

11

Madagascar: Coping with Relief Aid and Politics

PAUL VAN MELE, KETAMALALA RANDRIAMILANDY,
NOROSEHENO RALISOA AND RAYMOND RABESON

11.1 Introduction

11.1.1 Agriculture

At 400 km from the coast of Africa, Madagascar is the fourth largest island in the world with an area of 587,041 km² and about 20 million inhabitants. The capital Antananarivo in the central highlands is linked to the main harbour, Toamasina, by a well-kept road and railway, illustrating the long-term effect of economic interest groups pressuring successive governments to favour food imports.

The climate varies from humid tropical in the east, to hot and dry in the south-west and north-west, arid in the southern regions and temperate in the central highlands, with altitudes ranging from 800 to 1800 metres. Madagascar is often liable to cyclones, flooding and drought, which continue to influence seed demand and supply.

About 70% of the population lives from agriculture. Because of the diverse climates, altitudes and soils, a wide range of food and cash crops are grown. Rice is grown on 1.3 million hectares (about 45% of the cultivated land in 2006), followed by 0.3 million hectares each of maize and cassava. Sweet potato occupies 122,000 hectares. In the arid south, cassava and sweet potato are the main food crops. In the highlands, potato is grown on an estimated 38,000 hectares (MAEP, 2007).

Family plots are generally smaller than a hectare, whereas in the largest rice production areas, such as Lake Alaotra and Marovoay, fields are larger and flatter, allowing mechanization.



11.1.2 Agricultural policy

The government recognizes the important role of improved technologies such as fertilizers and seeds in ensuring food security, the first objective of its Rural Development Policy (2001). The Madagascar Action Plan (2007–2012) seeks to achieve a high-growth economy by ensuring that the country has a diversified and strong private sector driven by local and international investment and trade. Developing input distribution systems is crucial.

Rice markets have been particularly important, since rice is the staple food and producing it is a major source of income and employment. Levels and stability of rice prices have major effects on the welfare of rice farmers (about 60% of the population) and consumers (almost the entire population). Policies to spur the development of rice markets, stabilize prices and provide appropriate price incentives for producers and consumers have varied considerably over time, alternating between government interventionism and market liberalization (Minten *et al.*, 2006).

In 2006, the government launched its Green Revolution Plan. Measures such as off-season crops, transplanting and improved rice seeds have reduced poverty and food insecurity prevalent in rural Madagascar (Minten and Barrett, 2008). Paddy production grew by 23% in 2009 due to increased productivity and more land cultivated (MEI, 2010).

Paddy prices have been pretty stable and saw a marked price jump only once (in 2004–2005) when the private sector imports had stopped because of high risks involved in the trade and the government short-run efforts to import were not effective (Dorosh, 2008).

As local production increased across the country following the boost of upland rice cultivation and the government's Green Revolution Plan, Madagascar was not affected by the grain crisis in 2008 and paddy prices returned to 450 Ariary (\$0.23) per kg. Currently, the government is considering exporting rice so that growers would no longer face low prices at peak harvest times (Philibert Rakotoson, personal communication, 2010).



Major agricultural zones are poorly connected to cities, reducing the competitiveness of local food against imports.

11.1.3 Evolution of seed sector

Formal seed system. Although as early as 1985 the Malagasy government was committed to getting out of direct agricultural production itself, it continued to guarantee seed production through 20 seed multiplication centres (CMS – Centre de Multiplication de Semence) across the country. Only in 1995, when the seed act

was passed, did the state stop subsidizing seed production and begin to privatize the CMS.

Five centres were immediately privatized, but, as companies had only sold seed and never produced it, the initiative flopped. They struggled to survive and could hardly provide seed. Most other centres, as well as most seed growers' associations, stopped producing seed altogether because they lacked credit, once provided by the state. Only the biggest ones – Anosiboribory near Lake Alaotra, Sakay in the mid-west, Anosy (Fianarantsoa) in the eastern highlands, Marofarihy in the south-east, Tsararano (Marovoay) and Mahabo in the west – benefited from donor funds and were able to survive longer. These two last ones are managed by seed growers' associations. CMS Sakay is the only centre specialized in upland crops (MAEP, 2008).

The seed act allows the CMS to also produce foundation seed. The national agricultural research institutes FOFIFA and FIFAMANOR collaborate with international research organizations and should produce only breeder and foundation seed, but, due to the weak organization of the sector, they also produce commercial seed.

Two private foreign companies were established: Semana (a subsidiary of the French Technisem, to produce vegetable seeds for local use and export) and Castells (a Spanish company that started producing certified rice seed around Lake Alaotra in 2007). Also five national enterprises emerged, including Valy Prod Sem and Andri-Ko.

Under the government's Green Revolution Plan, quality seed was considered key to increasing productivity and the Ministry of Agriculture made a special effort to spread quality seed all over the island through its 22 Regional Departments of Rural Development (DRDR – Direction Régionale de Développement Rural). After receiving foundation seed from research, they provide this seed along with training for members of seed producer groups (GPS – Groupement de Paysans Semenciers), whose production is sometimes bought by the Ministry but mostly sold to neighbours.

Informal seed system. Most farmers are aware of the advantages of improved varieties, but they know that these do not express their maximum performance without mineral fertilizer. Short of cash, most farmers are unwilling to make that investment. Credit, if available, is rarely considered (MAEP, 2008).



Most farmers save their own seed, unless they can get a good price for their harvest.

Although most farmers save their own seed or exchange with neighbours, they may buy seed when they get a good price for their harvest. When farmers are unable to save part of their production or when their harvest fails because of natural disasters or crop diseases, many dealers take advantage and sell cheap, low quality seed, with no label or packaging.

The Malagasy Association for Seed Promotion (AMPROSEM – Association Malagasy pour la Promotion des Semences) organizes workshops to promote quality seed and plays a role in seed policy orientation as a member of the National Seed Council (CONASEM – Conseil National des Semences).

11.1.4 Seed law

The seed act 94-038, covering seed regulation, was enacted in 1995, but the implementation decree was issued only in 2006. It aimed to stimulate private sector investment in seed research, production and distribution, import and export, leaving control and regulation to the public sector.

The 1995 law created several seed institutions, such as CONASEM, charged with policy analysis and orientation, seed promotion and diffusion, and the Varietal Admission Committee (CTAC – Comité Technique d'Admission des Variétés au Catalogue), which records cultivated varieties in a national catalogue.

To implement the seed act, a national seed strategy was written in 2007, and, with support from the FAO, legal texts related to the law and a national variety catalogue were drafted. The first edition of the catalogue will be published in 2010 and will include the most popular landraces, local and improved varieties.

11.1.5 Seed certification

Many seed enterprises rely on internal quality control and sell standard seed (which actually is a legal category for vegetable seed only). The Seed Control Service (SOC – Service Officiel de Contrôle des Semences) is currently under the Ministry of Agriculture (although with every new government its name and organizational set-up has changed) and is in charge of inspecting seed fields, laboratory tests, certification and monitoring of seed distribution. SOC's office is in the same building as the National Seed Laboratory, which was established in 1986.

Before 2004, four inspectors were based in the capital, three in the country's main rice production zone (Lake Alaotra) and two in Toliara in the south-west. In 2010, five inspectors were at the head office and 42 in the regions. Certificates are delivered by the head office only. So far, limited amounts of seed have been certified (Table 11.1), but with the legal texts and catalogue being finalized this is likely to change.

So far, SOC has mainly inspected rice, maize, legume and vegetable seeds, free of charge. Inspectors check seed traceability, field isolation, crop rotation and specific and varietal purity and assess the health status of the crop at least twice. Field reports inform growers whether their fields are accepted or not. Inspectors also sample seed growers' postharvest and storage practices, adhering to the standards of the Organisation for Economic Co-operation and Development (OECD).

Table 11.1. Seed certified (tonnes) in Madagascar, 2004–2009. Source: SOC.

	2004	2005	2006	2007	2008	2009
<i>Rice</i>	1,300	1,550	900	2,045	1,505	No seed was certified in 2009 because of the political crisis
<i>OPV maize</i>	–	–	100	147	120	
<i>Groundnut</i>	–	–	23	26	5	
<i>Bean</i>	–	–	–	37	16	
<i>Lima bean</i>	–	–	–	–	52	
<i>Potato</i>	–	–	–	48	–	
<i>Vegetables</i>	3.5	3.5	3.5	3.5	3	
<i>Total</i>	1,304	1,554	1,027	2,307	1,701	

Seed producers take samples and send them to SOC, but from 2011 onwards this will be done by the regional seed inspectors to reduce handling and lower costs. The National Seed Laboratory at SOC analyses seed samples according to the rules of ISTA (International Seed Testing Association), although it is not accredited.

11.1.6 Seed demand and production

The seed multiplication centres that are still functional have limited capacity and geographical coverage. They are unable to plan their seed production because seasonal seed demand is not clearly assessed and communicated. Most of the demand has come from the government and relief agencies and responds to natural disasters.

Unions of cooperatives are often poorly organized and reluctant to share information. Various platforms have been established, such as the national rice platform and the potato platform in the Vakinankaratra region, but their role in coordinating seed demand and supply has not yet been explored (MAEP, 2008).

Estimating seed demand from the acreage covered by each crop, certified seed production is low. In 2007 improved rice seed production was 2045 tonnes, which was about 2.5% of the total supply. Certified maize seed production was 147 tonnes, representing about 1% of the total. As seed is multiplied by farmers, a much higher share of production is impacted indirectly.

Rice. Seventy per cent of the national irrigated rice seed is produced by the CMS Anosiboribory near Lake Alaotra. Privatized in 2009, it provides seed even for other regions. Also seed growers' associations supported by DRDR or NGOs produce quality seed and directly supply neighbouring farmers. In 2009 the Ministry imported hybrid rice seed from China, which it has tested and began promoting in 2010. As earlier attempts failed because farm-saved seed of hybrid rice does not give a good crop, it seems puzzling why farmers would not abandon it this time.

Maize. FOFIFA selected varieties adapted to the different agro-ecologies. CMS Sakay and some farmer groups are the main producers of standard maize seed. Fertilis Madagascar imports white maize hybrid seed from Pannar (South Africa).

Potato. Selection and production of breeder and foundation seed are done by FIFAMANOR (a Malagasy–Norwegian cooperation for livestock and crop development). This centre produces standard seed on its own land and also buys from farmers' associations when more seed is needed. Some farmer groups are now producing potato and other crop seed themselves within the Vakinankaratra region.

Beans. FOFIFA is in charge of varietal selection and seed multiplication (CALA near Lake Alaotra). Private enterprises produce commercial bean seed, such as Valy Prod Sem in Miandrivazo (middle west).

11.1.7 Politics, trade and environment

Despite the country's wealth in agricultural and natural resources, in 2005 about two-thirds of the population was living below the national poverty line, with a higher proportion in rural areas (IMF, 2009). Politics has had a major influence on the country's development. Decentralization has been extremely slow, with less than 5% of the overall budget under the responsibility of local governments (IMF, 2009). Roads are good where they serve political interests. Main agricultural zones remain poorly connected to the cities, increasing the costs of local food. Seed enterprises either produce mainly for local customers or are obliged to add a high fee for transporting seed to other areas.

Agricultural intensification linked to increased population pressure in the central highlands has caused soil degradation. Deforestation has led to erosion with downstream consequences. Rivers, which used to add fertile silt during the annual floods, have started to deposit sand on the agricultural land, drastically reducing soil fertility. As mineral fertilizers are expensive (compared with seed and grain), seed producers still rely mainly on the natural restoration of soil fertility and will increasingly be challenged to stay in the seed business. Also, irrigation channels such as those in the main rice producing region of Lake Alaotra, need increased maintenance due to the sand deposits.



After deforestation rivers carry more sand and irrigation canals become clogged. Floods no longer deposit silt, which once restored natural soil fertility.

Over the past decade donors have promoted farmers' associations and cooperatives, but most have become dysfunctional shortly after the projects ended. Many businesses in Madagascar, whether for seed or other enterprises, are family-based.

The section below presents three family-based seed enterprises: Valy Prod Sem produces bean seed for local and export markets; Andri-Ko grows cereal seed, mainly irrigated rice; and a farmers' association near Antsirabe grows sweet potato vines, among other crops. We also describe various government institutes that are privatized (SCAA), completely self-financed (CMS – Sakay) or partially financed (FIFAMANOR). The final case describes a potato seed growers' cooperative.

11.2 Valy Prod Sem

11.2.1 History

During the big privatization in the late 1980s, Mr Mbosa Rabenasolo, being a senior government official, received the rice seed multiplication centre in Anosy-Avaratra, which was converted into a cooperative. However, faced with frequent floods and land tenure problems with neighbouring farmers, he abandoned it to start his own enterprise with his brother-in-law, Mr Liva Nirina Rasata, in 1990. They christened the company Valy-Agri, *valy* meaning brother-in-law. (In Malagasy culture women are respected and the man who marries a sister is treated courteously.)

Rather than rice, the new company began trading in bean seed for export. They started collecting dried beans near Miandrivazo in the hot mid-west and shipped two containers of 22 tonnes to France and the United Kingdom. Having been director of the seed and plant material service (SMV – Service des Semences et Matériel Végétal) at the Ministry of Agriculture, Mr Mbosa had all the necessary contacts. Moreover, he had a brother in France, who facilitated links with importers.

However, soon the French importers started to complain about varietal mixtures. Mr Mbosa realized that the bean growers did not use quality seed. Being a seed technologist by training, he started collecting seed from farmers in the region, purified and conditioned them and handed out about 25 tonnes of bean seed to farmers per year to ensure the delivery of a uniform product, required by the European market. Farmers sold their crop to Valy-Agri and returned one and a half times the amount of seed received.

The brother-in-law, Mr Liva, who was trained as an electro-mechanic, learned all about seed production and started training farmers. However, in 1996 (when the grain market price exceeded the price Valy-Agri had fixed for seed at the start of the season) most farmers failed to return the seed as per the contract, so Valy-Agri stopped working with them, except for a few committed farmers.



After contracts were not respected, Mr Liva (right) continued working with a handful of faithful bean seed growers, such as Daniel Rakotoniaina (left).

From the mid-1990s the French seed company Technisem contracted Valy-Agri to produce seed of French bean. Technisem already grew vegetable seed (mainly for the European market) in Antsirabe, at about 1500 m altitude, but needed more land to grow bean seed. The collaboration with Valy-Agri benefited both parties and was sustained for nearly a decade. Mr Liva began producing seed on his own land (about 7 hectares), but later lost this following the cyclone of 2004. Moreover, during the civil war in Côte d'Ivoire, Technisem stopped the collaboration. Ever since, Valy-Agri has produced seed for the domestic market with some faithful seed growers.

Apart from the French bean Nain Bobby, which has no string and a very good taste, whether cooked or eaten raw, the company also grows Royal Special. The bean Lingot Blanc has been a hit from the beginning. More recently the bean Marbré Rouge was added. The company has continued selling dried beans (Table 11.2). Until 2006, it bought from Andri-Ko maize, rice and groundnut seed, for which it had found a market.

Over the years Mr Mbosa established four enterprises: the seed enterprise Valy-Agri, a consultancy bureau, a communications company and a music business. Having all enterprises grouped made it impossible to know which one was truly profitable and which one not, and became a nightmare for the bookkeeper, so from 2009 all enterprises began operating independently. Mr Livo became director of the seed enterprise Valy Prod Sem.

11.2.2 Structure

Management. Mr Liva is director and the only member of staff, advised by Mr Mbosa, plus 50 to 100 temporary workers, as needed. Although the local market for bean seed has grown, Mr Liva's main objective is to move back into the export business.

Outgrowers. Although it started working with many outgrowers, in 2010 Valy Prod Sem worked with only one farmer group and two individual seed producers, covering about 30 hectares in three villages (Box 11.1).

Land. Seed is produced on farmers' land only. Daniel Rakotoniaina and his brothers have about 10 hectares of irrigated land and 28 hectares of land along the Mahajilo river, in Masiakampy village, a few kilometres from the main road to Mioandrivaso, which was tarred only in 2008. The land is flooded every year by the river, which deposits alluvial soil (locally called *baiboho*) and adds natural soil fertility. However, bush fires in the region have stripped the land of trees, resulting in serious problems

Table 11.2. Seed produced (tonnes), Valy Prod Sem.

	2004	2005	2006	2007	2008	2009
<i>French bean</i>	9	2	–	1	–	1
<i>Beans</i>	11	7	10	25	37	35
<i>Groundnut</i>	–	–	8	2	–	3
<i>Soybean</i>	–	–	–	3	5	–
<i>Total</i>	20	9	18	31	42	39
Dried beans for local consumption (tonnes)						
	20	30	30	30	30	30

Seed is quality declared, but not certified as fields were not inspected.

with erosion. When the river deposited sand on top of the fertile land, yields dropped from 1.8 tonne to 500 kg per hectare.

Infrastructure and equipment. In 1992, the company had two tractors and seeders, which they loaned to others. They sold them about 10 years later as their own seed farmers were reluctant to use the heavy machinery as it destroyed the structure of their soil. The company used to have its own truck, but given the poor conditions of the roads it broke down every year, so they sold it. The limited capacity of the enterprise most likely made it more profitable to outsource this service. Valy Prod Sem currently pays a 25-tonne truck to collect and haul the seed to the capital, about 240 km away, where it can clean and store 40 tonnes.

Quality control. All farmers have been trained in seed production. The production zone has so far been free of diseases and no fertilizers or pesticides are used in the fields, which are manually weeded.

Until recently the company only sent samples to the seed laboratory without having its fields inspected. Hence, seed is not certified. From 2010 onwards SOC will only analyse samples of inspected fields.

For the Lingot Blanc bean, producers keep their own seed every year. Valy Prod Sem gave them a cleaner-grader and a ventilator to clean their seed themselves. However, for the other varieties it supplies new seed every year. Valy Prod Sem treats its seed with K-Otrine (deltamethrin) against storage pests before putting it in 25 kg bags.

11.2.3 Cash flow

For 2 years Mr Liva took a bank loan of 25 million Ariary (\$12,500 at current rate, but worth about \$20,000 at the time) to collect seed for export. Once the importers had paid, generally within a month after they had received the container, he repaid the loan. Mr Liva has only used his and his wife's savings to invest in the company's assets.

11.2.4 Marketing

Having four linked businesses may have been hard on the bookkeeper, but it had its advantages. The Valy communication business distributed diaries (or appointment

Box 11.1 A mason turns to seed.

Daniel Rakotoniaina studied to be a mason, but he always had a passion for agriculture, so his lawyer uncle gave him land in Masiakampy.

Having bought a bag of bean seed in the capital Tana in 1986, Daniel multiplied it, but noticed that it did not give good results. So in 1990 he decided to start all over again. He went for training from SMV and bought 100 kg of Lingot Blanc bean seed from Bera-Agro, a French company.

One lady in his family worked for the seed multiplication centre in Sakay. She asked Daniel to monitor the on-farm varietal performance tests for maize and groundnut and taught him a few more things. At the end, Daniel kept some of the seed, which he multiplied for 5 years. But as he had no customers he gave up on it. His commitment and eagerness to produce quality seed came to Mr Liva's attention, so since 1996 he and his brothers have produced bean seed for Valy-Agri. As his reputation grew, Daniel took up maize seed production again in 2007, adding groundnut in 2009. His eldest son is at the university. 'He studies agriculture to do even better than me,' says Daniel, unable to hide his pride.

books) with a different agricultural theme each year. The diary contained adverts for the Valy seed business and targeted literate people. This made the company known to NGOs and projects, who have remained the principal clients ever since (Table 11.3), although the crisis in 2009 has reduced the number of NGOs working in the country. In 2007 Agro-Action Allemande still bought 100 tonnes for seed relief in the south and south-western regions.

Valy Prod Sem also has a sales depot at the seed multiplication centre (CMS – Centre de Multiplication de Semence) in Nanisana (in Antananarivo), which sells seed directly to farmers. Mr Liva did not want to make any future projections, as ‘politics determine the economy of our country’.

Table 11.3. Clients of Valy Prod Sem.

	1992	1999	2004	2009	2015 (predicted)
<i>Projects and NGOs</i>	1	1	1	1	–
<i>CMS Nansan</i>	–	3	3	2	–
<i>Export</i>	–	2	2	–	–

Ranking assessment by senior management of seed enterprise, 1 being the most important. For 2015 no projection was made as management felt the future of its business was entirely dependent on the political and economic situation.

11.3 Seed Multiplication Centre (CMS) – Sakay

11.3.1 History

The Seed Multiplication Centre (CMS) in Sakay, about 155 km west of the capital along the national highway number one, was the last one established among the 20 centres spread across the country. The CMS started as a project to promote maize in the mid-western region in 1990.

Five years later, after its first evaluation, the centre received a national mandate to produce maize seed for the entire country. In 1999, the maize project came to an end and the centre was obliged to finance itself. With the exception of the director, Mr Rafalimanana (Rafaly), who continued to receive his salary from the government, all staff had to be paid from the centre’s revenues.

The centre grows seed of maize (meva, IRAT 200, volasoa and NTS 10), groundnut, bambara nut (*Voandzeia subterranea*) and upland rice (B-22, 3737, 3728, FOF 154, Nerica 2 and Nerica 4) on its own land (Table 11.4). For seed of legumes and irrigated rice (X-265, X-243, 2067, MGK, Tsemaka and Sebota), CMS started collaborating with seed producer groups in 1992. Being mainly driven by project support, production with these groups was interrupted at times, but has continued ever since 2002. Soybean seed was produced once only in 2005. As some businessmen have recently established export markets for beans (Lingot Blanc) demand for seed is going up rapidly.

11.3.2 Structure

Management. It has been hard to fully self-finance the centre for the past 10 years, but the director Mr Rafaly remains positive and hopeful that things will change for

Table 11.4. Seed produced (tonnes), CMS – Sakay. Source: SOC and CMS Sakay.

	2004	2005	2006	2007	2008	2009
<i>Maize</i>	16 (1) ¹	80 (4)	60 (3)	50 (3)	70 (3)	85 (3)
<i>Rice (irrigated)</i>	20 (4)	50 (6)	20 (4)	60 (4)	80 (4)	26 (1)
<i>Rice (upland)</i>	25 (2)	45 (7)	18 (4)	42 (4)	40 (4)	105 (2)
<i>Groundnut</i>	2 (1)	2 (1)	2 (1)	2 (1)	2 (1)	2 (1)
<i>Other legumes</i>	2 (2)	10 (3)	6 (2)	4 (2)	5 (2)	6 (2)
<i>Total</i>	65 (10)	187 (21)	106 (14)	158	197	224 (9)

¹The number of varieties is given in parentheses.

the better. Until 1997, seed prices followed the same trend as those of petrol and fertilizer: 1 kg of seed cost as much as 1 litre of petrol or 1 kg of fertilizer. In 2010, a litre of petrol cost 2500 Ariary (\$1.25) and a kg of fertilizer 2000 Ariary (\$1), whereas certified rice seed cost only 1500 Ariary (\$0.75). To be sustainable, seed prices ought to go up. However, seed companies decide on seed pricing, but fear that farmers do not want to pay more for seed, particularly since the government keeps the price for paddy as low as 400 Ariary (\$0.20) per kg. Mr Rafaly believes that if seed prices had followed the same trend as fuel and fertilizer prices he would have been able to renew the centre's equipment, which is deteriorating after 20 years of service.

Apart from the director, there are 12 permanent staff and 60–80 temporaries during peak periods. Throughout the year about 8000 person-days of day labourers are paid.

Outgrowers. There are no outgrowers in the strict sense, but the centre supervises four farmer seed producer groups located in its direct vicinity. These groups produce irrigated rice seed, as well as seed of legumes such as bambara nut, groundnut and beans. They are given foundation seed that the centre sources from FOFIFA and are offered a good price to ensure that they sell back the seed they grow. Seed from these producer groups is sold through the same outlets as seed produced by the CMS.

Land. The centre has about 200 hectares of land. Since 1992, 10 hectares in Sakay have been used as showcases and demonstration plots along the national highway number one to show the new varieties along with new cultivation practices. Ten years later the Ministry of Agriculture copied this promotion strategy. The bulk of fields for seed production are in Imehy and Diavolana, but under current conditions the CMS has only been able to grow seed on 70 hectares.

Infrastructure and equipment. These are 20 years old and starting to deteriorate. The herbicide spray tank is crucial, since upland seed crops require timely weed control. The centre has its own generator and so is self-reliant in electricity, as in various other cases (e.g. Sections 10.2.2 and 11.3.2). The seed processing plant has a capacity of 10 tonnes per day. Seed growers who want to make use of it pay 120 Ariary (\$0.06) per kg seed.

Links and partnerships. The centre obtains its rice foundation seed from FOFIFA, but the CMS maintains its own maize foundation seed, for which Mr Rafaly was

trained. FOFIFA only provides maize foundation seed when there are project funds, so the CMS in Sakay cannot rely on them for maize.

The CMS is a member of AMPROSEM, but feels too little is done and that workers in the seed sector need to discuss more openly the problems faced by the sector. It believes that the lobbying work of the national rice platform, aimed at keeping down rice consumer prices, is counterproductive for the seed industry.

Quality control. Although the centre only produces seed for upland crops, it directly supervises the four farmer seed producer groups in its vicinity that also produce seed for irrigated rice. They receive foundation seed and are required to adhere to rigorous standards: line transplanting, as well as timely roguing, weeding and harvesting and proper drying. Farmer seed producer groups are motivated to produce quality seed by giving them a decent price, 800 Ariary (\$0.40) per kg, double the price of paddy. Processing and transport further add to the final seed price.

Quality control is done by the centre itself and follows the procedures for certified seed production, including the use of pure foundation seed, respecting isolation distances and proper roguing, weeding, drying and storage on wooden slats. Samples are only sent to SOC when clients require this. Even then, fields are not checked by official inspectors.

Mr Rafaly stresses that retailers need training to ensure seed quality is maintained during storage, whereas farmers need to be made aware of how to recognize certified seed to prevent retailers refilling seed bags with standard paddy.

11.3.3 Cash flow

‘We only give credit to those retailers that we know. They have to repay the first half after a month, and the second tranche after 2 months,’ explains Mr Rafaly. ‘To those we do not know, we do not give credit, but we give them a slightly lower price, so they feel motivated to buy from us.’

Given the political crisis and high interest rates, the centre has never considered taking a loan to upgrade its infrastructure and equipment. Since its herbicide sprayer broke down in 2009, it has bought spraying services from others. In return, CMS lends them its tractor and seeder.

11.3.4 Marketing

New varieties are advertised via agricultural fairs and occasionally also via the Radio National Malagasy (RNM) and TV clips. Since its early days CMS has had a shop in the capital, near the offices of the seed certification service. This shop became more important when the centre became financially self-sustaining in 1999 (Table 11.5).

More recently, orders are increasingly placed directly with the centre in Sakay by means of the mobile telephone or email. Projects and NGOs have remained important clients and often order seed at a negotiated price that includes the cost of transporting the seed to the desired destination. Governments only buy seed after disasters and during elections to win votes. However, they often only pay after 2 years, which ties up the centre’s operating capital (as is the case in Nigeria, Section 4.1.3).

The retailer network is still poorly developed, although retailers are important because of their proximity to farmers. Most retailer shops with whom CMS Sakay works are run by the farmers' association of the mid-western region, with whom it has developed a trust relationship over the last 20 years. In 2009, nine of their shops sold about 12–15 tonnes of maize and rice seed. Apart from these, CMS sold about 8 tonnes of seed through two agro-dealers in the capital. Retailers are important for maize and rice, but are unwilling to stock seed of legumes.

A major shift in marketing has been the introduction of small seed bags of 1, 2 or 3 kg. Although in Uganda this was mainly a response to overcome counterfeit seed sales and to make seed more accessible to smallholder farmers (Section 10.2.4), in Madagascar this mainly followed the adoption by farmers of new rice cropping technologies, such as transplanting, which requires less seed than broadcasting. With the system of rice intensification (SRI), farmers require only 6–7 kg of seed per hectare, so they want to buy even smaller quantities. Although pre-printed plastic bags could be ordered from a packaging company, the CMS buys rolls of plastic and heat seals its own bags to reduce costs. Apart from the small plastic packs, upland rice is also available in 10, 25 and 50 kg bags, whereas irrigated rice and maize seed is no longer sold in 50 kg bags.

About 50% of the clients are repeat customers who buy seed every year, but this proportion is generally higher for upland rice farmers than for irrigated rice farmers. In the warmer mid-west, upland rice is harvested during the hunger period, when the stock of irrigated rice is low. Upland rice farmers obtain higher prices and therefore sell most of their harvest and buy seed every year.

Projects are the main buyers of irrigated rice seed; sales dropped in 2009 when the political crisis meant that many donors stopped funding activities in Madagascar. Half of the rice seed produced had to be sold as paddy. For the CMS Sakay, seed sales of other crops were not affected by the crisis. Although it has been operational for 20 years and has been fully self-financing for the last 10, Mr Ravaly believes that the long-term sustainability of the seed centre is in danger if paddy prices are kept low.

Table 11.5. Clients of CMS – Sakay.

	1990	1999	2005	2009	2015 (predicted)
<i>Government</i>	–	4	4	1	4
<i>Projects and NGOs</i>	1	2	2	2	1
<i>CMS commercial shop</i>	2	1	1	3	2
<i>Individual farmers</i>	3	3	3	3	3
<i>Retailers in the region</i>	–	3	3	4	5
<i>Commercial maize growers (> 3000 ha)</i>	–	–	–	4	–
<i>Retailers in other regions</i>	–	4	4	5	6

Ranking assessment by senior management of seed enterprise, 1 being the most important.

11.4 SCAA

11.4.1 History

When Mr Andry Rakotovoao returned from France in 1985, where he studied mathematics, he started his own little business by collecting rice from farmers. Son of an agricultural engineer who worked for the research institute in the capital, he often spent his school holidays at his uncle's place near Lake Alaotra. His uncle owned a rice mill and a few trucks to collect rice from farmers. As a kid Andry often helped his uncle and dreamed of becoming just like him one day. Driven by a sense of self-determination Mr Andry bought his first small truck in 1987 and 3 years later he bought a rice mill.

In 1998 he embarked on rice production and established the Société Commerciale et Agricole d'Ambohimangakely (SCAA Ltd) to formalize his enterprise. Mr Andry never took a loan from a bank to invest in his business, but always relied on his own savings.

Over the years his transport company expanded to about 40 trucks. Mr Andry also established his own media company, as well as his own import-export company (only for rice), and became president of the national rice platform in 2005.

In 2009 Mr Andry started managing the run-down seed multiplication centre (CMS – Centre de Multiplication de Semence) in Anosiboribory, near Lake Alaotra, at an altitude of 700 m. He took over 100 of its permanent staff, along with 1000 temporaries. Some staff were made redundant, mainly to get rid of the civil servant mentality, and replaced by more dynamic and motivated staff. Strict budget plans were introduced to improve the financial status of the centre and Mr Andry brought in new suppliers for fuel and fertilizer. Within a year Mr Andry invested about \$400,000 to improve the Centre's infrastructure and equipment. Rice yields doubled from 2 to about 4 tonnes per hectare. In 2009 he produced 400 tonnes of certified rice seed, but he could sell only 100 tonnes. The rest he milled and sold as white rice.

A seasoned businessman, but a newcomer to the seed sector, Mr Andry learned two major lessons from his first year's experience. Apart from productivity, he will improve the quality of production, so that, in case he cannot sell all as seed, at least he will be able to sell it as luxury rice, sold at twice the price of ordinary white rice. He also plans to advertise the company's seed more aggressively and increase its distribution network from Antananarivo, Tamatave and Analamanga regions to all the rice-producing regions of the country. Since he has already



'Changing the mentality of civil servants after privatizing the state seed multiplication centres was a real challenge,' says Mr Andry, the director of SCAA.

established his own transport and media companies, he believes these will help him to achieve this goal.

Mr Andry has maintained close relations with the government and produces seed of crops and varieties requested by the Ministry of Agriculture. In 2011, he intends to multiply cassava cuttings and seed of maize, upland rice and soybean.

11.4.2 Structure

Management. The seed multiplication centre underwent a major change in management, shifting from a public servant style to an enterprise with rigorous budget plans and strict quality control (both technical and financial).

Staff. Apart from the director general, a director of operations and a director of administration and finance, there is a person in charge of the field operations and one in charge of the seed plant. The young guards are alert and wear fresh beige and red uniforms. The facelift of the seed processing plant only partially reflects the on-going, fundamental shift in attitude.

Outgrowers. SCAA does not work with outgrowers, but in 2009 it established a contract between the Direction Régionale de Développement Rural (DRDR) and various seed producer groups, who were given 100 hectares to produce seed. SCAA prepared the land for them while DRDR trained and supervised them. Although there are no reciprocal obligations, most of the seed is processed by SCAA for a fee, negotiated at the time of harvest.

Land. The centre has 559 hectares of irrigated land. With the lease contract, Mr Andry manages all of it, apart from 50 hectares that remain under government control, mainly to maintain the public status of the CMS. However, Mr Andry took over the management of the whole infrastructure, including the warehouse, so the government now has to negotiate the terms and conditions with SCAA to make use of it. In 2009, the government produced rice seed on only 25 hectares, as it had to learn how to work with the private sector.

Infrastructure and equipment. The warehouse can store up to 1000 tonnes of seed. SCAA took over all the old machinery, including the combine harvester, and bought three new Indian tractors, a generator and new computers for the office. The Japanese seed processing unit dates from the early 1990s and will soon be replaced by a smaller, modern unit. The seed plant and offices of SCAA are not linked to the power grid, but are powered by a generator.

Quality control. All fields and seed are officially inspected in order to obtain certified seed. From 2009 SCAA started hiring Mr Rakotobemalala, one of the five



Managing over 550 hectares of government-owned land to grow rice seed requires professionalism, flexibility and firmness.

inspectors working in the region at DRDR, who is close to retirement, as adviser. It had an immediate effect on the total number of fields approved for seed production.

11.4.3 Cash flow

Mr Andry borrows money from various banks for operations, but has never taken a loan for capital investment. For this, he relies on his own savings. However, he intends to take a loan in order to renew the seed processing equipment.

‘Combining seed with commercial rice production is a good strategy, as it helps to free up money more quickly,’ explains Mr Andry. The milled rice can be sold immediately after harvest, improving cash flow, while seed is stored for sale during the next season.

11.4.4 Marketing

SCAA produces seed of multiple rice varieties, although the bulk is the local variety *makalioka* (MK 34, which was released in 1934) and the more recent improved variety 4012 (*tsemaka*, which is a cross between MK 34 and 2787, a variety that tillers profusely). MK 34 has remained the most popular variety in the region. The long panicles have many ramifications, resulting in good yield. The slender grains swell well after cooking and have a well-appreciated taste. As consumers in the capital mainly ask for these varieties, the collectors mainly search for this rice when they drive their trucks over the 250 km long and difficult road, half of which is winding through the mountains, the other part being a degraded sandy road.

In 2009, SCAA sold 30 tonnes to the Ministry of Agriculture and 40 tonnes to farmers. The remaining 30 tonnes remained unsold and were milled and sold as white rice.

SCAA set up its retailer network around Lake Alaotra by relying on existing shops, either grocery shops, wholesalers or agro-dealer shops. Rice seed bags of 25 and 50 kg are clearly labelled and contain variety information. Posters with photos of the different rice varieties were produced and given to the shops willing to sell SCAA seed, along with flyers and brochures explaining certified seed and its benefits.

Understanding the importance of media, Mr Andry had various radio programmes made and broadcast by the local stations Amomix and Relax. He intends to strengthen further the seed marketing in the future.

11.5 Andri-Ko

11.5.1 History

During his service at the Ministry of Agriculture Mr William Andriamasinoro worked as a technician alongside rice researchers and for over a decade supervised activities of the country’s main seed multiplication centre at Anosiboribory, near Lake Alaotra.

He benefited from training courses and exchange visits to Morocco, Kenya and Australia. After working for 35 years, Mr William and his wife, who also worked as an agricultural technician, decided to take early retirement and establish a family enterprise. While his wife looks after the fruit tree nursery and flower production, Mr William cashed in on his skills and relations and set up a seed enterprise.

Lake Alaotra is Madagascar's primary rice production zone, with about 160,000 hectares of rice fields, half of which are irrigated by the river Maningory (and on which two rice crops are possible), so the prospect of producing and selling rice seed looked promising. In 2002 Mr William registered Andri-Ko as a cooperative, which in fact comprises 11 family members. Its premises are in Ambatondrazaka. A year later Andri-Ko produced 20 tonnes of seed of some popular upland rice varieties (2366, IRAT 134 and IRAT 112) that had been released by FOFIFA.

While increasing the seed production every year, grain prices kept on going down so farmers became more reluctant to renew their seed. Mr William quickly realized that he needed new varieties to stay in business. From the local varieties he began to select the most appreciated and performing ones that were not in FOFIFA's seed catalogue and started to clean and multiply them. By 2010, Mr William had established a collection of about 60 rice varieties, of which he intends to release only a few varieties every 3 years.

In 2007 Mr William followed the government's move to boost upland rice production and started producing Nerica 4 seed. Although it performed well and matured in only 90 days, he abandoned it because farmers who had first adopted the variety had lost interest after they learned that its taste was not fully appreciated and that it was hard to thresh. The people who threshed the Nerica 4 complained that its dust was very itchy. 'As far as I remember, rice varieties that are hard to thresh have never been adopted by farmers in Lake Alaotra,' says Mr William.

By 2006 he also started producing maize seed and in 2009 he sold 1 tonne of seed of legume crops (Table 11.6). These included vetch (*Vicia ervilia*, an ancient grain legume crop of the Mediterranean region), lablab bean (*Dolichos lablab*), cowpea (*Vigna unguiculata*) and some pois du Cap (*Phaseolus lunatus*, a white bean of Malagasy origin that is mainly grown in the south-western region of the country). All of these were basically grown as cover crops in between the maize and sorghum.

At one stage Mr William sold rice foundation seed to the FAO, who wanted to supply their newly trained farmer seed producers. It took a lot of effort to produce, and they bought only once. In future, he will refrain from producing and selling foundation seed.



Releasing a few new varieties every 3 years is part of Andri-Ko's strategy to stay in business. It also continues producing seed of the local variety *makalioka*, which performs well without mineral fertilizer.

Table 11.6. Certified seed produced (tonnes), Andri-Ko. Source: SOC and Andri-Ko.

	2005	2006	2007	2008	2009
<i>Rice (irrigated)</i>	50 (4) ¹	60 (6)	137 (11)	155 (18)	70 (9)
<i>Rice (upland)</i>	–	15 (3)	15 (3)	30 (3)	40 (3)
<i>Maize OPV</i>	–	25 (4)	25 (1)	–	50 (1)
<i>Sorghum</i>	–	–	–	–	20 (1)
<i>Groundnut</i>	–	18 (2)	–	–	–
<i>Beans</i>	–	–	–	–	1(1)
<i>Total</i>	50 (4)	118 (15)	177 (15)	185 (21)	181 (15)

¹The number of varieties is given in parentheses.

Although most technicians in Madagascar continue to aim at introducing short cycle rice varieties, Mr William does not share that vision. Over 70% of the farmers around Lake Alaotra continue to grow the local variety *makalioka* (MK 34). It is photosensitive, has a cycle of 180 days and yields 3.5–4 tonnes per hectare without mineral fertilizer.

During his time at CALA (Complexe Agricole du Lac Alaotra, a regional station of FOFIFA), Mr William acquired a sense of the need to develop new varieties. However, rather than replacing the popular varieties, such as MK 34, his main innovation strategy is to identify and promote new ones that are suitable for niche markets, such as for rice fields with poor water management (about 50,000 hectares around Lake Alaotra), or for newly exploited fields. With increased pressure to survive, fisherfolk have started growing rice on about 2000 hectares at the border of the lake (transplanting as the water in the lake recedes after the rainy season). Upland rice varieties adapted to a wide range of conditions and that perform equally well under irrigation, such as the Sebota varieties developed by French breeders in Brazil, have been added to Andri-Ko's varietal portfolio and will be the next ones the cooperative starts promoting.

The street part of the office has been refurbished as a mobile phone shop (named Andri-Com), showing the uncertainty of running a seed business in a difficult political and economic climate, as well as the adaptability of the overall family enterprise.

11.5.2 Structure

Management. The president is currently backed by his father, an accountant, a book-keeper and a secretary. There is one technician in charge of rain-fed crops and one for irrigated rice. Three staff members coordinate the work of the 100 labourers that are mobilized during peak periods, such as transplanting and harvesting. One person is in charge of the warehouses, along with a guard.

Infrastructure and equipment. Andri-Ko has two warehouses, each with a capacity of 50 tonnes. One is at the cooperative's headquarters, in the centre of town, while the other one is near the maize fields (maize is stored on the cob, until orders are placed). The cooperative owns a few rotary weeders and two Kubota moto-cultivators that are used for preparing the land, threshing the rice and transporting sand, firewood or people during the off season. They are also used to power the maize sheller. Apart from this, Andri-Ko has two winnowers, which at times farmer seed producer groups and other seed companies rent.

Land. Andri-Ko has 50 hectares, both upland and irrigated. It has some other family land, but this is not yet used for seed production. It is kept under permanent ground cover, using leguminous cover crops to protect the slopes against erosion.

Outgrowers. Loose agreements exist with five outgrowers who can grow at least 5 hectares of irrigated rice seed and who have their own storehouse. Andri-Ko offers 200 Ariary (\$0.10) per kg on top of the market price for paddy, but there are no reciprocal obligations. This flexibility suits both parties as there are too many uncertainties.

Links and partnerships. Andri-Ko is a member of the Malagasy Seed Producers Association AMPROSEM. Although Mr William has good relations with research, he exploits his own collection and varieties recently introduced from Brazil. Likewise, he has good relations with DRDR, but prefers to do as much as possible of the quality control himself, to keep costs down.

Quality control. The five outgrowers have been trained by Mr William, but are requested to organize and pay for their own seed certification. Andri-Ko only buys seed that has been certified. For seed production on their own land, Mr William and his son rigorously control quality in the field, backed by two supervisors. Andri-Ko pays for official certification by the seed inspector and performs its own seed germination tests before sending samples to the central laboratory at SOC in Tana.



Seed inspection and certification require training and firm follow-up.

Maize seed is always treated with either deltamethrin or sumithion against storage pests. When the stock is not sold within a few months, an additional fumigation with phosphine may be done. Rice seed is only treated if requested by the client.

11.5.3 Cash flow

Mr William never took a loan. According to him 'micro-credit institutions are often portrayed as helpers of the poor, but many farmers have gone bankrupt because of them. Interest rates are just far too high. It is authorized theft.'

Andri-Ko sells rice seed at 1400 Ariary (\$0.70) per kg, which gives it a narrow profit margin. It sells upon cash payment and does not provide credit for its clients.

If needed, Andri-Ko mobilizes capital from its 11 (family) members. In 2009 the FAO contracted Andri-Ko to deliver 20 tonnes of sorghum seed (IRAT 204) to the southern part of the country; Mr William's family had to mobilize 12 million Ariary (\$6000), or 600 Ariary (\$0.30) for each kilogram of sorghum seed.

11.5.4 Marketing

Mr William wanted quality seed to be available to the farmers, so from the very beginning he established links with 14 agro-dealer shops in all major centres around the lake. As most shopkeepers cheated or disappeared with the seed stocks or agrochemicals and even with the cash, only two remained operational after 2008. Their importance as markets for Andri-Ko has drastically fallen (Table 11.7).

Individual farmers have kept on visiting the cooperative's two warehouses to purchase seed. Although seed is generally sold in 50 kg bags, Mr William admits that very few rice farmers buy such large quantities nowadays, partly because the landholdings have reduced in size and partly because broadcasting has been replaced by transplanting (widely promoted by government and NGOs and which requires about five times less seed). At the cooperative, bags are readily opened to sell farmers the quantities they desire, mostly 5–10 kg.

In 2006 the NGOs CARE International and the Catholic Relief Services (CRS) placed large seed orders to supply the cyclone-affected areas, while in 2007 the FAO also became a client.

Mr William targets selling seed of new varieties that he wants to release every 3 years. For this he is working closely with Dr Seguy, one of the three researchers (Seguy, Bouzinac and Taillebois) who developed the Sebota varieties in Brazil.

He obtained a contract from the BV Lac project (Projet de Protection des Bassins Versants du Lac Alaotra) to produce 500 kg of seed in small packs of 250 g. The project had already tried out such test kits for sorghum and cover crops and now wanted to try it for rice. Mr William believes that, when farmers have tried it on 100 square metres by following the advice given on the accompanying technical leaflet, they will come back to him the year after to buy larger quantities of seed of these new varieties.

Although Mr William did not want to anticipate how the future of their family seed business would turn out and who would be the main clients in 2015, he remains hopeful; he even handed over the presidency of the cooperative to his son Laingo.

Table 11.7. Clients of Andri-Ko.

	2003	2009	2015 (predicted)
<i>International relief agencies</i>	–	1	–
<i>Individual farmers</i>	2	2	–
<i>Agro-dealers</i>	1	3	–

Ranking assessment by senior management of seed enterprise, 1 being the most important. For 2015 no projection was made as management felt the future of its business was entirely dependent on the political and economic situation.

11.6 FIFAMANOR

11.6.1 History

FIFAMANOR is a centre for rural development and applied research created in 1972 from a convention between the Malagasy and Norwegian governments. Evolved from a project, FIFAMANOR became a public utility company with financial and administrative autonomy (EPIC – établissement public à caractère industriel et commercial) in 1992. The Malagasy government pays the salaries of all staff. The Norwegian government contributed to the centre's core funds, based on 5-year plans, but suspended its support in 2009, following the political crisis in Madagascar.

Most of the investments, including the laboratories, screen houses, warehouses and offices, are from Norway. The French Development Agency (AFD - Agence Française de Développement) donated a combine harvester in 1997. In 2007, the PSDR project (Projet de Soutien au Développement Rural) built another potato warehouse.

The centre coordinates research, production, diffusion and marketing of potato, wheat and other cereals, sweet potato, forage and milk production. FIFAMANOR has evaluated potato, wheat and forage varieties in different agro-ecologies for over 20 years.

Seed production has remained relatively stable, although various factors affected seed production in 2009 (Table 11.8). Bacterial wilt became such a problem that new fields had to be sought. During the political crisis, grain prices for maize and soybean became higher than FIFAMANOR's price for maize and soybean seed, so the seed produced on-station was used as animal feed.

Seed of four upland rice varieties are grown on-station, namely FOFIFA 159, FOFIFA 161, FOFIFA 172 and *chom rong dhan* (a Nepali variety). However, as upland rice in the central highlands is harvested at the same time as irrigated rice, it does not command a higher price (as is the case in the mid-western region (Section 11.3.4)) and so relatively few farmers are interested in buying seed. So, although

Table 11.8. Seed produced (tonnes), FIFAMANOR. Source: FIFAMANOR.

	2005	2006	2007	2008	2009
<i>Potato foundation seed</i>	66 (7) ¹	22 (5)	45 (5)	26 (7)	11 (4)
<i>Potato</i>	181 (2)	147 (2)	114 (2)	197 (3)	63 (2)
<i>Soybean</i>	5 (3)	22 (6)	12 (2)	20 (2)	–
<i>Maize OPV</i>	16 (2)	34 (2)	7 (2)	5 (3)	–
<i>Wheat and triticale</i>	6 (2)	10 (2)	8 (4)	30 (4)	3 (4)
<i>Rice (upland)</i>	1 (4)	6 (4)	7 (2)	18 (3)	13 (2)
<i>Total</i>	275 (21)	241 (21)	193 (17)	296 (22)	90 (12)

¹The number of varieties is given in parentheses. Data do not include seed of forage species.

upland rice production increased under the past government's agricultural policy, only part of the seed produced could be sold.

11.6.2 Structure

Management and staff. There are five departments: for research, production, extension, marketing, and administration and finance. Of the 139 staff, 13 are public servants.

The research department is in charge of breeder and foundation seed production of potato, sweet potato, wheat and triticale. For potato seed multiplication, FIFAMANOR uses its high altitude station (2400m). For sweet potato, the case is different because it is difficult to store vines. The research department multiplies vines in farmers' plots in Mandoto, Betafo and Manandona, and in some parts of Vakinankaratra, where frost is very scarce (Box 11.2). The extension department has nurseries and demonstration plots in different parts of Vakinankaratra. Farmers take care of the plots and sell the vines.

The extension department is the largest, with 47 staff. These include a network of 29 extension agents who live in the rural areas and who maintain close relations with farmer seed producer groups. Agents meet at the centre once each month. The marketing department has a stock keeper and a person in charge of selling seed, milk and dairy products.

Outgrowers. For years FIFAMANOR worked systematically with farmer seed producer groups, but when market prices went up farmers sold their seed on the market rather than to them. Hence, it stopped using production contracts for upland rice in 2000 and for potato in 2006. Seed growers now buy foundation seed from FIFAMANOR and can sell to anyone. The centre buys seed from these groups based on demand only.

Box 11.2 Sweet potato vine growers.

'A few months ago our vegetables were photographed and now we have a contract to produce seed,' says Mr Seth Rakotondrazafy, surrounded by other farmers from Andranomanelatra village. The association to which he belongs has grown from strength to strength in recent years.

Madagascar's central highlands are famous for potato, sweet potato and vegetables. However, winters in Antsirabe, at 1600 metres altitude, regularly bring frosty nights, making the production of sweet potato vines nearly impossible.

But, in 2004, researchers from FIFAMANOR identified the nearby village where farmers were growing sweet potato on the warmer south flank of a hill. Farmers also made clever use of the waste water discharged by the TIKO milk processing factory to irrigate their fields.

Visiting their fields 6 years later, members of the MaitSORIRININA association (meaning 'green, even in winter') proudly tell us they had already sold 20 tonnes of vines to the Ministry of Agriculture, via FIFAMANOR. They needed about 1 hectare, using three rounds of cuttings, following what they learnt from FIFAMANOR. They shifted to short cycle varieties that are high in demand: two orange-fleshed ones (*bora* and *mendrika*) and a white-fleshed one (*naveto*).

(Continued)

Box 11.2 (Continued).

In fact, the association's members are all family who cultivate their own land. The three women and five men mainly share crop production and market information with each other, and jointly decide on growing those varieties that are most desired that season. And they join forces when buyers from Tamatave or Tana (Antananarivo) visit them to buy in bulk.

Mr Seth, president of the association, tells us how all members take pride in growing crops. For their vegetable production they always buy seed from Semana that were conditioned and packaged in France. 'A few months ago we hauled our vegetables to the nearby market, where someone photographed them. He was impressed by the quality of our produce, enquired about our fields and took my mobile number. A few weeks later he called me, saying he worked for the seed multiplication centre (CMS) in Laniera, not too far from the capital, and asking to visit our fields,' recalls Seth. 'He asked the association to grow seed of *petsai*, a Chinese cabbage.' The membership grew to 14 and a contract was established stipulating they will receive 3000 Ariary (\$1.50) per *kapoaka* (a tin of condensed milk). Not sure if the contract will be profitable, they allocated a third of a hectare to this crop after having received source seed and training from the CMS Laniera.

The CMS staff has already informed them that next year they want to contract them to grow seed of cucumbers and courgettes, as part of a project with the World Vegetable Center (AVRDC). How a digital photograph can change people's lives!

Due to increasing problems with bacterial wilt, however, the centre is obliged to grow seed on fields that have no such disease history and as such has resumed production contracts with seed producer groups, albeit under very strict monitoring, assured by its network of extension agents.

Land. Of the 570 hectares spread over three stations, about 350 are cultivated, the rest being taken up by buildings or left fallow for potato seed production. No rent is paid to use the land, as the centre is still considered a public service.

Infrastructure and equipment. FIFAMANOR has well-kept offices, laboratories, screen houses, a seed conditioning unit and warehouses. While working with outgrowers, FIFAMANOR installed five potato and two cereal stores in rural areas. Since it stopped working with outgrowers, some of these have been used by cooperatives.

Links and partnerships. The centre collaborates with national (FOFIFA) and international centres, such as CIP and CIMMYT, from which it obtains lines (wheat) and clones (potato and sweet potato) to be tested and multiplied in Madagascar. The research department assists in the development of the national variety catalogue. FIFAMANOR is a member of FIOVA, the association of enterprises of the Vakinankaratra region, which organizes regular fairs.

Quality control. None of the seed produced by FIFAMANOR is certified by SOC, but this will change from 2011 onwards when the national seed catalogue is ready and more stringent official control procedures are in place. However, for potato, SOC doesn't have the facility to test for diseases, which is necessary for potato certification.

Potato and sweet potato plantlets grown *in vitro* in the laboratory are transferred to sterilized substrate in insect-proof screen houses to ensure healthy seed

production. Samples are tested for viruses using the ELISA test (enzyme-linked immunosorbent assay) before potato seed is sold. Another big asset for the centre is its high altitude station in Tsiafajavona (2000 m), especially for potato breeder seed production. At this altitude very few aphids occur; aphids may transfer viruses.

For grain and forage crops, FIFAMANOR has its own quality control laboratory to test moisture content, germination rate and specific and varietal purity.



In vitro cultivation of potato and sweet potato is a first step to producing healthy plantlets.

11.6.3 Cash flow

Although salaries are paid by the government and infrastructure has been mainly obtained through donor support, the centre aims at becoming financially more independent.

Through its good links with research, foundation seed is either produced on-farm (for potato, sweet potato and wheat) or sourced from FOFIFA for the other crops.

Seed prices have remained relatively stable over the past 5 years, with fluctuations mainly caused by the unpredictable annual decision of the Ministry of Finance to consider seed as any other good and raise a 20% value added tax (VAT) on it.

Until 2006, FIFAMANOR contracted numerous farmer groups to grow potato seed, to whom they gave foundation seed on credit, but it almost entirely stopped doing that after contracts were not respected.

Potato foundation seed is sold at 1200 Ariary (\$0.60), whereas seed potato is sold at 1000 Ariary (\$0.50). One kilogram of sweet potato vines costs 440 Ariary (\$0.22).

11.6.4 Marketing

Clients for potato seed are mainly projects and NGOs, farmer associations and seed producer groups (Table 11.9). The system of contracting farmer associations to sell seed

Table 11.9. Clients of FIFAMANOR.

	1995	2000	2006	2009	2015 (predicted)
<i>Projects and NGOs</i>	1	1	1	1	2
<i>Independent seed producer groups</i>	–	–	–	2	1
<i>Farmer associations</i>	3	3	3	2	1
<i>Individual farmers</i>	4	4	4	3	3
<i>Contractual seed producer groups</i>	2	2	2	–	–

Ranking assessment by senior management of seed enterprise, 1 being the most important. As different crops have different clients, the exercise was done for potato seed only.

of potato and other crops helps to improve farmers' access: any farmer group can sign a contract with FIFAMANOR, pay 10% of the (favourable wholesale) price upon receipt and the rest a month later.

New varieties are promoted via FIFAMANOR's network of extension agents, who set up demonstration plots and nurseries in the villages where they work and live. Also, agricultural fairs and the national radio (RNM) are used, but for seed sales it generally does not work with the radio unless it faces problems selling.

11.7 Meva Seed Potato Growers' Cooperative

11.7.1 History

Androkavato, about 17km north-west of Antsirabe along an eroded and winding road beside terraced fields, is one of the villages that is blessed with a good climate at 1600 m altitude, fertile volcanic soils and a year-round water supply from a nearby source, which allow its farmers to grow three crops a year. Ten trucks a day come to buy ware potato, wheat, maize, carrots, cabbages, beans and a range of fruits, such as peach, pear, persimmon (*Diospyros kaki*) and *bibassier* (*Eriobotrya japonica* or Japanese plum).

Although some individuals were already producing potato seed in the 1980s, in 1991 seven farmers decided to form a seed producers' association. In 2003 they decided to register the Meva cooperative, as this allowed them to share any profit made between its members. They cleverly kept their association, as projects often give associations access to subsidized fertilizers. The membership had grown to 29, including seven women, all of whom contributed to paying the 100,000 Ariary (\$50) registration fee of the cooperative. They then joined a union of 18 seed producer cooperatives in Vakinankaratra (VKMMV).

Already in the 1980s FIFAMANOR supplied them with foundation seed of popular potato varieties, the last one being *meva* (meaning nice, because of its pink flowers and prolific production), from which the cooperative borrowed its name. They used two of the potato stores established by FIFAMANOR with a capacity of 20 and 30 tonnes. In 1994, a third store was established with 30% of the costs borne by the association. The business expanded and its profit was used to build a fourth store with a capacity of 10

tonnes in 2003. Three years later, as their reputation in the region grew, they built a small shop for the sale of seed, fertilizers and pesticides (Table 11.10). The members elected two people to look after the shop. Half of the profit of the sales is for them, the other half for the cooperative.

Over the years, 18 potato varieties have been evaluated

Table 11.10. Seed produced (tonnes), Meva cooperative.

	2005	2006	2007	2008	2009
<i>Potato</i>	64	173	24 ¹	23	8
Sales of agricultural inputs					
<i>Fertilizer (tonnes)</i>	1	27	10	4	8
<i>Insecticides (l)</i>	27	23	11	22	24
<i>Fungicides (kg)</i>	69	33	44	258	242

¹Seed production contracts with FIFAMANOR ended.

in the demonstration plot set up by the FIFAMANOR extension agent. The cooperative retained five varieties of which it produces seed as well as ware potatoes. Farmers generally prefer varieties that keep well, which is another reason why *meva* is still the most popular one. They also grow seed of *marevaka*, which gives smooth and oblong tubers that are well appreciated by the urban market because it lends itself well to making chipped potatoes (French fries) and mashed potatoes. Ware potatoes of *marevaka* sell at a higher price than those of *meva*, but they are more sensitive to diseases. Other varieties grown include *diamondra*, *maharevo* (tubers of which have a similar diamond shape, but a pinker skin) and *marotia* (meaning loved by many). By 2007 they produced about 100 tonnes of potato seed on about 4 hectares and they have always easily sold all of their seed.

More recently, however, problems with bacterial wilt have meant that the cooperative could get only part of the foundation seed they used to buy. As they started to multiply their own seed, yields went down by more than 60%, so they realized the importance of renewing their foundation seed annually, if only they could. Customers became sad that the cooperative hardly sold any more seed, and so they started buying any seed they could find.

The cooperative also grows oat seed, but was unable to sell it all in 2009. Oat seed is mainly bought by dairy producers, but as these are mainly located near Antsirabe sales are not as easy as dairy farmers are reluctant to travel the 16km of eroded road to the cooperative. 'Growing potato seed is demanding, but we are much surer that we will sell it all as we live in a potato growing zone,' says Zanalisoa Rasoanarivo. Apart from being one of the two people in charge of the shop, she is also treasurer of the association, union and cooperative.

Members of the cooperative have a passion for agriculture. To cope with recent changes in the potato seed sector, various members recently signed a contract with Malto to grow barley, which the company uses to produce malt for the Star brewery in Antsirabe (Box 11.3). Although members can grow any crop, they continue hoping that FIFAMANOR can solve the problem of access to potato foundation seed, as that is what the cooperative likes most and for which they have built a reputation.

11.7.2 Structure

Management. The cooperative has a president, a vice president, an adviser and a treasurer. Members started growing potato seed for FIFAMANOR, first as individuals and later on through contractual agreements whereby prices were fixed in advance and whereby foundation seed was provided on credit. Since 2006 they no longer work with such contracts. They buy their foundation seed from FIFAMANOR and sell to whoever is interested.

Land. The cooperative has no common land. All members grow seed on their own fields and profit is shared according to each member's contribution.

Infrastructure and equipment. The two potato stores and shop belong to the cooperative, whereas the two other stores belong to FIFAMANOR. All members have their individual equipment, including a knapsack sprayer.

Quality control. The treasurer's husband, Mr Dieudonné Randriamananjara, is an extension agent of FIFAMANOR who lives in the village. Although he has to oversee

activities in three communes, he taught them a lot about quality seed production.

11.7.3 Cash flow

Members never took credit to produce seed potato. For the foundation seed the cooperative pays to FIFAMANOR 1200 Ariary (\$0.60) per kg. While ware potato is sold at 600 Ariary (\$0.30) per kg, the Meva cooperative sells its potato seed at 1200 Ariary (\$0.60) per kg, irrespective of the client or the amount bought. This makes their quality seed just as expensive as FIFAMANOR's foundation seed.

11.7.4 Marketing

No advertising is done. The reputation of the Meva cooperative has spread through word of mouth only. Farmers are the key customers (Table 11.11). Potato seed is sold to individual farmers, coming from the village, neighbouring communes or even as far as Betafo, 37 km away. Quantities bought vary between 300 kg and 1 tonne (about 2 tonnes of seed are needed per hectare). NGOs and projects often place orders over the phone, but are less important and less predictable than direct sales to farmers.

Most clients return every season to buy seed, although the rate of return customers varies between seasons. Potato produced during the intermediary season (January/February to May/June) fetches a higher price, so 100% of the clients come and buy seed every year in

Box 11.3 Barley for the brewery.

Every year, the Malto factory turns about 4000 tonnes of barley into malt to supply the Star brewery in Antsirabe. For this, it works with 7200 farmers who grow barley in wintertime, in between two rice seasons. Malto used to establish contracts with roughly 500 farmer groups. The Meva cooperative was one of them. In order to avoid problems with group liability, Malto acted on farmers' own preference and now makes contracts with 6500 individuals and 225 groups, of on average three to four farmers. This seriously increased the repayment rate.

Malto provides its barley growers with quality seed, fertilizers, pesticides and technical advice through its 27 extension agents. Every year it needs 200 tonnes of seed. After having tested barley seed introduced from Tanzania and South Africa for their performance and brewing quality, four varieties were retained. These are multiplied by 250 trained seed growers, who receive 20 Ariary (\$0.01) above the grain price. The seed is processed by Malto and distributed to its growers the year after.

As farms in the highlands near Antsirabe are small, the logistics are enormous. During harvest, Malto goes from farm to farm with a truck and a bus with 50 workers who weigh and bag the grain. The team is even fed by a caterer to increase efficiency. 'For two months and a half, we have a mobile factory,' says Daniel Couderc, director of Malto. Working with smallholders certainly has its challenges.

Table 11.11. Clients of Meva cooperative.

	1995	2000	2006	2009	2015 (predicted)
<i>Individual farmers</i>	1	1	1	1	1
<i>Projects and NGOs</i>	2	2	2	2	2
<i>Farmer associations</i>	4	4	3	3	3
<i>FIFAMANOR</i>	3	3	–	–	–

Ranking assessment by senior management of seed enterprise, 1 being the most important. As different crops have different clients, the exercise was only done for potato seed.

January. As production is much higher in the rainy season (October/November–February/March) and in the dry season (June/July–November/December), prices then are lower than in the intermediary season. Some of the customers who grow potato during these seasons recycle their seed, and so only about 40% are repeat customers at that time.

11.8 Challenges and Strengths of the Seed Enterprises

The 2008 global food crisis seemingly had little effect on Madagascar, which had anticipated the crisis and started to boost its domestic production to make the country self-sufficient in rice. But, while policies favoured stable rice prices, the cost of mineral fertilizers and fuel went up. Seed producers, reluctant to increase their seed price out of fear that farmers will stop buying altogether, saw their profits dwindle.

More disturbing has been the political crisis that started in February 2009 (and that had not been resolved at the time of writing this chapter in July 2010): companies closed down, the tourism industry collapsed, most bilateral aid was frozen, development organizations withdrew, and people's (already low) purchasing power dropped further. With projects and NGOs often being their principal clients, various enterprises have had problems selling some of their seed.

Madagascar faces frequent natural disasters on the one hand but has diverse agroecological zones where seed and crops for relief aid could be produced if the strong interest groups favouring rice imports could be managed.

On various occasions the authors were told that staff was given part of the locally produced rice seed to eat because it could not be sold, while other regions faced a shortage. Multi-stakeholder platforms could play a role in assessing seed demand and supply in a more systematic and transparent manner.

Seed relief agencies buy the cheapest seed on the market, in large amounts with little emphasis on quality. Until now, the legislation has not affected seed production and distribution. Even though the law forbids the sale of uncertified seed, companies only certify when customers ask for it. To raise seed quality, in 2010 the Ministry of Agriculture decided that the national laboratory would no longer test samples that are not from inspected fields. Most enterprises see this as a positive development which will reduce unfair competition.

Although most enterprises plan to extend their selling points, all act in isolation. Likewise, many projects have trained seed producer groups and strengthened their marketing skills, bypassing existing small traders and retailers with their long-established knowledge, skills and relations. Improving ties with other market actors, instead of trying to exclude them, would benefit seed producers and end-users just as in other value chain developments (e.g. Devaux *et al.*, 2010).

Although Fafchamps and Minten (1999) stated that most agricultural transactions in Madagascar take place without orders and without credit, many seed enterprises do take orders from projects, NGOs, farmer groups and at times even individuals. Few enterprises borrow money, but many sell seed on credit, although rarely to individuals.

The introduction of micro-finance institutions has raised many expectations (Dunford, 2009), but, with a 36% interest rate and the need for clients to present proof of identity (something poor people rarely have), Malagasy farmers often turn

to local moneylenders whom they know. ‘Many traditional social institutions exist, but we have always ignored them and tried to establish new economic ones, such as cooperatives, which often collapse once projects end. Seed distribution and marketing may benefit a lot by building on existing local institutions,’ says Philibert Rakotoson, secretary general at the Ministry of Agriculture.

Apart from SCAA, the sweet potato growers’ association and the Meva cooperative, all the enterprises described above were managed by (former) government people with long experience in seed. All enterprises showed adaptive management by diversifying their activities, often combining seed with crop production to speed up cash flow, and some enterprises started selling small seed packs to increase their outreach to farmers.

Despite the unstable political climate and unfavourable grain market and relief aid politics, many Malagasy seed entrepreneurs have managed to survive. Improving business support services and communication between all actors in the seed sector will be crucial to ensuring that the masses of poor people reap the benefits of quality seed.

References

- Devaux, A., Andrade-Piedra, J., Horton, D., Ordinola, M., Thiele, G., Thomann, A. and Velasco, C. (2010) *Brokering Innovation for Sustainable Development: the Papa Andina Case*. ILAC Working Paper 12. Institutional Learning and Change Initiative, Rome.
- Dorosh, P.A. (2008) Food price stabilisation and food security: international experience. *Bulletin of Indonesian Economic Studies* 44(1), 93–114.
- Dunford, C. (2009) Credit unions and rural banks reaching down and out to the rural poor through group-based microfinance. *Enterprise Development and Microfinance* 20(2), 107–124.
- Fafchamps, M. and Minten, B. (1999) Relationships and traders in Madagascar. *Journal of Development Studies* 35(6), 1–35.
- IMF (2009) *Republic of Madagascar: Poverty Reduction Strategy Paper – Annual Progress Report*. International Monetary Fund, Washington.
- MAEP (2007) *Recensement de l’Agriculture: Campagne 2004–2005, Tome III: Parcelles et Superficies des Cultures*. Ministère de l’Agriculture, de l’Élevage et de la Pêche, Antananarivo. http://harvestchoice.org/maps-etc/Madagascar_2005_Vol%203.pdf.
- MAEP (2008) *Document de Stratégie Nationale Semencière*. Ministère de l’Agriculture, de l’Élevage et de la Pêche, Antananarivo.
- MEI (2010) *Evaluation de la Filière Riz à Madagascar*. Ministère de l’Économie et de l’Industrie, Antananarivo.
- Minten, B. and Barrett, C.B. (2008) Agricultural technology, productivity, and poverty in Madagascar. *World Development* 36(5), 797–822.
- Minten, B., Dorosh, P., Dabat, M.-H., Jenn-Treyer, O., Magnay, J. and Razafintsalama, Z. (2006) *Rice Markets in Madagascar in Disarray: Policy Options for Increased Efficiency and Price Stabilization*. World Bank Africa Region Working Paper Series No. 101. World Bank, Washington.