challenge Corporation to replant coconut trees in Zambezia following an outbreak of Coconut Lethal Yellow Disease (CLYD) the economic (and nutritional) impact of the blight continues to be massive for the coastal districts of Zambezia and its people. MCC's strategy to partner with Madal - the largest coconut growing and processing company in the country - to deal with the disease did not result in the recuperation of the industry or the coconut groves. In fact, despite benefiting from the MCC program, both Madal and Boror, the other major industry player, were essentially bankrupted by the disease and are in the process of shedding land and assets and becoming a former shadow of themselves, if they survive at all.

Our view is that coconut replanting could have been successful with a more smallholder-focused strategy of training farm families to select the right trees for removal, compensating the farmers for doing so, teaching them to select coconuts from the right trees to be raised into seedlings, and compensating the farmers for planting the seedlings successfully.

In addition to the replanting coconut trees by smallholders, which take eight years to reach maturity and start producing, the coastal districts of Zambezia have excellent potential to grow export-quality bananas which would begin to produce only nine months after planting, creating tens of thousands of jobs at banana plantations for smallholder families. (Unlike mangos, large plantations are more suitable than smallholder farms for producing export quality bananas.) Growing and exporting bananas can be achieved in Zambezia without major investments in secondary roads because numerous waterways and inlets along the coast of Zambezia can be used for barge transport, similarly to the banana growing areas of Colombia. Madal alone has approximately 30,000 hectares of land that it is seeking to sell that is suitable for growing bananas along the coast, which would create approximately 40,000 jobs in what is presently the most fragile region of the province. USAID and other donors need to work with Madal and Boror and the government to attract investors to grow and export bananas to quickly generate large scale employment for the vulnerable populations of coastal Zambezia.

5. Findings on Forest Products: Why Reforestation in Alta Zambezia?

Perhaps the largest opportunity for Mozambique to balance the scale of its point-source extractive industries is the pulp, paper, and wood industry, based on plantations of fast-growing tree species. A study conducted by the FAO several years ago, estimated that Mozambique has the potential to plant between 3 million and 7 million hectares of fast-growing trees for paper, pulp and wood. By comparison, South Africa's relatively large forest product industry plants only 1.5 million hectares.

Ile and Namarroi are already districts where Portucel, a major global player in the paper and pulp industry, has chosen to make a substantial investment in eucalyptus plantations; and all seven USAID target districts are highly suitable for reforestation. Planting 3 to 7 million hectares of trees would create between 300,000 and 700,000 jobs in Mozambique with up to half of them potentially being in Alta Zambezia.

6. Findings on Nutrition and Water

6.1 Commercial Sustainability May Be Key

Making agricultural extension pay for itself as AFPACC and COPAZA have done, is challenging enough but creating commercially driven nutrition and hygiene education is undoubtedly even more challenging. We believe there need to be more innovative strategies for integrating nutrition education, including water and hygiene, into agribusiness: examples include 1) bartering broken, oiled and fortified processed pigeon peas for whole pigeon peas; 2) creating inexpensive meat substitutes with corn-soy blend to be marketed under existing poultry or other brands; 3) induction of the flowering of a desirable variety of mango to extend mango availability from three to eight months both for sale and for family consumption; and 4) development of nutrition education (including WASH) and national nutrition-themed advertising programs with the companies that sell the above.

We will come back to these ideas in our recommendations at the end of this report; however, suffice it to say for now that making improved nutrition and nutrition and hygiene education commercially relevant is one of the keys to sustainable improvements in nutrition and hygiene and that it can be part of USAID's strategy going forward.

6.2 Suffering in the Coastal Districts is the Most Acute

Water quality and availability are highest in the western plateau districts of Gurue, Alto Molocue, Molumbo and Milange, followed by the central foothill districts of Gile, Ile, Namarroi and Lugela.

Though geologic constraints to community wells are high in the central foothill districts, we believe that opportunities may exist to develop family-level water storage for both domestic use and for limited irrigation to improve the quality of mangos. Small quantities of irrigation in the early stages of mango growth reduce the risks of internal rotting of mangos that can be caused by heavy rains following periods with almost no rain. Water storage would also enable farmers to grow horticultural crops in general for both home consumption and sales, which could improve family diets, income, as well as water availability for personal hygiene and health.

The coastal districts are where investment in improved access to water is most needed and where the impact on health and nutrition of poor water quality is the most worrying according to the officials responsible for public works, nutrition, and food security that we spoke with.

Unlike the urban areas in the southern provinces, there is no known water providers in Zambezia urban areas (Quelimane, Mocuba and Gurue). A Rapid Water and Sanitation Market Assessment conducted by SPEED+ in 2018, found that Mozambique has made limited progress in water and sanitation. Access to water and sanitation in Zambezia continues to be an illusion. Local authorities both from the public works and health indicated technical and financial challenges to meet the basic needs in water and sanitation in Zambezia.

7. Findings on Gender and Youth

7.1 Employment is Empowering, with the *Machamba* as “Safety Net”

Nothing concerns youth more than their perception of limited opportunities and nothing liberates women more than employment off the farm. It is therefore essential to develop dynamic value chains that employ increasingly large numbers of youth and women. USAID and USDA have already played the leading role in nurturing or reinvigorating value chains from cashew processing to sesame to poultry to soybeans to bananas to reforestation, creating tens of

thousands of jobs. These successes need to be reinforced and complemented with continued engagement of communities and local governments to identify opportunities, design and implement strategies to seize the opportunities, and promote both public and private investment in value chains that create jobs for youth and women.

A word of caution however: as we surveyed Alta Zambezia districts, we were surprised to find that some of the worst pockets of poverty and malnourishment are areas that had produced tea during colonial times and had attracted people from other districts to work on the plantations. When the market for Zambezia tea in mercantilist Portugal ceased to exist after Independence, many of the tea plantation workers became unemployed. In most cases, they stayed where they were despite being relatively marginal areas even for subsistence agriculture. While a more in-depth study of these people would be needed to understand why they stayed, our hypothesis is that they had transitioned away from farming to “modernity” (somewhat like coal mining families in Appalachia) and expected or continued to hope that their jobs would eventually reappear.

Regardless of the reason that they stayed put, we believe there is an important lesson to be learned about selecting new industries that are likely to remain over the long term and about promoting and encouraging workers in new industries to maintain and improve their smallholding farms as a “safety net” should these new industries fail or relocate.

In our recommendations at the end of this report, we will suggest that USAID promote the development of several value chains in Zambezia with the potential for dynamic growth, but that are also unlikely to up and leave: namely maize and soybeans, poultry, and reforestation in the western highlands; pigeon peas and mangos in the central highlands; and bananas along the coast.

Maize is Mozambique’s #1 food crop and estimates are that demand will continue to see substantial growth – from growing cities and from continued increases in poultry consumption. Soybean demand will also grow due to continued increasing demand for eggs and chicken meat. Furthermore, we believe there is a significant opportunity for products made by blending maize and soy – from corn-soy blend for the World Food Programme (WFP) to inexpensive meat substitutes for the general population.

Global demand for paper and wood products as environment-friendly alternatives to plastic products and packaging is expected to be quite robust. Also, once companies make major investments in reforestation, they are unlikely to pack up and leave should labor rates or exchange rates become less favorable. Mozambique's comparative advantage in reforestation is related to climate and soils but is also related to features of the land law and to the relative availability of land, especially along its western and northern borders. These advantages are unlikely to change.

Pigeon peas and mangos are both highly nutritious drought resistant smallholder-suitable crops that grow well on a variety of soils and on both flat and hilly land, creating an ideal foundation of food security for Mozambique. While bananas for commercial export are more suited to larger holdings of irrigated land than to smallholdings, global demand is exceptionally stable and among the most resistant to economic downturn.

Reforestation and bananas together can create nearly a million jobs in Mozambique, with probably more in Zambezia than any other province. However, by also promoting the creation of SCF networks to provide agricultural goods and services to smallholders, USAID can further ensure that the families of reforestation and banana industry workers will be able to continue farming, expand their farms, and increase their productivity, protecting them from the possibility – though relatively unlikely – of family members losing their jobs at banana or tree plantations at some point in the future.

These labor-intensive industries (bananas and reforestation) are characterized by high stability or “staying power.” Nonetheless, a profitable and productive *machamba* at home provides additional food and livelihood security. We recommend that USAID invest in helping build dynamic value chains like poultry, feed grains, reforestation and bananas that create demand for smallholder crops and/or hundreds of thousands of jobs – which are critical for empowering women and engaging youth. Yet at the same time we recommend that USAID invest in building SCF networks to support technologically advanced modern small family farms that further enhance food and livelihood security.

7.2 Harvest and Post-Harvest Business Opportunities for Women, Linked with Nutrition

Several projects focused on women in Alta Zambezia have been successful and are worth expanding. CLUSA has created a network of women - now organized into an association called NOSSARA - that increasingly processes and sells soy milk and baked soy products in the communities that grow soybeans. TechnoServe has successfully promoted the provision of mechanical threshing of soybeans and pigeon peas in the same region as a service owned and operated by local women. As soybean production continues to expand, these harvest and post-harvest business opportunities for women will continue to grow. Trading in soybeans and pigeon peas might also make sense as business line for these entrepreneurial women since they are already involved in harvest and post-harvest aspects of the value chain, linking these women-owned businesses to companies procuring soybeans and pigeon peas. These women could also become agents to market meat substitutes made with soy and soy oil - and even processed pigeon peas - to their soy milk and baked good customers, all promoted with messaging on nutrition and hygiene.

8. Findings on Decentralization

8.1 Commercial Farming, Constraints and Critical Gaps

Along the lines of our observations in the above section, Born and Hamela in their SPEED+ report on the “Evolution of Commercial and Smallholder Agriculture in Mozambique,” note that donor success in improving productivity, nutrition, food security and livelihoods requires significant concurrent private investment in targeted value chains. These private investments drive 1) market demand for smallholder crops, as in the proven case of poultry industry growth leading to demand for soybeans, and/or 2) substantial employment of members of smallholder families so that wage income is available to invest in family farm inputs, as in the proven case of reforestation and banana industry growth leading to increases in input usage and productivity among surrounding smallholder families.

Born and Hamela also argue that removing the multitudinous constraints to the success of relatively large-scale commercial agriculture could be transformative for the development of Mozambique generally. They identify the lack of free-hold land titling and the relative acidity of

soils as two of the most important critical constraints. In our view, the identification of constraints is well and good, however we would argue that the identification of sources of political power that can successfully advocate for the sustained mitigation or removal of these constraints is even more important.

8.2 Empowerment by Strengthening Commercial Extension Networks and Growing Industries

We will recommend several core strategies below for USAID in Alta Zambezia – 1) strengthening commercially-based agricultural extension networks, and 2) strengthening promising industries like reforestation, banana, food and feed grains and poultry. Implementing these strategies will not only improve livelihoods, agricultural productivity, nutrition and environmental sustainability but will also increase the political power of farmers – small, medium and large – and related agribusinesses, creating capacity and political power to advocate successfully for a range of policies like those identified and described by Born and Hamela that can further transform the rural landscape for the better.

Strong networks of SCFs and their SHF customers can be successful advocates for agricultural policy. Already the COPAZA network of 30 SCFs and their several thousand SHF customers from Alta Zambezia were successful in advocating against a proposed export tariff on pigeon peas. COPAZA president Armando Catxava traveled to Maputo and spoke at several events on behalf of smallholder customers of COPAZA members who grow pigeon peas, noting that while he himself and most COPAZA members did not grow pigeon peas, many of their customers did and that the proposed export tax would reduce smallholder income and hence reduce their ability to buy goods and services from COPAZA members. The proposed export tax was defeated.

Strong industries can be even more powerful, especially when led by powerful women. The poultry industry's impressive turnaround from producing 10% of domestic consumption of frozen birds to producing 90% of domestic consumption, growing from 1% of GDP to over 4% of GDP over five years, was partially the result of three powerful women who led the industry in opposition to one of the country's most powerful businessmen, the #1 importer of Brazilian frozen chickens, widely considered to be the largest financial supporter of the Frelimo party at that time. The country's chief veterinarian, the president of the national poultry association, and

the president of the association of women poultry growers of Maputo – all three women - were instrumental in mobilizing public support for the government to sanction the #1 importer and stem a tide of illegal imports that were flooding the market and threatening to destroy the domestic poultry industry.

We believe that pursuing a two-pronged core strategy of strengthening commercially driven networks of SCFs and SHFs and of strengthening domestic industries like reforestation, poultry, food and feed grains, bananas, mangos, and pigeon peas that are inherently inclusive - ideally with women in leadership positions - is the best strategy to build the political power needed to advocate successfully for favorable agricultural policies over the medium to long term.

9. Findings on Potential for Violent Extremism: Isolation and Suffering in Coastal Districts Needs to Be Addressed

The coastal area of Zambezia is underserved with basic infrastructure (roads, power, water supply) which feed perceptions amongst marginalized populations that they are being victimized by the State. These perceptions can lead to easy recruitment of young people to join extremist groups such as the one operating in the northern region of Cabo Delgado.

Given the relative isolation of coastal districts - especially Pebane and Maganja da Costa - highlighted in our conversations with several members of the provincial government, we believe there is significant potential for violent extremism to take hold in these districts. For that reason, combined with its synergy with opportunities in Gile, Ile and Namarroi, expanding USAID's investment into these districts would make sense.

The coastal region has significant potential to become a hub of commercial banana production for exports, creating tens of thousands of jobs for local populations, but also creating a cold chain logistics platform for the export of mangos to the Middle East, Europe and eventually South Asia from the central highland areas of Gile, Ile and Namarroi. Supporting the development of tropical fruit value chains – namely bananas and mangos – along with the replanting of coconut trees by smallholders, should be priorities for USG and USAID to help mitigate the threat of violent extremism in Zambezia.

10. Recommendations

1st Recommendation: Link the Fortunes of Small Commercial Farmers to the Fortunes of Their Smallholder Neighbors

We propose that USAID promote the SCF microentrepreneur-driven extension model to sustainably provide a full package of input and offtake options to smallholders in Alta Zambezia. This model is described in the USAID LEO Report #7 “Scaling Impact: Extending Input Delivery to Smallholder Farmers at Scale”² and it was introduced, tested, and modified over the past 10 years in Gurue and Alto Molocue, where 30 small commercial farmers were selected, trained, financed and organized into what is today COPAZA, the *Cooperativa de Productores da Alta Zambezia*.

Over that period, COPAZA’s 30 members have evolved from farming an average of 5 hectares each to farming over 15 hectares each; they have learned and applied modern farming techniques, including use of improved seed and inoculants, early planting, and mechanical land preparation, planting and threshing; many have introduced irrigation; they have become increasingly sophisticated in how they market their crops, continuously obtaining price and market information and accessing multiple buyers; and they plant “demo plots” annually to demonstrate to others the impact of improved practices. The demo plots then become a tool to assist the COPAZA members in selling inputs and mechanization services to thousands of neighboring smallholders, along with providing knowledge and advice to the smallholders on how to select farming strategies and use the inputs and services to implement their chosen strategies.

As the businesses of COPAZA members have grown and become increasingly complex, the COPAZA members themselves have recognized the increasing need for training in higher level business skills – such as financial management, cash flow and inventory management, selling techniques and sales management. USAID’s intervention should include training in business skills for new SCFs in Molumbo, Milange, Gurue and Alto Molocue - including

² Scaling Impact: Extending Input Delivery to Smallholder Farmers at Scale, LEO Report #7; https://marketshareassociates.com/wp-content/uploads/2015/07/Scaling_Impact_-_FINAL_508_Compliant_updated.pdf

“farmer to farmer” training by COPAZA members - but also continued upgrading of the business skills and tools of COPAZA members as well.

While past Food-for-Peace projects in Mozambique have focused on NGO extension networks, experience shows that if USAID wants to ensure sustainability of its investment in smallholder productivity, yet also wants to reach the poorest-of-the-poor and most vulnerable, especially women-led households, it should channel future Food-for-Peace funding into building commercially sustainable networks of micro-entrepreneurs – like the successful COPAZA example in Alta Zambezia or like similar networks described in the LEO #7 Report.

A note of caution, though: the government’s SUSTENTA project was designed based on the COPAZA model and appears not to be working as intended. We have been unable to obtain any independent evaluations of SUSTENTA, however from our interviews with people involved in the SUSTENTA project it appears that SUSTENTA beneficiaries were chosen based on political affiliation and political position, not on farming skills or experience as in the COPAZA initiative. Also, the equipment loans under SUSTENTA are provided by the government, not by commercial banks as they were in the COPAZA project. In our views, these critical differences/deficiencies largely explain why most reports on SUSTENTA, although unfortunately still anecdotal, are indicating much less impact and less sustainability than the COPAZA project or the microentrepreneur projects described in the LEO #7 Report footnoted above.

2nd Recommendation: Engage Global Agricultural Research Capabilities Focused on Building Sustained Local Adaptability

Past USAID interventions in Zambezia have included partnerships with global agricultural research institutions. We recommend that USAID continue to invest in relevant agricultural research partnerships. However, in our field interviews it became clear that the pace of change in climate, markets, technologies, policies and government and donor priorities and available financial resources is quickening rapidly. For that reason, SCFs and smallholders will increasingly need to be able to find their own solutions to emerging problems, hence the focus of intervention by international research agencies should be on building sustained local adaptability rather than on their traditional emphasis on finding and diffusing problem solutions themselves.

In our section above on reinvesting in what works we recommended that USAID encourage COPAZA, AFPACC, FAO and PROMER to join forces to integrate Farmer Field Schools, SCF Networks and Family Meetings into a portfolio of strategies to promote resilience and sustained adaptability. We recommend that the international research institutions that USAID chooses to engage under its emerging program strategy be required to focus on further support to this collaboration to build local problem-solving capabilities.

3rd Recommendation: Creatively Link Nutrition, Hygiene and Food Security to Commercial Interests

Pigeon peas represent an exciting opportunity for improved nutrition throughout Mozambique and among poor families in Alta Zambezia that produce pigeon peas. High in iron, protein, energy and fiber, processed pigeon pea is a staple food of South Asia – known as *toor dal*. The primary reason that pigeon pea is not more widely eaten by urban consumers in Mozambique is its relative unfamiliarity as a foodstuff; the primary reason that it is not eaten more by smallholder pigeon producers is that home processing of dried peas is extremely laborious. Generally, dried pigeon peas are kept in storage by smallholders in Mozambique as “starvation” food, only to be processed and eaten when all other food sources have been depleted.

Mozambique’s Export Trading Group (ETG) has pigeon pea processing factories in Gurue, Beira and Nacala that are presently operating under capacity. In our interview with ETG principal Guillermo Machado, we discussed two collaboration strategies to promote more domestic consumption of processed pigeon peas: 1) bartering broken, oiled (with fortified oil) processed pigeon peas for whole unprocessed pigeon peas with smallholder producers and 2) development of nutrition education (including WASH) and national nutrition-promoting advertising programs to sell more *toor dal* domestically. Based on our conversation, we believe that USAID should continue this discussion with ETG to further a partnership around promoting processed pigeon pea consumption.

A second promising opportunity for improved nutrition in Mozambique in collaboration with the private sector is the development of corn-soy blend (CSB) products for WFP and for manufacturing inexpensive meat substitutes for domestic markets. Poultry meat companies like Novos Horizontes would likely be ideal partners given that they are already extruding soybeans

and milling maize for poultry feed production, and that they already have a well-known poultry meat brand that could be extended to meat substitute products. Again, we recommend that USAID engage Novos Horizontes about possibly investing in CSB and meat substitute production in Alta Zambezia and developing nutritional messaging as part of a national advertising program for these products. Alif Quimica, a large vegetable oil refinery in Quelimane, also confirmed an interest in expanding into the production of meat substitutes and an interest in collaborating with USAID on nutritional messaging to market their products.

The third promising avenue to promote improved nutrition synergistically with agriculture is widespread planting of the highly desirable Rodo mango variety. Farmers need to be trained in the induction of early flowering to extend the mango harvest from three months to eight months of the year. increasing family income and increasing the period of vitamin A consumption from mangos to eight months of the year. Rodo mango, which is already grown in nearby and sold at premium prices in the urban markets of the north, would be particularly suitable to smallholders in the hillier districts of Alta Zambezia, namely Gile, Ile and Namarroi, that are less suitable for soy, maize and poultry than are Alto Molocue, Gurue, Molumbo and Milange.

4th Recommendation: Engage Communities and Stakeholders in Multi-Sector Spatial Strategic Plans and Industry Strategic Plans

We recommend that USAID engage communities and stakeholders in the seven targeted districts – Alto Molocue, Gurue, Molumbo, Milange, Namarroi, Ile and Gile – in a process of district-level multisector strategic spatial development planning using the most up-to-date satellite imagery, led by ADVZ. Based on our experience in the Lichinga Plateau,³ this process will unlock significant economic growth potential and job creation – especially from opportunities for reforestation – while simultaneously reducing environmental damage from slash-and-burn agriculture, creating new conservation areas and sequestering relatively large quantities of carbon.

³ AFVP_Dobbin International_Workshop #6 Presentation_2013-07-31.pptx. <https://james-dobbin.wetransfer.com/downloads/53a2f58c0ceb4da0dd723eff85697f1a20200813161145/dd6a793f40e99136c55ac62381da784820200813161145/b1cd98>
https://drive.google.com/drive/folders/1GpmvDjf4oEdqihPjCxN_dzr03VoVX88Y?usp=sharing_eil&ts=5f3a1f27
Example of a multi-sector strategic spatial plan, in this case of the Lichinga Plateau.

Spatial plans, programs, strategies, and policies add a deliberate dimension – spatial planning is proactive rather than reactive or regulatory (such as the EIA planning process) - identifying and addressing the development issues and opportunities raised by using a spatial/geographic lens to consider the past, present and different possible futures. Spatial plans relate to a specific geographical area and use advanced geospatial planning tools and techniques (such as high-resolution satellite imagery as one of many data sources) and applying spatial suitability and planning models using Geographic Information System [GIS] to help identify real issues, constraints, opportunities, socio-economic development strategies and alternative scenarios, visions, action plans and investments.

Strategic spatial development planning takes a holistic multi-sector approach, covering entire regions, multiple sectors and development themes (e.g., poverty alleviation, water availability, accessibility) considering past, present and future development scenarios. In fact, spatial planning is now considered the “umbrella” term for all physical planning processes – i.e., strategic spatial planning, regional planning, land-use planning, national and provincial planning, district planning, macro-zoning, and structural plans.

In addition to engaging communities and stakeholders in strategic spatial planning, we recommend the USAID support the development or updating (where they already exist) of Industry Strategic Plans⁴ for reforestation, poultry, maize, soy, pigeon pea, Rodo mango, banana, pineapple, rice, and coconut.

5th Recommendation: Consider Complementary Investments in Neighboring Provincial and Regional Geographies

Finally, we recommend interventions in additional geographies and value chains with inherent synergies to the interventions recommended for the targeted districts in Alta Zambezia.

For example, the Mueda Plateau in Cabo Delgado (Mueda, Montepuez and Balama districts) and the Lichinga Plateau in Niassa (Lichinga, Chimbonila, Sanga and Muembe districts) and Niassa and Nampula districts along the Malawi border south of the Lichinga

⁴ Soybean Innovation Laboratory (2014). “The Essential Linkage.”
<https://www.youtube.com/channel/UCCclyXIWE4OAwDIkCT8jjgQ>
<https://m.youtube.com/watch?v=9KR80mShGPo>

Example of an ISP (poultry industry, in this case) in Mozambique. A 30-minute video, but worth watching.

Plateau (Mechanhelas and Cuamba districts in Niassa, and Malema and Ribaue districts in Nampula) have very much the same agronomic profile as the western districts of Alta Zambezia (Alto Molocue, Gurue, Molumbo and Milange districts.) These geographies are therefore logical fits for the same package of interventions beyond Zambezia by USAID and/or other donors, to fully realize the exceptional potential for soybeans, maize, poultry and reforestation in this region stretching from the Mueda Plateau in Cabo Delgado to the Lichinga Plateau in Niassa to Milange district in central Zambezia.

We further recommend developing the significant opportunity of the coastal districts of Zambezia (from Pebane to Chinde districts) to be the locus of a globally competitive banana industry. This intervention would provide a year-round cold-chain platform through Quelimane or Chinde ports to help drive the mango opportunity that we have identified for Gile, Ile and Namarroi districts. Expanding USAID intervention into these coastal districts would result in greater impact overall in Zambezia, mitigating the risk of violent extremism, but would also help ensure the success of the recommended mango industry interventions in Gile, Ile and Namarroi. It would furthermore serve as a model for the integration of banana and mango opportunities in the coastal districts of Nampula and Cabo Delgado through the ports of Nacala and Pemba.

Summary of Recommended Interventions with Funding Mechanisms

The table below summarizes the interventions we have proposed in the seven districts in Zambezia selected by USAID for specific attention, the additional Zambezia districts we recommend for consideration along the coast, and suggests the most appropriate USG funding sources for these interventions. The districts are divided into three groups based on agro-climatic and topographical differences and hence different crop suitability. Interventions are divided into those targeted at strengthening dynamic value chain growth and those targeting farm level productivity, improved nutrition and food security. Recommended partnerships with government agencies, private sector companies and international research agencies are included in the table.

istricts (Government Partner)	Dynamic Value Chain/Industry Growth/Employment Funded by EG and/or Food-for-Progress			Smallholder Productivity/Nutrition/Food Security Funded by Food-for-Peace		
Alto Molocue Gurue Milange Molumbo	Commodities	Key Activities	Private Partner(s)	Commodities	Key Activities	Research Partner
(ADVZ)	- Reforestation - Poultry - Corn/Soy Blend - Meat Substitute	- ISP Updates - MSSPs - Investment Promotion	- Novos Horizontes - Alif Quimica	- Soy - Maize - Eggs	- SCF Soybean Extension Network - Women's Post-Harvest and Nutrition Business Network - Promote Dual-Purpose Poultry for Smallholders	- IITA - Soybean Innovation Laboratory
Ile Namarroi Gile (ADVZ)	- Reforestation - Pigeon Pea - Rodo Mango	- ISP Updates - MSSP Update - Investment Promotion	- Portucel - ETG	- Rodo Mango - Pigeon Pea - Eggs	- SCF Mango Nursery Extension Network - Tree Planting Incentives - Pigeon Pea Exchange (w/ETG) - Promote Dual-Purpose Poultry for Smallholders	- ICRISAT
Pebane Maganja da Costa Namacurra Nicoadala Quelimane Maquival Inhassunge Chinde (ADVZ)	- Banana - Pineapple - Rice - Coconut - Rodo Mango	- Fruit ISP - Rice ISP - MSSPs - Quelimane and Chinde Ports - Investment Promotion	- Novo Madal - ETG	- Rodo Mango - Pigeon Pea - Coconut - Rice - Eggs	- SCF Mango Nursery Extension Network - Tree Planting Incentives - Pigeon Pea Exchange (w/ETG)	- International Coconut Committee (ICC) - ICRISAT

11. The Risks of Dependency, Rent Seeking, Political Patronage and Control, and an Overly Strong Metical: Can They Be Mitigated?

In this report, we have emphasized that agricultural extension networks and nutritional messaging need to be commercially driven to be sustainable.

Unfortunately, Mozambique has a long history of donors and government distorting markets so significantly to address market failures that they have time and again made both input and output businesses unsustainable. Zambezia is no exception. USAID and Dfid made massive investments in Zambezia in the 90's yet with little to show over the long term from their interventions. Today, the government is touting its Sustenta program in Zambezia and rapidly expanding it nationwide, despite evidence that far from encouraging the development of commercially sustainable agribusinesses, the program distorts markets – by giving away essentially free tractors and free inputs.

This tendency is reinforced by opportunities for rent seeking and political patronage and control that often accompany market distorting projects. Commissions on input or equipment purchases to provide “kits” for smallholders or extensionists, payoffs for industry protection or subsidies on the output side, and so on, are exceedingly common in Mozambique. Lack of transparency or real competition in awarding matching grants or never-to-be-repaid equipment loans are also commonplace.

USAID's policy to largely manage its own projects is a desirable starting point to avoid many of these risks, problems and drawbacks that often plague government-managed projects. However, the fact is that USAID-managed projects must still operate in an environment where the distortion of markets by others is occurring. Projects that seek commercial viability as a goal are unlikely to succeed unless they have a strategy to mitigate these risks of market distortion. Our recommendation to USAID is that the highest levels of the Mission and USG must engage with other donors – especially the World Bank – to attempt at a minimum to “protect” certain geographies from overly market distorting projects. They must also encourage all donors to engage in open and transparent project evaluation to develop “best practice” for all donors and government in the management of projects that are seeking to encourage commercial viability of markets for agricultural inputs and outputs.

Finally, a word about the risk of an overvalued currency. The feverish rush of Mozambique's political leadership to extract everything possible from the ground in the shortest time possible is palpable. The government may not have much of a strategy for anything else, but it definitely has pursued and continues to pursue an all-out drive to make commodities – from aluminum to rubies to graphite to gas, oil and coal – the foundation of the country's economy. Whether or not gas turns out to be the ultimate bonanza that the government envisions, point-source extractives are still likely to play an outsized role in Mozambique's economy and therefore the likelihood is quite high that the country will suffer from an overvaluation of its currency to some extent at least.

We believe that Mozambique's comparative advantages – particularly in tropical fruit and reforestation – are so compelling and substantial that those industries may still be competitive in an economy over-weighted by point-source extractives. Others however, like grains and livestock, will probably need tariff protection in the coming years to survive. In both cases, substantial investments in infrastructure, systems and policies that increase the efficiency of all these industries we have recommended for USAID and USG investment will be helpful in keeping the country competitive despite suffering to a degree from an overvalued currency. We recommend that USAID and SPEED+ or its successor prepare the government for this scenario, recognizing the likely need for some tariff protections and for substantial investments in infrastructure, systems and policies that create efficiencies and global competitiveness. Only then will products “Made in Mozambique by Mozambicans” begin to create truly sustainable wealth for the country and its people.

Appendix A: List of Persons and Organizations Contacted

Name	Title	Organization
Isabel Andrade	Country Representative	International Potato Center
Abdul Razak Noormahomed	Ex – Governor Zambézia	Government of Zambézia
Kátia Dias	Country Representative	GAIN
Adolfo Muholove	CEO	GAPI- SI
Francisco Souto	Senior Advisor	GAPI- SI
Arlito Cuco	Director	Green Resources
Carla Honwana	Director	PROMER
Manuel Araujo	Presidente	Município de Quelimane
Cristiano Paulo Taimo		CLUSA
Flávio Zaqueu	Hub Coordinator - Mocuba	FAO
Cláudia Pereira	Assistant Representative	FAO
José Matsinhe	Program Officer	FAO
Lourdes Fidalgo	Director	Food Security and Nutrition Association (ANSA)
Samora Machel Jr.	Presidente	AFPACC
Carlos Mugoma	Deputy Manager	InovAgro
Steve Boahen	Country Rep	IITA
Carlos Malita	Manager	SEMEAR
Andrew Cunningham	CEO	Novos Horizontes
Fernando Namacua	Director Provincial	Agricultura e Pescas
Fernando Maienge	Director Provincial	Obras Públicas
Merlinda Ramos	Chefe	Planificação -DPSaúde
Nilza Francisco	Gerente	GAPI, SI Zambezia
Isabel Oliveira	Ponto focal	SETSAN

Francisco Furuma	Director de Programas	WVI
Egídeo João	Coordenador Nacional RRD	WVI
João Lameiras	CEO	Novo Madal
Gawie Roets	Chief Operating Officer	Novo Madal
Roberto Mito Albino	Director Geral	Agência de Desenvolvimento do Vale do Zambeze
Francisco Faruk	Director	Alif Química
Armando Catxava	Presidente	COPAZA
Jorge Saraiva	Farmer	COPAZA
João Alberto	Farmer	COPAZA
Raimundo Saraiva	Farmer	COPAZA
Martinho Uiriamo	Farmer	COPAZA
Aleura Ramos	Farmer	COPAZA
Genésio Doglasse	Farmer	COPAZA
Joia Alberto	Farmer	COPAZA

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