Case Study

Establishing Private Sector Capacity for Seed Inspection in Mozambique

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List of Acronyms

APROSE:	Association for Promotion of the Seed Sector
FAO:	Food and Agriculture Organisation
MADER:	Ministry of Agriculture and Rural Development
MASA:	Ministry of Agriculture and Food Security
MOSTA:	Mozambican Seed Trade Association
MSD:	Market Systems Development
NGO	Non governmental organization
OPV:	Open Pollinated Variety
PSSI:	Private Sector Seed Inspector
RSL:	Regional Seed Laboratory
SD:	Seed Department
SDC:	Swiss Agency for Development and Cooperation
SHF:	Smallholder Farmer

FOREWORD AND ACKNOWLEDGEMENTS

Innovations for Agribusiness (InovAgro) is a Swiss Agency for Development and Cooperation (SDC) funded project which uses a market systems development (MSD) approach to improve the incomes for poor women and men small scale farmers in three provinces in Northern Mozambique (Nampula, Zambézia, and Cabo Delgado). The project is implemented by a consortium of DAI Europe and COWI. InovAgro leads initiatives to develop stronger, more inclusive, commercially driven and competitive market systems for agricultural input supply (especially seed sales and crop protection products) to smallholder farmers (SHF); output marketing (the efficient sale by SHF of their production); and access to finance for SHF to purchase inputs and for traders to purchase outputs. InovAgro engages with key market actors to strengthen the supporting institutional and policy/enabling environment to address systemic constraints of smallholder agricultural development.

The project started with a six-month design phase in 2010 and has had three implementation phases between 2011-2020. As the MSD approach was new to Mozambique in 2010, the first phase was to test the assumptions from the design phase and get a proof of concept. The second phase was designed based on the results and learnings from the first phase, to expand the impact. The third phase has been a consolidation phase to continue the growth while testing exit strategies and capturing the lessons learned for sharing more broadly in the development community in Mozambique and internationally.

The Case Study Series.

InovAgro launched its case study series to capture the knowledge it has gained on market systems development in Mozambique since 2011 and to share it widely among the agricultural development stakeholders including the government, market actors, and donor agencies. This case study is the seventh in the series which includes case studies on the Fundo Agricola Savings for Seed, Market Systems Approaches to Land Titling in Mozambique, Market Systems Resilience to Mitigate the Impact of COVID 19, Strengthening the Enabling Environment of the seed subsector in Mozambique, and Developing the Seed Sector in Northern Mozambique, and Building the Output Markets for Agricultural Commodities for Smallholder Farmers in Northern Mozambique.

About the authors

Rui Ribeiro has been a technical advisor to InovAgro since its inception in 2010. As one of the leading seed policy experts in Mozambique, he has been engaged in supporting the work on the seed sector enabling environment. He was supported in drafting this case study by William Grant, the Knowledge Management Advisor for InovAgro, who has also supported the project since 2010 as the Technical Director.

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Team Leader, InovAgro

EXECUTIVE SUMMARY

1. The development of a Private Sector Seed Inspectors (PSSI) model was led by the Seed Department (SD) of the Ministry of Agriculture and Food Security (MASA) starting in 2015. The initiative was promoted and actively assisted by InovAgro and, later, it was also supported by other partners. This case study aims to document the experience, results, and lessons learnt in implementing this program.

2 The seed certification process requires that seed production be controlled and approved by qualified seed inspectors legally accredited to exercise this function. In Mozambique this function was performed exclusively by the SD until very recently. The SD has severe technical and financial limitations to respond to the growing demand of inspections from seed producing companies. These create deficiencies in the public inspection of seed production that increase the risk of placing low quality certified seed on the market. This, in turn, contributes to the farmer loss of confidence in relation to certified seeds produced in the country. In view of the difficulties they are facing, some companies expressed interest in creating their internal seed inspection capacity, as private sector companies participate in seed certification in other countries.

3. InovAgro engaged with the SD and seed companies to address this problem by increasing the role of the private sector to improve the process of certification of seeds produced in the country. Initially, InovAgro held consultations in 2015 with the SD and seed companies with a view to building consensus on the relevance, objectives and implications of such initiative and what would need to be done to implement it. As a follow-up of those consultations, SD staff and a private sector representative visited Zambia and Kenya, to learn from their experience in engaging the private sector in the seed certification system. The visit provided important elements for designing the PSSI model to be introduced in Mozambique, which was done by SD with assistance from InovAgro and discussed at a seed stakeholders' seminar held in Chimoio in November 2015. The legal instrument required to complement the existing Seed Regulation for licensing of private inspectors and seed laboratories was then formulated and published in September 2017.

4. The SD designed the PSSI training program and conducted two courses, both in Manica Province. The first one lasted five days from July 2nd to 6th, 2018. The second one was done from 9 to 20 August 2021. In total twenty-five candidates participated in the two courses (ten in the first and fifteen in the second) of which seventeen participants were from seed companies (ten in the first and seven in the second), five from training institutions and three from FAO projects (all attended the second event). Twenty trainees successfully completed the two trainings (six in the first and fourteen in the second) of which twelve are from ten seed companies and eight from the training institutions and projects. Three women participated with success in the two events (one in the first and two in the second).

The prices of both courses were the same: 30,000 MZN/trainee for training fee and 3,000 MZN for issuing the license. Both events were co-financed by MADER, InovAgro and other projects, being the training fees and the logistic costs of the trainees paid by their seed companies, apart some small companies which participation was co-financed by projects.

The participants' evaluation of the two courses was similar. They consider that the courses were relevant for the companies, the content was good and met the expectations, the trainers showed good mastery of content, dedication and good ability to transmit knowledge.

5. Two seed companies, Zembe Seeds and Nazara Yapera Seeds, which had certified PSSI on staff since 2018 were interviewed to assess the benefits of the PSSI training for their businesses. Both companies believe that the investment contributed to improve substantially of their seed productivity and quality and their reputation in the market are improving.

6. The experience of implementing this model is still short, but some findings and lessons have emerged from it. The success cases mentioned above provide evidence that the PSSI model brings clear benefits for

the private and public seed actors which ultimately contributes to the development of the national seed industry. However there are important challenges that should be monitored and addressed in the near future with the aim of improving and consolidating the model.

6.1. The demand from companies for PSSI is still small due to several factors: (i) Only companies that produce certified seeds in the country and seek to improve their position in the market by supplying high quality seeds, need regular and effective inspections. These are small and medium-size companies and only a few reach a scale of production that justifies investing in their own inspection capacity, reducing dependence on irregular and costly public inspections. (ii) The effective demand for certified seeds is small but it's growing gradually, with the initiatives to promote the demand and to improve the commercial seed supply network, in which InovAgro has been playing a determining role. (iii) The subsidized supply of seed by MADER and NGOs to smallholder farmers (SHF), now reaching 4 to 6,000 Tons/year, is becoming dominant, distorting the market, and reducing the effective demand from SHF. (iv) The increasing volumes of fake seed entering in the local markets is also a major disincentive for private investments in the national seed industry. (v) Most seed-producing companies, despite being confronted with the ineffectiveness and inefficiency of the public inspections, have not yet realized the advantages of creating their own seed inspection capacity. InovAgro carried out a PSSI Value Proposition study that demonstrates the technical and economic advantages of the PSSI model for seed companies, confirmed by the cases of Zembe Seeds and Nzara Yapera, to be shared with the seed companies.

6.2. SD has shown commitment to develop the PSSI model and technical capacity to provide quality training to private inspectors. However, the SD faces strong financial limitations that can reverse the current trend of developing the model. The SD's annual budget does not cover its normal operating expenses. Even though the SD charges participation fees and could use this to cover PSSI training, it does not have financial autonomy to collect and manage the revenue got from the provision of such services.

6.3 Three major interconnected challenges, linked to the demand and supply sides of the training, remain for the development and consolidation of a sustainable PSSI model: (i) the interest of the private seed companies on the model; (ii) the SD's ability to continue providing training; and (iii) MADER's commitment to the model.

6.3.1. The adoption and sustainability of the PSSI model depends greatly on the increase of the interest of private companies to invest in the development of in-house inspection capacity of their seed production for certification. The interest of companies will increase only if the market for certified seeds grows in a commercially sustainable way, the economic and regulatory environment encourages the private investment in the seed industry, and the cost/benefit ratio of the PSSI investment is interesting.

To stimulate the effective demand and the commercial supply of certified seeds directly to SHF by seed companies and agrodealers on a competitive basis, MADER should urgently adopt a specific inputs distribution policy using commercial distribution channels, discontinuing the current model of distribution of seeds to small farmers not through the established commercial distribution channels but directly through emergent farmers and local traders, that distorts the market, It is also urgent that MADER takes measures to eliminate the distribution of fake seed in the local market.

It is essential that companies are aware of the advantages of having their own PSSI system. The SD in collaboration with MOSTA and APROSE should widely disseminate the PSSI value proposition study made by InovAgro.

6.3.2. The continuity of the PSSI model is highly dependent on the SD's capacity and its will to carry out its responsibilities effectively and efficiently. However, in the new structure of MADER, approved in 2020, the public functions in relation to the seed sector are spread over several National Directorates. This is impacting negatively on the competencies, autonomy, and capacity of the SD. This situation is exacerbating the chronic financial constraints of the SD, reducing its ability to promote and assist the development of the PSSI model. MADER intends to review the structure to ensure that the SD has the necessary competencies

and autonomy to exercise its mandate as defined in the Seed Regulation. This restructuring may contribute to improve SD budget and financial autonomy.

6.3.3. MADER's commitment to the PSSI model has not yet been affirmed, nor is there any evidence that this issue is being analysed internally. The intention of the institutional review mentioned above can be an opportunity to promote the dialogue with seed companies to get MADER's full support for promoting Private Sector active participation in the national seed certification system.

7. Conclusion: The promotion of the PSSI model was a timely and relevant initiative to improve the certification process of seeds produced in Mozambique. Empowering the private seed sector to inspect their own seed production fields under SD supervision, allows the SD to extend the coverage and improve the quality of inspections in the face of constrained resources, while also enhancing the capacity of the seed companies.

Key conditions for expansion of the model were established. The continuity and consolidation of the PSSI model requires (i) a commercially sustained development of the national market of certified seed to encourage private investment in the production of certified seed in the country; (ii) the adoption of public policies that encourage the development of commercial seed markets; (iii) the increase of companies' awareness of the PSSI value proposition; (iv) the creation of institutional conditions for the SD to perform its functions effectively and efficiently; and (v) MADER's commitment to the PSSI model.

The private seed companies, through MOSTA and APROSE, should join forces with other partners to dialogue and support MADER in creating these conditions.

Even if these conditions are effectively established, the national seed industry will still develop slowly and, consequently, the demand for PSSI will grow slowly. In these circumstances, the training of PSSI will not be financially sustainable in the short term. Considering the great public benefit from the PSSI model in terms of increased quality of seed being used by farmers, the training should continue to be partially subsidized, but also regularly adapting the funding modality of the first two courses to increase likelihood of sustainability. MADER and APROSE should join efforts to mobilize additional funding from interested partners to subsidize the PSSI training for at least two more training cycles.

INTRODUCTION

The development of a Private Sector Seed Inspectors (PSSI) model was led by the Seed Department (SD) of the Ministry of Agriculture and Food Security (MASA)[1]. The initiative was promoted and actively assisted by InovAgro and, later, it was also supported by other partners[2]. This case study aims to document the experience, results, and lessons learnt in implementing this program.

The methodology was based on review of documentation and interviews with key informants (SD, participating private seed companies, seed inspectors trained and licensed, APROSE, MOSTA).

This report provides the background of the initiative, a brief description of the activities and results achieved and an analysis of the experience, the lessons learnt, the challenges and perspectives for the development and consolidation of the model.

BACKGROUND

The reasons behind the adoption of the PSSI model

The seed certification process requires that seed production be controlled and approved by qualified seed inspectors legally accredited to exercise this function. There are usually 3 to 5 inspection visits throughout the production cycle of each seed production field[3]. In Mozambique this function was performed exclusively by the SD until very recently.

The SD has severe technical and financial limitations to respond to the growing demand from seed producing companies that need SD inspections to certify their seeds. The SD has been covering less than 50% of the areas registered for public inspection annually and these areas have only been inspected 1-2 times per production cycle[4]. Quality certificates are issued if fields pass these 1-2 inspections, and the seed quality is confirmed by laboratory analysis after processing. Seeds produced in fields not inspected are only submitted to final laboratory quality control and certified if they meet the required standards. These deficiencies in the public inspection of seed production increase the risk (which is already high due to other factors) of placing low quality certified seed on the market. This, in turn, contributes to the farmer loss of confidence in relation to certified seeds produced in the country.

In view of the difficulties they are facing, some companies expressed interest in creating their internal seed inspection capacity, as private sector companies participate in seed certification in other countries. The motivation of these companies, that produce and process seeds in the country, was above all to reduce dependence on a service that could not meet their needs and to ensure that their seeds were officially certified with the necessary quality standards to compete successfully on the market.

[1] The Seed Department (SD), also known as the National Seed Authority (NSA) is now integrated in the Ministry of Agriculture and Rural Development (MADER), created in March 2020, replacing MASA.

[2] FAO, Agency for the Development of the Zambezi Valley and the USAID funded Seed Trade and Semear Projects.

[3]. The number of inspections depends on the type of crop and seed category. Four field inspections must be carried out (pre- or post-sowing, at the vegetative stage, at the flowering stage and at the maturation stage before harvest) and one during/after processing to verify the conditions of the lots and to collect samples for quality laboratory analysis.

[4] Information provided in by Elsa Timana, Head of the Seed Department, during the interview.

Building consensus and mobilizing partners for the PSSI model

InovAgro engaged with the SD and seed companies to address this problem by including the private sector to play a role in the process of certification of seeds produced in the country. To start the process, InovAgro held consultations in 2015 with the SD and seed companies to build consensus on the relevance, objectives and implications of such an initiative and the requirements to implement it.

In those consultations, it was first verified that there was a legal framework for the participation of the private sector in the seed certification process carried out by the public sector. Such participation is foreseen in the Seed Regulation[5], but it was lacking a specific legal instrument establishing the norms and procedures for the licensing of private inspectors and seed laboratories.

Given the lack of knowledge of the SD and of seed companies about how the private sector could engage in the seed certification system, it was agreed to analyse the experience of other African countries. InovAgro supported study visits to Zambia and Kenya, where two different models of private sector engagement in the seed certification system had been in application for some time. This visit was carried out in August 2015, and was attended by the Head of SD and one technician, one representative from the Private Seed Sector and the Seed Specialist of InovAgro. The visit provided important elements for conceiving the PSSI model to be introduced in Mozambique and for the formulation of complementary legislation to operationalize private sector participation in the seed certification process.

ROLLING OUT THE PSSI MODEL

Designing the PSSI model and developing the legislation

The PSSI model was designed by SD with assistance from InovAgro and discussed at a seed stakeholders' seminar held in Chimoio in November 2015. This model consists of the following:

• Interested companies propose their internal Seed Inspector candidates for evaluation by the SD;

• Applicants must meet the following requirements: Have at least a medium-level degree in agronomy; belong to a company or institution licensed to carry out activities in the seed subsector;

• Approved candidates pay a training fee of MZN 30,000 and a licence fee of MZN 3,000;

• SD designs and conducts training courses for selected candidates;

• SD issues Seed Inspector licenses to candidates who have successfully completed the training. The license must be renewed annually;

• Licensed Inspectors are responsible for inspecting their companies' seed fields following the rules and procedures established by the SD, including producing reports of each internal inspection visit in SD´s standard templates, and submitting them to the SD for review;

• SD assists the licensed Inspectors during their first year of service to improve their performance and it organizes regular refresher training;

• SD carries out inspections to audit the work of private inspectors to approve/reject the seed production fields; and

• SD can apply penalties to inspectors and companies that violate established rules and procedures.

[5] Decree 12/2013 of 10 April – Seed Regulation

InovAgro supported the SD to elaborate the specific regulation to operationalize the licensing of private inspectors and seed laboratories, which is in line with the model described above. The regulation was approved by MASA in June 2017 and published in the official gazette in September 2017[6]. It was widely disseminated by the SD at seed stakeholders' meetings supported by InovAgro[7]. Under this regulation, private seed inspectors are accredited to inspect their own companies' seed production fields (including those of their out-growers), and the SD audits the quality of the work of the PSSIs, verifies compliance with legal procedures, and approves or rejects the internal inspections of the company. An electronic system has been set up by SD with support of SeedTrade to allow for the collection of the reports from the private seed inspectors, which are audited by the public inspectors at the SD regional laboratories and then communicated back to them.

Training of Private Seed Inspectors

The SD designed the training program for private inspector candidates and produced a technical manual to guide the inspectors' work, which was used during the training. The program included a first part of sessions on relevant topics such as the seed supply chain, seed legislation, seed release and registration, seed technology, the quality control and seed certification system and the techniques and procedures for inspection of seed production fields. The second part is dedicated to practical field training, during which trainees participate in inspection of a company's seed production fields.

The First Course[8]

The first course lasted five days and was held in Manica Province from July 2nd to 6th, 2018. The course was conducted by five technicians from the SD, including the Head of SD, Elsa Timana. The prices set were 30,000 MZN/trainee for the course, paid as a registration fee[9], and 3,000 MZN for issuing the license. InovAgro financed much of the course, covering the costs of producing the inspector's technical manual and the travel and accommodation expenses of the SD trainers, the rental of facilities for the classroom sessions and some of the fieldwork logistics. The Seed Trade Project co-financed the preparation of the manual. Participating companies covered the travel and accommodation costs of their technicians and course registration fees. Phoenix Seeds provided the seed fields for the practical training.

Twenty technicians applied, sixteen from seed companies and four from other institutions. Of these seven were rejected for not meeting the required qualifications. Ten of the thirteen candidates accepted, all of them from seed companies, paid their course registration fees and participated (of which one woman). In the end, six trainees (one woman) from four companies successfully completed the training and were graduated: one from Phoenix Seeds, two from Companhia do Zembe, two from Sementes Nzara Yapera, and one from Agroserv.

The main conclusions from the course evaluation made by the participants were: The course was relevant and timely for companies; the content was good and met the expectations; trainers showed good mastery of content, dedication and good ability to transmit knowledge; the duration of the course was too short, especially the practical part; the period of the crop season in which the training was done didn't allow to observe the four stages corresponding to the inspection phases.

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[6] Ministerial Diploma No. 58/2017 of 13 September - "Complementary Rules for the Licensing of Inspectors and Private Seed Laboratories"

[7] Seed Sector Investment Opportunities Conference (August 2017) and Seed Sector coordination meeting (September 2017) and various other stakeholders' meetings in 2018.

[8] Source of data: Report "Technical Support Consultancy to the National Seed Authority", Celso Ruface, COWI, July 2018

[9] This fee was established by the SD to cover its training costs (salaries, travelling, accommodation and per diem, training material). SD didn't provide the breakdown of its training cost. All seed firms interviewed consider the training fee and the cost of the license quite reasonable. The amounts paid for the fees and licenses are channelled to the Ministry of Economy and Finance through MADER Finance Department and can´t be used by the SD.

The companies and licensed inspectors interviewed during this study confirmed these findings. They also confirmed that the SD Regional Seed Laboratory (RSL), located in Chimoio – Manica Province, performed field visits and checked data submitted by the PSSI regularly and effectively for auditing the companies' internal inspections. They expressed their satisfaction with the quality of assistance provided by the RSL Inspector which contributed to improving the knowledge and practices of the private inspectors.

> *As an agronomist I only knew how to produce crops. The training gave me knowledge on how to produce quality seeds. The course was well structured. The trainers are experienced people and have good skills to address the different topics and to frame each trainee needs, taking into account their knowledge and deficiencies. I am very pleased with the assistance from the RSL staff and also with the guidance of IIAM's plant breeders.* ***Armindo Cavale, Agronomist, Head of Production and Seed Inspector of Companhia do Zembe***

The Second Course[10]

The second course was initially scheduled for March 2020, then was postponed to March 2021 due to the COVID pandemic. It was postponed again, due to the fields not being properly prepared and the 2nd wave of COVID; it was finally held from 9 to 20 August 2021, in Manica Province. Considering the experience and recommendations of the first course, it lasted for two weeks (eleven working days). The first week consisted of classroom sessions on the same themes of the first course which were treated more comprehensively and with greater interaction with the trainees. The second week was field practices and included visits to the Companhia do Zembe warehouse and processing plant, and to the RSL. The prices for the course and for issuing licenses were the same as for the first course.

Figure 1: field inspection

Figure 2Classroom training with Elsa Timane

This course was organized by SD with assistance from APROSE, who managed the communication and marketing of the event, logistics and part of the expenditure budget. InovAgro financed APROSE's participation costs, the rental of facilities and catering for classroom training and the logistics of field training. The Seed Trade Project paid for travelling, accommodation and per-diems of the SD trainers. Participating companies and institutions covered their

[10] Source of data: "Private Inspectors Training Report, Chimoio August 09-20, 2021", APROSE, August 2021

technicians' travel and accommodation costs and course registration fees. FAO fully funded the participation costs of four trainees (one from a company and staff from three of their projects), the Zambezi Valley Development Agency covered the total costs of four participants from technical education institutions and the SEMEAR project funded 40% of the costs for participation of two trainees from two small seed firms. The medium to large seed companies paid for all the direct costs of their technicians. The seed fields for the practical training were provided by Companhia do Zembe and Phoenix Seeds.

Nineteen candidates (two women) were registered, of which four (one from a company) ended up not participating. Of the fifteen participants, seven came from five seed companies, five were from universities and mid-level agriculture schools[11] and three work on FAO projects[12].

Figure 3: The Participants

Fourteen trainees were certified (including the two women): six seed company technicians (one from Companhia do Zembe, two from Klein Karoo, one from Olima Farm, one from Easi Seeds and one from Oruwera), the five participants from the education institutions and the three from FAO. One trainee from a seed company was not approved.

The course report did not include an evaluation on the quality of the course, but the successful participants interviewed during this study expressed similar opinions to the first course's trainees. They were very satisfied with the quality of the course and the trainers, and considered the duration, structure, and methodology of the course to be adequate. Some interviewees suggest that in future courses, leaflets with data on the characteristics of the most common varieties produced for the market should be provided to trainees. It was also suggested to include training in the SD system for online registration of seed fields for inspection. All the interviewees mentioned that the practical component was negatively affected by the strong winter frost that harmed the fields prepared for training. The general view

> *The course was positive and gave me new skills to improve my activity in the company. I now know the rules and procedures needed to improve seed quality. There was some deficiency in the practical part, as it was not possible to carry out inspections in the different phases of the crops.* ***Marília Chaimite, Agronomist, Responsible for seed quality at the ORUWERA Company***

[11] Two universities, one high level technical institute and three mid-level agriculture school decided to participate in the course because their trainers have limitations to deal adequately with seed production matters, which is part of their training curricula. They also envisage to assist farmers of neighbouring areas in producing certified seeds. The training costs were covered by the Zambeze Valley Development Agency and FAO.

[12] The three FAO agronomists work in PROMOVE project and other initiatives that are assisting small farmers in production and supply of improved seeds

is that SD should assist new inspectors to improve their skills through mentoring during audit inspections in the next agricultural season complemented by short refresher trainings, which will be paid by the participating seed companies. The SD and the RSL confirmed that they will meet this demand.

Seed company case studies

Two seed companies which had certified PSSI on staff since 2018 were interviewed to assess the benefits of the PSSI training on their businesses.

Zembe Seeds

Companhia do Zembe SA is a private seed company created in 2011 by António Manjate the General Manager and shareholder. Zembe operates from Chimoio, Manica Province and it produces, processes and sells certified seeds (OPV and hybrid maize, soy, common bean and cowpea). The entire production of certified seeds, except for maize hybrids, is carried out by contracted out-growers, of which 80% are small holder farmers and 20% commercial farmers. The company has a processing plant with a capacity of 5 ton/h and supplies seeds across the country through its network of distributors and agrodealers.

According to Antonio Manjate, the company decided to create its own seed inspection capacity because inspections by the SD's Regional Seed Laboratory were insufficient, given its limited resources, and the cost was high. Zembe sent four technicians to the first Seed Inspectors course, two of which were certified and licensed. The company believes that the investment brought clear advantages: (i) seed production rose from 450 tons in 2019 to 700 tons in 2020, mainly due to increased productivity of the seed out-growers; (ii) there was a significant reduction in seed mixtures in the field, which contributed to a substantial improvement in the quality of seeds delivered for processing, which reduced the time and costs of the post-harvest selection process; (iii) the selection of outsourced producers became more rigorous and effective with the company now shifting the contracts to more efficient commercial farmers; and (iv) improved dialogue and relations with the SD.

Due to these results and given the company's growth prospects in the seed market, Zembe now has one more seed inspector licensed from the second course and intends to invest in training three more technicians.

Nzara Yapera Seeds

Nzara Yapera is a private family business created in 2009 with the aim of producing and marketing certified seeds and plant seedlings, operating from Manica Province. Elizabeth Sikoya is the General Manager and shareholder. The company produces certified seeds of OPV maize, common bean, pigeon pea and sesame, with 40% produced in its own farms and 60% produced by contracted out-growers. It sells throughout the country through distributors and agrodealers.

Nzara Yapera also adhered to the PSSI model because inspections of the SD did not meet its needs and were costly. The company has two licensed Inspectors trained in the first course. Elizabeth considers that the training carried out by SD was of good quality and that the company benefited a lot from the activity of

> *The trained inspectors brought new technologies. Before, we had pests and problems that we only detected very late. Now they do regular scouting of the fields and bring the information in time for us to take action. They are the ones who carry out field research to find out what we have to apply to improve production, and who determine which seed fields are in good condition and which have to be rejected. The investment was worth it. Our productivity and seed quality have greatly improved.* ***Elizabeth Sikoya, General Manager of Nzara Yapera***

its inspectors. There have been clear improvements in the company's seed technology. Their own production practices as well as those of the out-growers were improved, which contributed decisively to the increase in productivity and seed quality. Due to this, the company's position in the market has also improved.

ANALYSIS OF THE EXPERIENCE, LESSONS LEARNT AND CHALLENGES FOR THE FUTURE OF THE PSSI MODEL

The experience of implementing this model is still short, but some findings and lessons have emerged from it. The success cases mentioned above provide evidence that the PSSI model brings clear benefits for the private and public seed actors which ultimately contributes to the development of the national seed industry. However there are important challenges that should be monitored and addressed in the near future with the aim of improving and consolidating the model.

The demand from companies for PSSI remains small

There are several types of companies registered for the seed business, but only companies that produce certified seeds in their own fields and/or through contracted outgrowers, seeking to supply high quality seeds to improve their position in the local markets, need regular and effective inspections. These are small and medium-size companies and (despite the key contribution of the PSSI to increase seed productivity and quality), only a few reach a scale of production that justifies investing in their own inspection capacity, reducing dependence on irregular and costly public inspections.

There are no recent estimations of the effective demand for certified seeds, but it is still small although it has been growing mainly due to initiatives to promote demand and to improve the commercial seed supply network, in which InovAgro has been playing a determining role together with seed partners. There is no data available on the total volume of free/subsidized seed supplied by MADER and NGOs, but indications are that it was in the order of 4,000 tons of seeds in the last agricultural season[13] and it may grow to between 5,000 and 6,000 tons in the next season, being a good part imported seed[14]. Therefore, this demand by MADER and relief NGOs does not incentivise local seed companies to invest in PSSI as it is short term and most of the seed is imported. Moreover, it distorts the market discouraging companies from investing in the certified seed supply chain. The increasing volumes of fake seed entering the local markets is also a major disincentive for private investments in the national seed industry[15] as the fake seed sells at much lower prices, reducing the potential demand from genuine seed in a market with price sensitive farmers.

Most seed-producing companies, despite being confronted with the ineffectiveness and inefficiency of the public inspections, have not yet realized the advantages of creating their own seed inspection capacity. The fact that the SD has been certifying seeds based on one or two field inspections complemented by laboratory quality control of seed processed samples, or just by doing these analyses without any field inspection,

[13] As per SD data, MADER distributed 2,993 tons of grain crops' seeds, of which 66% was imported.

[14] The imported seed is generally expensive and could largely be produced locally and delivered at lower prices. But MADER is placing the orders too late (August/September). This doesn't allow national seed companies to plan the production in the previous crop season to meet MADER demand.

[15] 200 tons of seed with false certificates were detected by the SD in the market during the last crop season.

constitutes a disincentive for companies to build their internal seed inspection capacity (especially companies with fewer resources and less market ethics).

Due to these factors, the current demand from private companies to train their own seed inspectors, is still small. Data of the first two courses demonstrate this. Only twelve companies submitted candidates for the two courses, of which three ended up dropping out. In total, the twelve companies submitted twenty-six candidates for the two courses, of which only seventeen participated.

A study carried out by InovAgro[16] demonstrates, among others, the following advantages of the PSSI model for companies: (i) The productivity and quality of the seeds produced can be substantially increased due to the existence of a qualified Inspector who technically guides and controls the entire seed production and processing; (ii) Production costs can be reduced by applying good agricultural practices and by correcting problems that, if not avoided, can cause high rejection rates of seed production fields and/or low pack out ratio at processing; (iii) The company improves its reputation and market share; (iv) The dependence on the SD inspections decreases and the costs of the PSSI model are substantially lower than the fully public inspection model[17]; and (v) The cost/benefit ratio of the PSSI model is much more advantageous than that of the fully public model, due to gains in productivity and seed quality, combined with reduced inspection costs.

The cases of Zembe Seeds and Nzara Yapera described above confirm the conclusions of the InovaAgro PSSI Value Proposition study.

SD commitment with the PSSI model is evident, but the model is not yet a priority for MADER

The SD recognizes that the PSSI model brings two major advantages to the seed certification system: it reduces the pressure of the demand for inspections (for which it has constrained capacity to respond), and it allows expanded the coverage and quality of field inspections. These will contribute to improving the effectiveness and quality of the seed certification process.

For these reasons, the SD has shown commitment to developing the PSSI model. According to the opinion of the companies and technicians participating in the courses carried out, the SD has shown that it has the technical capacity and commitment to provide quality training to private inspectors. However, the SD faces strong financial limitations that can impede or even reverse the current trend of developing the model. The SD's annual budget does not cover its normal operating expenses and does not include a specific allocation for the formation of PSSIs. SD does not have financial autonomy to collect and manage the revenue got from the provision of services (PSSI training, laboratory analysis, seed certification, licensing seed companies) to cover expenses of priority activities. For this reason, projects fully financed the travel, accommodation and per diem of the trainers of the two PSSI courses.

Unfortunately, until now, MADER has not given attention to the PSSI model and it seems that the training and supervision of PSSI is not yet considered a priority.

One important issue to resolve: The renewal of PSSI licenses

Until now, the licenses of four PSSIs certified in 2018 and still in operation have not been renewed[18]. The legislation establishes that an PSSI's license is valid for one year, renewable and that it can be maintained,

[16] Value Proposition for Seed Companies to invest in own Private Seed Inspectors, August 2021, Noel Mutasa, InovAgro

[17] Over a 4-year period, the cost of the PSSI system (which includes the costs of training and issuing the license, the costs of own inspection + 1 SD audit inspection) is, respectively, about 1.3 and 2.1 times less than the cost of 3 and 5 mandatory inspections of the fully public system.

[18] Information obtained from interviews with companies and PSSI and confirmed by SD. Of the 6 previously certified PSSIs, 4 are in functions in 3 companies and 2 left the companies they belonged to.

suspended or revoked as a result of the evaluation of the PSSI's performance carried out by the SD[19]. The legislation does not define how this assessment shall be done. According to the SD, the renewal of the PSSI license depends on the positive evaluation of the PSSI performance during the public audit inspections and his participation in refresher training. The first requirement was accomplished. SD inspected and approved the work of the first licensed PSSI during the first two crop seasons. However, none of the licensed PSSI participated in the second course. Due to this it can be considered that legally the PSSI can't continue doing their work because their licenses have expired. But the participation on refresher training is not established in the legislation and, in view of this, the licenses of the four PSSI could be extended based on the assessment of their performance done by the SD. Unfortunately, there has been no dialogue between the SD and interested companies to settle this matter.

The major challenges for the future of the model and recommendations

Three major interconnected challenges, linked to the demand and supply sides of the PSSI training, remain for the development and consolidation of a sustainable PSSI model: (i) the interest of the private seed companies on the model; (ii) the SD's ability to continue providing training; and (iii) MADER's commitment to the model.

(i) On the demand side, the development of the PSSI model depends greatly on the increase of the interest of private companies to invest in the development of in-house inspection capacity of their seed production for certification. The interest of companies will increase only if the market for certified seeds grows in a commercially sustainable way, the economic and regulatory environment encourages the private investment in the seed industry, and the cost/benefit ratio of the PSSI investment is interesting.

The brief analysis of the current situation and short-term trend of the seed market, above, highlights that demand for seeds has been growing slowly but steadily and it will increase with the growth of commercial crop production for the market. The Mozambican Government's and MADER's medium-term strategy and plan give priority to the production of food crops for the domestic market and of export commodities. But this policy priority does not, by itself, determine a favourable evolution of the seed market that encourages the private sector to produce and supply certified seeds of high quality. MADER should adopt urgently a specific inputs distribution policy to stimulate the commercial supply of high-quality certified seeds and other agricultural inputs directly to SHF by seed companies and agrodealers on a competitive basis, discontinuing the current model of highly subsidized distribution of input kits for small farmers that distorts the market. It is also urgent that MADER takes measures to eliminate the distribution of fake seed in the local market. These are key policy measures for the development of a commercial seed market, and it will stimulate private seed companies to lead and invest in promoting the market demand for certified seeds.

It is essential that companies are informed about the advantages for increasing productivity, quality, and reduced seed inspection costs of having their in-house seed inspection system. The SD in collaboration with MOSTA and APROSE should widely disseminate the study and the marketing brochure on the PSSI Value Proposition made by InovAgro.

More than 50% of the participants in the second PSSI Course are from educational institutions and projects that support the production and marketing of seeds. The financial sustainability of the PSSI model cannot depend on this type of non-commercial institutions, which, in fact, are not designed to supply the seed market. However, in the short term, the participation of this type of institution should be promoted by SD and supported by funding partners because it can contribute on one side to improve their curricula on seed matters and, on the other side, to reduce the cost per trainee due to a scale effect.

[19] See Articles 6 and 7 of Ministerial Diploma No. 58/2017 - "Complementary Rules for the Licensing of Inspectors and Private Seed Laboratories".

The cost per trainee can be lowered if the SD revises the composition and reduces the size of the team of trainers. Five trainers from Maputo participated in the first courses, with their travel, accommodation and daily costs representing around 35% of the budget, excluding trainees' participation expenses[20].

(ii) On the supply side, the continuity of the PSSI model is highly dependent on the SD's capacity and will to carry out its responsibilities effectively and efficiently: training, mentoring and recycling the PSSIs and conducting regular audit inspections. However, in the new structure of MADER, approved in 2020, the public functions in relation to the seed sector are spread over several National Directorates. This is impacting negatively on the competencies, autonomy and capacity of the SD. This situation is exacerbating the chronic financial constraints of the SD, reducing its ability to promote and assist the development of the PSSI model. Evidence of this is the dependence on project funding to carry out the courses and the need for the SD to resort to companies to cover the travel costs of public inspectors to carry out audit inspections. However, there are recent indications that MADER intends to make changes in its structure to maintain in the SD the necessary competencies and autonomy to be able to exercise its mandate as defined in the Seed Regulation. Hopefully, this restructuring can be done in the short term to allow the SD to get a strengthened expense budget and greater autonomy in financial management.

It´s important to note that there is no external funding committed to cover the participation costs of SD trainers in next courses, given the closing of the two projects that has been financing these costs. SD costs of the next training cycles should be covered by MADER budget and recuperated though the PSSI training fee paid by the participating firms. The same arrangement should apply to cover/recover the costs of field inspections to audit PSSI work.

If SD will not be allowed to manage the revenue of the PSSI training fees, the option of engaging APROSE or a private service provider to organize the training and manage the budget should be considered. They would charge the training fee and pay all costs of SD staff (remuneration, travelling, accommodation and per diems) and of the field work logistics. The value of the SD staff remuneration would be transferred by the service provider to MADER.

(iii) MADER's commitment to the PSSI model has not yet been affirmed, nor is there any evidence that the issue is being analysed internally. This is an indication that the new MADER leadership and structures are probably not aware of the reasons that led to the introduction of the PSSI model, as well as of the advantages for the seed certification process. The intention of the institutional reform mentioned above can be an opportunity to promote a reflection and dialogue with seed companies to get MADER's full support for promoting Private Sector active participation in the national seed certification system.

CONCLUSIONS

The promotion of the PSSI model was a timely and relevant initiative to improve the certification process of seeds produced in Mozambique. Empowering the private seed sector to inspect their own seed production fields under SD supervision, allows the SD to extend the coverage and improve the quality of inspections in the face of constrained resources.

It has been a six-year journey, from the first discussions with stakeholders until the completion of two rounds of training. In the first three years, under the leadership of the SD and with the support of InovAgro, the model was conceived in consultations with the seed sector partners based on the experience of other countries in the region, the regulation was drafted and the enabling environment established. Then, over the last three years the model was put into application with the support of numerous external funders (InovAgro, Seed Trade, SEMEAR, and FAO) and facilitation from APROSE to test the effectiveness.

[20] According the 2nd course budget prepared by APROSE. This budget doesn´t include the remuneration of SD staff

Key conditions for expansion of the model are now established: the legislation to license inspectors and private seed laboratories is approved, the training program and the manual are operational, and the methodology for SD supervision and control of private inspections is defined. Two good quality training events were carried out. The number of participants from seed companies in these trainings was small, but it was within expectations of an initial testing phase and that the number of companies producing certified seeds in Mozambique is still small. The interviewed companies highlighted gains in productivity and quality of their seeds with the adoption of an internal seeds inspection system. The companies that already have licensed inspectors confirmed interest in developing their internal capacity and some other companies contacted during the study showed interest in investing in PSSI.

The continuity and consolidation of the PSSI model requires five main conditions:

- the development of the national market of certified seeds, sustained by commercial, transparent and competitive practices, to encourage private investment in the production of certified seed in the country;
- the adoption of public policies that encourage the development of seed markets in commercial and competitive ways;
- increase of companies' awareness of the PSSI value proposition and desire to invest in the training;
- creation of institutional conditions for the SD to perform its functions effectively and efficiently and to capture and manage the revenue from the delivery of the courses; and
- MADER's commitment to the PSSI model.

The private seed companies, through MOSTA and APROSE, should join forces with other partners to dialogue and support MADER in creating these conditions.

Even if all these conditions are effectively established, the national seed industry will still develop slowly and, consequently, the demand for PSSI will grow slowly. In these circumstances, the training of PSSI will not be financially sustainable in the immediate future. Considering the great public benefit from the PSSI model in terms of increased quality of seed being used by farmers, the training should continue to be partially subsidized, but also regularly adapting the funding modality of the first two courses to increase likelihood of sustainability. MADER and APROSE should join efforts to raise additional funding from interested partners to subsidize the PSSI training for at least two more training cycles.

I am very pleased with the introduction of the PSSI. Things have improved a lot. In the company, the skills acquired allowed me to provide better assistance to our fields and to out-growers and to carry out rigorous inspections. Relations with the LRS have improved, they are responding better to our needs, the time required to come and inspect the company fields has decreased and the introduction of the online registration system has brought many advantages, ***Rosa Biningu, Agronomist, Técnica and Seed Inspector of Nzara Yapera***

ANNEX 1: LIST OF INTERVIEWEES

Name	Institution	Position
Elsa Timane	Seed Department MADER	Head
Manuel Cesar Bacicolo	Regional Seed Laboratory – Chimoio, MADER	Head and Seed Inspector
Antonio Manjate	Companhia do Zembe SA (Zembe seeds)	Managing Director and share holder
Charles Mabaie	EASI Seeds	Managing Director and share holder; licensed ISSP (2nd training)
Elizabeth Sikoya	Sementes Nzara Yapera	Managing Director and share holder
Rosa Biningu	Sementes Nzara Yapera	Agronomist and licensed PSSI (1st training)
Amilcar Binate	Oruwera	Managing Director and share holder
Marilia Chaimite	Oruwera	Agronomist and licensed PSSI (2nd training)
Julius Mapanga	Klein Karoo Seed Marketing Moz	Managing Director
Carlos Beira	Klein Karoo Seed Marketing Moz	Agriculture Technician and licensed PSSI (2nd training)
Alberto Macumbire	PROMOVE Project (EU/GIZ/FAO)	Agronomist and licensed PSSI (2nd training)
Josephat Rushing Octavio Queface George Chibanda	Phoenix Seeds	General Manager Marketing Manager Agronomist
Carlos Moamba	Seed Trade Project	Country Advisor
Carlos Malita	SEMEAR Project	Project Manager
Celso Ruface	PROMOVE Project (EU/GIZ/FAO)	Seed Specialist
Cristina Malikito	APROSE	Communications Officer

ANNEX 2: REFERENCES

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