



Kulima ndi Malonda (Farming as a Business)

A private sector-led approach to agricultural extension



Contents

1. The rationale for Kulima Ndi Malonda (KnM)	1
2. KnM in detail	2
3. Experiences from the KnM pilot phase	5
3.1 Lessons learned and recommendations for future implementers of KnM	5
1. Design of the extension programme	6
2. Revision and adaptation of training materials (crop- / value chain specific)	7
3. Recruitment and training of field technicians (including educational and skills requirements)	8
3a. Qualifications and Certification of KnM trainers	9
4. Registration of farmers (including criteria)	10
5. Selection of lead farmers (including criteria)	10
6. Training of lead farmers	11
7. Design and establishment of demo plots	11
8. Design and implementation of the M&E system (including reporting)	12
9. Organisation of the farmer training (including logistics and materials)	14
10: Gender and youth	14
3.2 Drivers and barriers to adoption	15
4. Cost and benefits	16
4.1 Implementation costs for the company	16
4.2 Return on investment	16
4.3 The cost-benefit model	17
5. Further development	19
5.1 Non-chemical inputs (agroecology)	19
5.2 Master training facility	19
5.3 Promotion and upscaling	20



The rationale for Kulima Ndi Malonda (KnM)

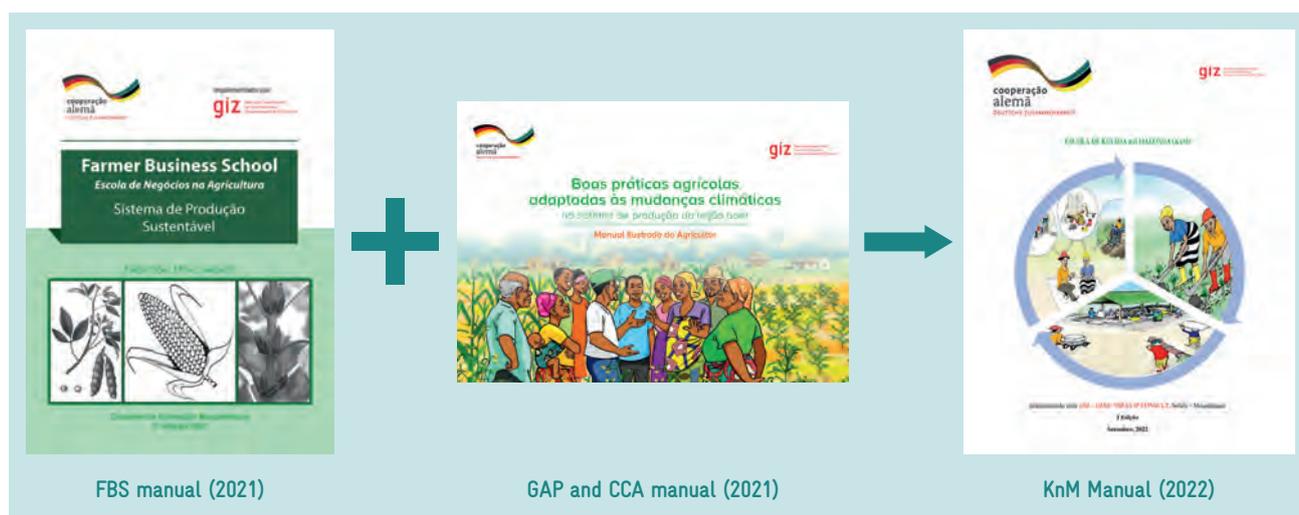
Despite considerable investment and effort over the last 50 years to build the capacity of Mozambican smallholder farmers, results have been mixed at best. Many interventions have been once-off without securing farmer access to input and output markets. Kulima ndi Malonda (KnM) is a training approach that aims to improve upon two training programmes – farmer business school (FBS) and good agricultural practices (GAP). The GAP component includes climate change adaptation (CCA) measures. KnM is based on the acknowledgement of the importance of business and technical agricultural training to smallholder farmers to enable them to better manage their farms and thus increase their yields and incomes. But it also recognises the need to make training economically feasible for private sector implementing companies, whose core business is making a profit. Thus the provision of extension activities is feasible only if there is a strong cost-benefit to their efforts in training smallholder farmers in their network.





2.

KnM in detail



FBS is a comprehensive adult learning approach that targets changing the mindset of smallholder farmers by sensitising them to market opportunities and the possibilities to improve productivity, family income, and nutrition. The core of its modules is income-oriented, decision-making based on a cost-benefit analysis of different technol-

ogies for a main crop and two other food or cash crops, combined with strategy development to diversify income. Facilitators who are certified FBS trainers run the trainings in an intensive format over five consecutive days, five hours per training. Before starting FBS trainings, these facilitators have themselves undergone an inten-

sive Training of Trainers (ToT), consisting of two weeks theoretical training and two weeks practical training, implemented by an FBS master trainer.

GAP training is given throughout the agricultural season in two-week intervals to farmer groups of 20-40 participants. After a brief introduction of the respective topic of the session, the groups practice hands-on what they have

learned in demonstration plots. The farmers themselves prepare and cultivate the demo plot and sell the produce after harvest. Facilitators are usually lead farmers, supported by FBS trainers.

KnM combines the two approaches into one training programme that covers the contents of FBS, GAP and CCA into one cohesive capacity building process, as set out in table 1.

TABLE 1. KnM MODULAR PROCESS					
FBS manual (2021)	Duration	Session	Total # of sessions	Timing	
M.1: Planning	9 hours	1	3	Before the launch of the agricultural season	
Production schedule (in class and homework)	90 minutes				
Producer booklet	90 minutes				
Measurement of the demo plot - parcelling (demo plot)	3 hours	2			
Agricultural credit (inputs and services)	90 minutes	3			
Gross margin (in class, and homework)	90 minutes				
M.2: GAP (Good agricultural practices)	18 hours	1	6	At the beginning of the agricultural season	
Climate change - Causes and effects - Mitigation (protection of natural resources - Soil and water conservation - Resilience (CCA)	3 hours				
Land preparation (demo plot practical) - Cleaning and sustainable tillage	3 hours	2			
Vegetation management) - Establishing lines - Digging of holes & furrows - Sowing (density) - Fertilisation	3 hours	3		At the beginning of the growing season and during the vegetative period	
- Thinning and re-sowing	3 hours	4			
- Pest scouting (pests, diseases, and weeds) - Pest control	3 hours	5		Immediately after germination	
Harvest and post-harvest - Harvesting method - Drying - Quality control (cleaning & selection) - Warehouse preparation - Bagging & storage - Aggregation	3 hours	6		During the growing season	
				Before and during harvest	
M. 3. Nutrition and food security	3 hours	1		1	Before harvest
- Family budget - Balanced/sufficient food & drinking water	3 hours				
M. 4. Commercialisation	3 hours	1	1	Before harvest	
- Associativismo - Marketing - Saving	3 hours				

Beyond the merging of content of FBS and GAP, KnM has the following key **differences / advantages**:



Theory and practice are taught concurrently during the agricultural season to increase retention of content and adoption of best practices.



Teaching is peer-based with lead farmers taking on the role of instructors and the private sector company's technical staff overseeing the process, greatly reducing the number of staff required to conduct trainings.



Content is designed to be highly visual to facilitate both the lead farmer's teaching and the (often illiterate) smallholder farmers' understanding.



The capacity building is done by companies that have a vested interest in seeing their farmers grow and prosper, creating a win-win opportunity for all.



Training during two or three seasons and continuous presence in the area will ensure a lasting impact of the capacity building, turning small farmers into agropreneurs.



Establishing long-term relations based on repeat transactions will build trust and goodwill to grow the company and the farmers in its network, a precondition for sustainable growth.



This will provide the basis of trust needed for the provision of inputs on credit and possibly agro-input insurance once farmers are ready for it.



Servicing a network of creditworthy small farmers will likewise improve the company's own creditworthiness.





3.

Experiences from the KnM pilot phase

3.1 Lessons learned and recommendations for future implementers of KnM

Kulima ndi Malonda was piloted with two private companies that had previously implemented GAP and FBS trainings in the context of the GIZ project Green Innovation Centres for the Agriculture and Food Sector (GIAE): Luteari Insumos e Serviços Agrícolas and Técnica Agro-Negócios (TA) in Sofala and Manica provinces of central Mozambique. Both these companies are in the business of sales of inputs and aggregation of final produce for sale. The GIAE project contracted the company Rutasha, Lda. to support the development of the new approach specifically to develop the new training materials, train the future KnM trainers, and roll out the trainings. In addition to that, an important aspect was the development of

a monitoring strategy to measure the quality of trainings, retention, and adoption rates. Rutasha deployed three consultants, two of whom are certified master trainers in the FBS methodology.

The pilot trainings commenced in November 2022 with a total of 55 lead farmers, 40 from Luteari and 15 from TA. The total number of farmers trained was 1500, 1200 under Luteari and 300 under TA. Many of the farmers had previously been trained in FBS and GAP.

55 lead farmers trained as KnM facilitators

1,500 smallholder farmers trained in KnM approach

In the following sections, the main lessons learned and recommendations from the pilot activities are presented.

1. Design of the extension programme

APPROACH / METHODOLOGY:

- KnM uses a cascading approach (figure 1) involving technicians to train and coach lead farmers and lead farmers to train groups of farmers in the communities.
- Other than FBS and GAP trainings, which are implemented separately, KnM combines both approaches and is taught concurrently throughout the agricultural season.

DESCRIPTION OF THE MAIN ACTIVITIES:

- KnM trainings usually take place twice a month, however, groups have often decided to meet every week to share experiences and discuss agricultural challenges amongst themselves.
- At the beginning of the agricultural season, from September to December, training sessions are more demanding, and farmers should be informed about the time effort required from them.
- While trainings were scheduled according to the preferences of each farmer group, either in the morning

or in the afternoon, experience has shown that there is greater participation in the KnM sessions in the morning versus the afternoon, and training sessions should be scheduled accordingly.

MAIN ATTENTION POINTS:

- ❗1 Frequency of trainings
- ❗2 Workload for farmers
- ❗3 Timing of training sessions

BEST PRACTICES:

- 💡1 Agree on training frequency with group; meet at least twice per month.
- 💡2 Inform farmers about the workload expected from them.
- 💡3 Schedule training sessions to take place in the morning.

TIPS FOR IMPLEMENTATION:

The lead farmer must explain the advantages of having trainings in the mornings to training participants.

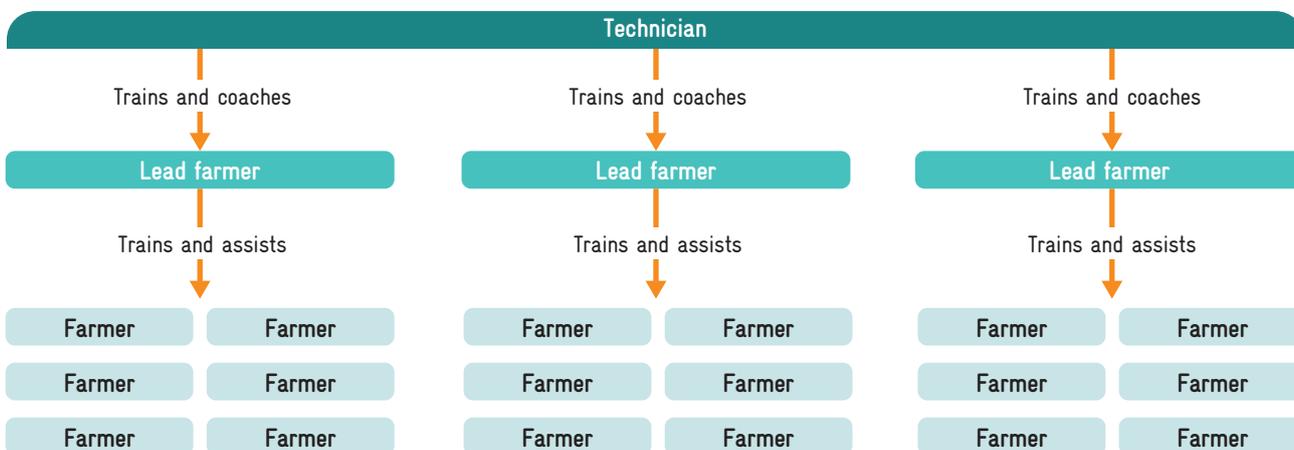


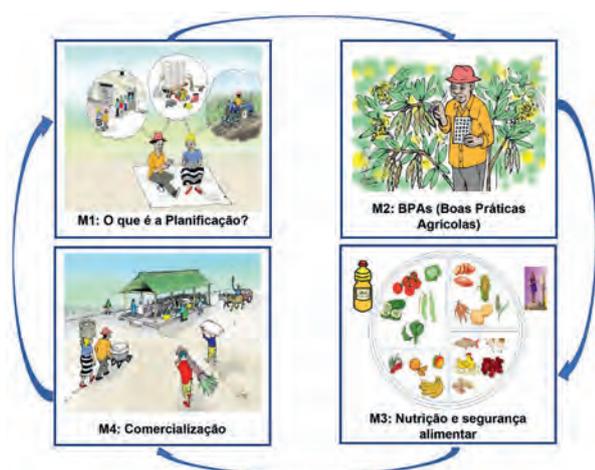
Figure 1. The cascading approach to farmer training



2. Revision and adaptation of training materials (crop-/value chain specific)

APPROACH / METHODOLOGY:

KnM training materials are tailored to the needs and characteristics of the smallholder farmers and take into account lessons learned and recommendations from previous training approaches.



Experiences from the pilot: Even where farmers are literate, the habit of planning and recording activities, expenses, and revenues is low with approximately 50% using the farmer booklets to make records.

DESCRIPTION OF THE MAIN ACTIVITIES:

- Review of existing training materials on FBS, GAP and CCA.
- Obtaining feedback on FBS and GAP trainings from partners, technicians, and farmers, who have been previously involved in the trainings.
- Adapt training materials for KnM trainings, including:
 - The **trainer's manual**: a full training guide that discusses all aspects of the agricultural production cycle including planning, GAP, nutrition and food security, commercialisation, and savings, and additionally gives guidance on learning goals per module, duration of the sessions, facilitation methods, and competencies to be obtained by the farmer at the end of each module.
 - The **farmer's booklet**: a compressed version of the trainer's manual with reduced text, more visuals and additional pages to allow the farmers to record their farm's business and stimulate self-study at home.
- Considering that many farmers in the KnM trainings are not fully literate, **visuals** are an important tool to increase the understanding of the training contents. Print-

ed in colour on A4 paper, images stimulate discussions and increase the learning effect during training sessions.

- **Record-keeping** by farmers is highly encouraged in KnM as over time it enables the farmer to gain a better understanding of their costs, revenues, and margins. This helps them to think of farming as a business and make more rational decisions, including greater strategic investments and choices around what to produce and which inputs to use.
- Many farmers are not literate, impacting their ability to make use of the templates to record their costs, revenues and calculate profits.
- There is a need to support **literacy training for farmers** and to impress upon them the importance of record-keeping.

MAIN ATTENTION POINTS:

- ❗ 1 Analysis of existing training materials
- ❗ 2 Tailor the farmer's booklet to the characteristics of the beneficiaries
- ❗ 3 Make use of visual materials

BEST PRACTICES:

- 💡 1 Regularly adapt training materials for trainers and farmers based on lessons learned from previous trainings.
- 💡 2 Integrate visuals in the materials for better understanding of the training contents.
- 💡 3 Make the booklet more user-friendly for a target group with low literacy to increase adoption and monitor the use of the booklet by technicians (e.g., a check list of key KnM tools that farmers are expected to adopt and implement).

AVAILABLE RESOURCES / TOOLS

All training materials are available for downloading on <https://www.giz.de/en/worldwide/32209.html> and can be adapted to the specific needs of different crops and value chains and used freely, provided the source is mentioned: [GIZ / Green Innovation Centre for the Agri-food Sectors].

TIPS FOR IMPLEMENTATION

Use one A4-size visual with illustrations per small group of 5 farmers who can share the image and discuss the illustrations amongst themselves before sharing their thoughts in plenary. This means approximately 4-8 visuals for a learning group of 20-40 participants.

(Further) reduce the text in KnM farmer manuals and increase the number of images to enhance the impact of the training materials, especially for women.

3. Recruitment and training of field technicians (including educational and skills requirements)

APPROACH / METHODOLOGY:

Key to successful implementation of KnM are strong skills of implementing staff, particularly the company staff involved in extension services to farmers.

In the KnM pilot, **19 potential trainers** participated in the ToT (14 male, 5 female). The training consisted of **three days theoretical training and two days practical training** where the training manuals were tested with farmer groups in the field.

DESCRIPTION OF THE MAIN ACTIVITIES:

- Establish recruitment criteria prior to selection to ensure adequate training and supervision of lead farmers through technicians: agricultural background, experience in training farmers, residence in the communities they work in, and fluency in local languages spoken by farmers in the region of implementation (see page 8) .
 - New KnM trainers must participate in a **ToT** to be qualified to transmit knowledge to lead farmers and assist them in the trainings. The ToT will familiarise future KnM trainers with the implementation of the cascading system of training smallholder farmers.
 - The training should include **theoretical** and **practical sessions** to rehearse the training manual and equip the prospective trainers with the necessary facilitation skills to deliver quality trainings for the farmers.
- Throughout the process, the trainers must undergo an **assessment against the KnM standards and criteria** (see next page), resulting in their qualification to use the KnM methodology. In addition, the two training materials (Training Manual and Farmers' Booklet) are tested in this process and then adapted and finalised.

MAIN ATTENTION POINTS:

- ❗ 1 Selection criteria for KnM trainers
- ❗ 2 Capacity development of new KnM trainers (ToT)
- ❗ 3 Assessment of trainers

BEST PRACTICES:

- 💡 1 Establish selection criteria prior to selection of field technicians
- 💡 2 Implement a ToT for all new KnM trainers with theoretical and practical sessions.
- 💡 3 Assess trainers based on the criteria and standards of a good KnM trainer.

AVAILABLE RESOURCES / TOOLS

Training programme available on the website.

TIPS FOR IMPLEMENTATION

- The GIZ ProEcon and Green Innovation Centre projects have been training a large number of master trainers of FBS and GAP trainers who might be available on the labour market.
- GIAE's partner, Young Africa AgriTech in Dondo, will integrate KnM in its curriculum.
- Contact GIZ on <name>@giz.de for references on FBS master trainers.



3a. Qualifications and Certification of KnM trainers

In order to maintain a high level of quality of KnM trainings, KnM trainers need to be regularly assessed, qualified and should eventually be certified. Figure 2 outlines this process.

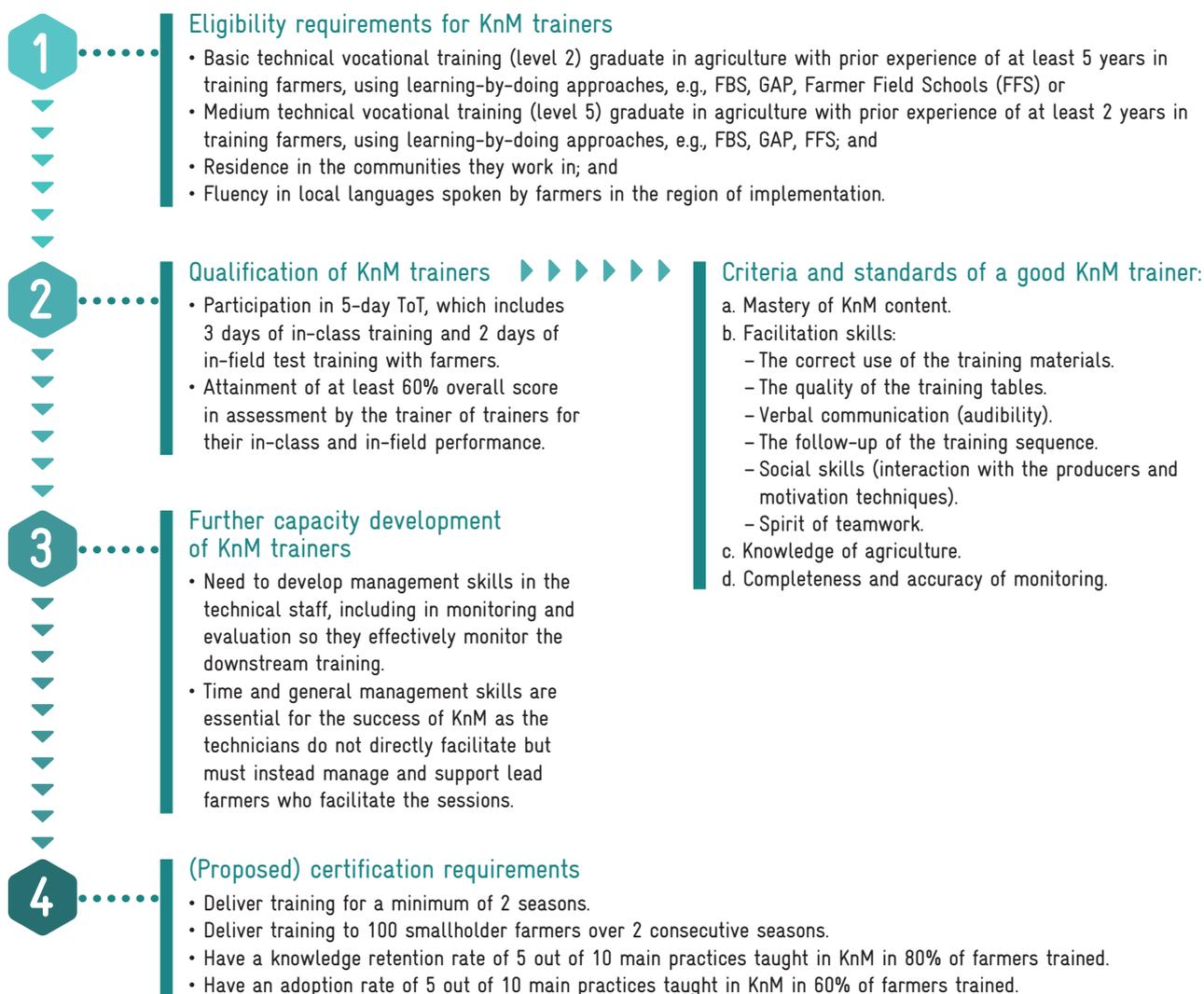


Figure 2. The qualification and certification process of KnM trainers



4. Registration of farmers (including criteria)

APPROACH / METHODOLOGY:

Criteria need to be established for the selection of farmers to make sure they will benefit from the KnM trainings. Special attention needs to be paid to the participation of women and youth and to the documentation of farmer data.

DESCRIPTION OF THE MAIN ACTIVITIES:

- Farmer registration for KnM needs to be done in July/ August to be able to initiate training in August/ September.
- Men and women farmers age ≥ 18 years, who plant the promoted crops or show willingness to do so and have access to land, are eligible for participation in the trainings.
- Although statistics show that more women in Mozambique are farmers than men, men tend to register more for trainings. In order to have a higher representation of women, it is advisable to set a gender quota of e.g., 60% women. Similarly, participation of youth has been relatively low, and it should be considered to establish quotas to increase youth participation.
- Farmers groups of 20-40 people should be formed according to geographic areas to limit distances to the training venue and facilitate participation.
- Document details of selected farmers in digital form (Excel or database software) to facilitate monitoring activities and follow-up on farmers.

MAIN ATTENTION POINTS:

- 1 Registration period.
- 2 Criteria for participating in KnM trainings, including quotas.
- 3 Documentation of farmer data.

BEST PRACTICES:

- 1 Register farmers timely in July/August.
- 2 Use quota and incentives to increase participation of women and youth.
- 3 Use digital systems for data management of farmer information for easier monitoring and follow-up.

AVAILABLE RESOURCES / TOOLS

GIZ has supported the development of the Farmer and Agent Management System ([FAMS](#)) to allow companies to record and analyse data on farmer training, inputs sales and sale of aggregated produce.

TIPS FOR IMPLEMENTATION

- Make a template to collect the information that needs to be documented for each farmer during the registration process, such as name, location, date of birth, gender etc.
- The staff involved must be trained in collecting and documenting the farmers' details before starting this activity.

5. Selection of lead farmers (including criteria)

APPROACH / METHODOLOGY:

To reduce the costs of implementing companies, KnM adopts a peer-learning approach where lead farmers facilitate trainings with supervision and support from the company's technicians.

DESCRIPTION OF THE MAIN ACTIVITIES:

- Lead farmers are usually selected by the other farmers based on the following criteria:
 - Influential farmers who can lead the group and encourage participation.
 - They own land and are willing to allocate parts of their land to be used for establishing a demo plot.
- Apart from those criteria, selected lead farmers must be literate in order to make use of and deliver the training materials.
- For lead farmers who are not literate, an assistant farmer shall be selected who is literate. Excluding lead farmers due to literacy may cause them to sabotage the effort and discourage other farmers from participating.
- It is further advised to select more women as lead farmers as it has been shown that women participate more actively when the trainer is female (see also 10. *Gender and youth*).
- Some lead farmers are also village-based agents¹. They are motivated to become facilitators by the potential increase in sales of inputs, as farmers adopt the use of improved inputs.

¹ Village-based agents, 'Agentes de Desenvolvimento Agrícola', are small agro-dealers based in the community that buy produce on behalf of the company and sell agro inputs.

MAIN ATTENTION POINTS:

- ❗1 Literacy skills.
- ❗2 Limited experience in training farmers.
- ❗3 Incentives for lead farmers.

BEST PRACTICES:

- 💡1 Selection based on literacy skills in addition to reputation in the communities.
- 💡2 Include a short, written assessment in the recruitment process to test literacy skills of lead farmers. Lead farmers who are not literate choose a deputy with good literacy skills.
- 💡3 As KnM involves demo plots for teaching of good agricultural practices, the company investing in the inputs for the demo plots and the lead farmer being able to keep the produce is a key incentive to lead farmers' participation as facilitators of KnM.

TIPS FOR IMPLEMENTATION

- Incentives are necessary to continuously motivate lead farmers to invest their time in training other farmers and ensure high quality training throughout the season.
- Implementing companies must identify these incentives (including the proceeds of the demo plot production, if applicable) and inform the lead farmers about their benefits during the selection process.

6. Training of lead farmers**APPROACH / METHODOLOGY:**

Being the facilitators of the KnM trainings and the knowledge transmitters, lead farmers need to be capacitated before the start of the season and be constantly coached.

In the KnM pilot, 55 lead farmers were trained as KnM facilitators to train 1,500 farmers.

DESCRIPTION OF THE MAIN ACTIVITIES:

- All selected lead farmers need to take part in a ToT which is organised and implemented by the partner company.
- In the 3-4 day ToT, the contents, structure, and methodologies of the training sessions are explained based on the training materials. For impactful training it is important to use **interactive methods** and practice the sessions in simulations.

- It is recommended also to include aspects of **facilitation skills for adult learners** in the ToT, especially considering that most lead farmers do not have previous experience in facilitating trainings.
- Especially in the first KnM training cycle, lead farmers need to be accompanied during the farmer training sessions and regularly **coached by technicians** to constantly improve their performance and the quality of the trainings.
- For those lead farmers who are not fully literate, it is advisable to organise **adult literacy training** so that they can fully make use of the training materials and deliver the training contents.

MAIN ATTENTION POINTS:

- ❗1 ToT.
- ❗2 Coaching of lead farmers.
- ❗3 Adult literacy training.

BEST PRACTICES:

- 💡1 KnM trainers (technicians) train the lead farmers in a ToT to teach training contents and facilitation techniques for adult learners.
- 💡2 Technicians accompany and coach lead farmers throughout the KnM training cycle.
- 💡3 Adult literacy training is offered for lead farmers with low literacy skills.

AVAILABLE RESOURCES / TOOLS

The training programme of lead farmers is available on the website.

TIPS FOR IMPLEMENTATION

The importance of capacitating the lead farmers cannot be underestimated. The ToT should be planned carefully (including logistics), and enough time should be allocated to ensure simulating training sessions with farmers in the field.

7. Design and establishment of demo plots**APPROACH / METHODOLOGY:**

The demo plots are prepared and established in the process of the trainings, by the participating farmers. They are used for the practical sessions in the KnM trainings to achieve a good learning effect and adoption.

In the KnM pilot, maize (2 or 3 varieties OPV and hybrid), pigeon pea and sesame were cultivated in the demo plots.

DESCRIPTION OF THE MAIN ACTIVITIES:

- The demo plots used for practical sessions in KnM trainings belong to the lead farmers. The technician assists the lead farmer/farmer group in identifying a suitable area to reduce risks related to weather, climate change, soil characteristics etc.
- The KnM manual as per GIAE covers the three crops (maize, pigeon pea and sesame) all of which are cultivated in the demo plots; the training manual, however, is adaptable to other crops and the demo plots should be designed accordingly.
- The size of the demo plot is important as to a certain extent it mimics the reality of the farmers themselves, who on average have a total production area of up to 1 ha (which is also the size of the demo plot recommended by public extension). However, land availability, practicability and costs of inputs need to be considered as well.
- It is important to pay attention to climatic and ecological particularities (soil type, low- versus high-lying areas, inclination etc.) within the project region which might lead to different planting and thus training schedules.
- The GIAE project has been promoting intercropping of pigeon pea and maize which is a practice that many farmers do in their own fields. However, if the first germination of pigeon pea fails, replanting might need to be done in a different field because of the advanced height of the maize crop.



MAIN ATTENTION POINTS:

- ❗ 1 Size of demo plots.
- ❗ 2 Climatic and topographic differences in the project region.
- ❗ 3 Maintaining the quality of the demo.

BEST PRACTICES:

- 💡 1 Define the size of the demo plots according to the reality of the farmer's land holding and taking into consideration land availability, practicability, and costs of inputs.
- 💡 2 Be flexible in planting the demo plots to consider the climatic and rain fall differences in the region – not all demos can be planted at the same time.
- 💡 3 Replant if crops do not germinate or develop well to keep participation rates in KnM trainings high. If replanting is not possible, farmer groups should use a neighbouring demo plot for their practical sessions.

AVAILABLE RESOURCES / TOOLS

- GAP Manual (on pigeon pea)
- GAP Implementation Guide

TIPS FOR IMPLEMENTATION

- It is important to pay attention to weather forecasts to avoid replanting in the demo plots.
- Companies should provide the seeds and other inputs early so that farmer groups can plant with the first meaningful rains (and then replicate the practices in their own fields).

8. Design and implementation of the M&E system (including reporting)

APPROACH / METHODOLOGY:

Monitoring of the training implementation is important to assess the quality of the training provided, and more importantly the impact achieved in the form of adoption of good agricultural practices in a climate-smart way. The adoption of good practices translates to contributing positively to the bottom-line for the implementing company – more inputs to sell and more produce to aggregate.

Next to quantitative data, the system should also allow for the gathering of qualitative feedback from trainers,

lead farmers and farmers alike, in order to constantly feed into the improvement of the training design and delivery, maximising returns.

DESCRIPTION OF THE MAIN ACTIVITIES:

- *Questionnaire to measure farmers' knowledge and adoption:* Companies need to have a history of before and after the implementation of KnM, through baseline, midline and endline surveys, they record and monitor adoption of good KnM practices and measure the success of the approach.
- *Questionnaire to measure farmer satisfaction:* Measuring farmers' satisfaction will help implementing companies to evaluate the performance of lead farmers and the quality of the trainings and, based on this, to constantly improve the trainings.
- *Regular reporting:* Technicians and supervisors should report weekly to the lead company about training progress, challenges and lessons learned. Based on the feedback provided the training can be adapted and improved throughout the training cycle.
- Supervisors need to evaluate the lead farmers' performance, identify weaknesses, and coach lead farmers accordingly.
- *The use of information, communication technology (ICT):* for the KnM pilot, Luteari used the Farmer Agent Management System (FAMS)² to collect baseline data. In addition to the survey function, FAMS is being used to collect lessons learned and qualitative notes by the technicians after each training session.
- For both paper-based and digital tools, it is necessary to adequately train the technicians before starting the field work and analysing the data.



FAMS is a digital platform that aims to improve efficient network management of private sector companies through farmer identification, IT-based communication tools for their technical staff and smallholder farmers, and through collection of agricultural production data. The tool was developed by the Mozambican NGO Emponderando, with support of GIZ and is in its final phase of development.

MAIN ATTENTION POINTS:

- ❗ 1 Necessary M&E tools.
- ❗ 2 Build capacities of staff.
- ❗ 3 The use of digital solutions.

BEST PRACTICES:

- 💡 1 Regularly collect and analyse data to measure the quality and impact of the trainings.
- 💡 2 Train the staff in the usage of the tools as well as in data collection methods and data analysis.
- 💡 3 Establish a regular reporting system for KnM trainers/supervisors.
- 💡 4 Use ICTs to improve the efficiency of training and data collection and lower the costs of training in the long run.

AVAILABLE RESOURCES / TOOLS

- Questionnaires for measuring impact and farmer satisfaction.
- FAMS
- Data collection freeware, e.g., KoBo Toolbox, ODK Collect

TIPS FOR IMPLEMENTATION

- In a wider application of farmer data management, georeferencing of farms and collecting data on farmer input use, production, and marketing will, over time, build the credibility / creditworthiness of those farmers to eventually being able to access inputs on credit and agro-input insurance.
- The importance of knowing your customer (KYC) for access to financial services cannot be underestimated.

² For more information on FAMS see: <https://equipmoz.org/projects/tech-team/farmer-agent-management-system/>

9. Organisation of the farmer training (including logistics and materials)

APPROACH / METHODOLOGY:

Smallholder training is done primarily from farmer-to-farmer.

An early start of the trainings will enable the farmer to plan properly and procure farm inputs on time.

DESCRIPTION OF THE MAIN ACTIVITIES:

- Training materials need to be organised for all participating lead farmers before the start of the KnM training cycle and launch of the agricultural season in August/September.
- The technician shall assist the lead farmer/farmer group in identifying a training venue (for theoretical sessions) and area for the establishment of a demo plot (for the practical sessions). The training venue can be indoors (classrooms, churches etc.) or outdoors (under a tree) but should be in proximity to the demo plot.
- Lead farmers must be equipped with the following training materials: Trainer manual; farmer booklets; laminated A4 images; depending on the session, eventually XXL paper (to draw tables); nails; markers; calculators; measuring tape/rope etc. The lead farmer will need to draw tables in preparation for some of the sessions for which he should be assisted by a technician.
- The company must ensure that farm inputs (seeds, fertilisers etc.) are distributed on time so that seeds can be sowed with the first meaningful rains (see also section 7. *Design and establishment of demo plots*).

MAIN ATTENTION POINTS:

- 1 Preparation of training materials and selection of training venue.
- 2 Assistance of lead farmer.
- 3 Provision of farm inputs.

BEST PRACTICES:

- 1 Distribute training materials early so that training sessions can start in August/September.
- 2 Assist lead farmer in the preparation of training materials, including drawing tables.
- 3 Distribute farming inputs in time before the rainy season.

AVAILABLE RESOURCES / TOOLS

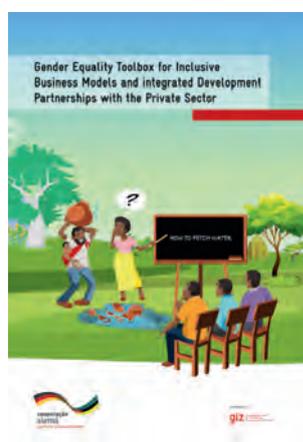
Complete list of training materials.

TIPS FOR IMPLEMENTATION

If the start of the training is postponed to October or November, it coincides with the onset of rains when farmers are busy preparing their fields and procuring inputs, so they may not have enough time to attend all the training sessions.

10: Gender and youth

APPROACH / METHODOLOGY:



Women constitute the majority of smallholder farmers, accounting for 63% of the agriculture unskilled labour force³. This is echoed in the ratio of male to female farmers in the network of many SMEs in Mozambique. Gender considerations and integrating women is therefore important for yielding good results.

DESCRIPTION OF THE MAIN ACTIVITIES:

- The **timing of trainings** must be carefully considered to maximise women's participation. Women have a high time burden from domestic duties and are also often responsible for the more laborious productive tasks such as planting.
- In **mixed gender learning groups**, women farmers often do not actively participate. Cultural norms in most rural areas are male dominated and women do not have a voice around men.
- During trainings, farmers tend to divide activities by gender according to their day-to-day life e.g., in plot measurement exercises, the men will measure (literate work requiring more thinking) while the women will dig the holes in measured spots and plant (laborious work requiring less thinking). This results in women not learning some of the concepts taught whereas in all female groups, the women fully participate in all activities and grasp more content.
- Women are also more comfortable with a female facilitator so **increasing women lead farmers and technicians** can increase women's participation.

³ JICA. (2015). Country Gender Profile: Mozambique Final Report 2015. [online] Available at: https://www.jica.go.jp/activities/issues/gender/reports/ku57pq00002hdvy2-att/moz_2015_en.pdf

Companies implementing KnM can benefit from strengthening their capacity to integrate gender by using tools from GIZ's Gender toolbox for inclusive business models.

- Companies should consider **women as a unique market segment** and do their strategic planning and implementation accordingly to earn more (see AUDA-NEPAD 'Gender Makes Business Sense'⁴ approach).
- Tying participation in trainings to provision of credit can deter women farmers from participating as they are more risk averse.

MAIN ATTENTION POINTS:

- ❗1 Timing of trainings.
- ❗2 Mixed versus women-only groups.
- ❗3 Deployment of female lead farmers and technicians.

BEST PRACTICES:

- 💡1 Consult the women in the farmer group before deciding on training times to maximise women's participation.
- 💡2 Promote women-only farmer groups to ensure that women participate actively and take part in all practical farming activities.
- 💡3 Use more women lead farmers and technicians to increase women's active participation.

AVAILABLE RESOURCES / TOOLS

- GIZ's Gender Toolbox⁵.
- AUDA-NEPAD 'Gender Makes Business Sense'
- TechnoServe's guide for an Unconscious Bias Training

TIPS FOR IMPLEMENTATION

Unconscious bias trainings can reduce the gender bias in the groups and result in a task division that goes beyond the typically male- and female-considered tasks.

3.2 Drivers and barriers to adoption

For the private sector in implementing KnM

- Key driver: Although KnM is comparatively cheaper than FBS and GAP to implement, there are still high costs associated with it. For implementation to be worthwhile, the training must translate into increased sales of inputs and volumes aggregated as a result of increased yield.

For the smallholder farmers, key drivers of and barriers to adopting practices include:

- providing credit to participants of KnM in order to invest in inputs to implement the practices taught can increase participation in the sessions as well as adoption of practices.
- literacy is a key driver of the implementation of planning and managing activities like record-keeping, and materials need to be adapted to recognise this.
- in the case of climate change, some reasons for not implementing mitigation practices cited include lack of resources to implement some practices, especially lack of plants for agroforestry and that some practices such as mulching and composting are too labour intensive.



⁴ <https://aspyee.org/gmbs>

⁵ Gender Equality Toolbox for Inclusive Business Models and integrated Development Partnerships with the Private Sector, GIZ Mozambique, 2021 – available from GIZ upon request.



Cost and benefits

4.1 Implementation costs for the company

The main cost of the implementation of KnM consists of the salary costs of the technicians, their transport and communication and their supervision, which constitute about two-thirds of the overall cost. This is a necessary investment in the quality of the training service to be provided in order to achieve the desired outcome of increased productivity and income for both the farmers and subsequently also for the company. Other costs concern the printing of the training materials, the inputs (seeds, fertiliser, pesticides, herbicides) for the demo plots and training materials for the field training.

4.2 Return on investment

After about two seasons of training, farmers are expected to adopt the good practices on their farms, which can increase productivity by 30-40%. As they become more successful business managers, farmers will start investing in inputs, which has the potential to increase their yields by another 30-40% and make smallholder farming profitable. Depending on availability of labour, they might later opt to increase the size of their farms, which will further boost volumes of produce for sale.

The return on investment for an average farmer can be summarised as follows:

Based on earlier experience, it is feasible to increase farmer productivity by up to 80% compared to a baseline situation of poor farmer practice and zero external inputs use.

This means that, after the third year, the farmer will break even (excluding own labour) and can start making money.

A major limiting factor is labour, which is scarce in the peak seasons.

For farmers to be able to invest in their production (beyond their family labour), initially some form of credit provision for inputs will be needed.

Registration and training of farmers will be beneficial to improve their credit worthiness. In order to mitigate increasing climate risks, some form of input insurance will have to be developed, coupled with life-insurance for the farmer, to avoid excessive indebtedness.

When deciding on expansion, (once nutritional requirements are met - calculated at 600 kgs of maize for a family of six), farmers will prioritise cash crops such as sesame.

Rendimento médio do agricultor			pressupostos para um agricultor médio					
Categoria	Descrição	Unidade	baseline	1º ano	2º ano	3º ano	4º ano	5º ano
Productividade								
Aumento da produtividade	Milho	kg/ha per produtor	1,000	1,150	1,350	1,550	1,750	1,800
	Feijão boer	kg/ha per produtor	300	345	405	420	420	420
	Gergelim	kg/ha per produtor	150	173	203	233	263	270
Aumento de área cultivada	Milho	área cultivada em hectares	0.60	0.60	0.66	0.75	0.84	0.90
	Feijão boer	área cultivada em hectares	0.10	0.10	0.12	0.20	0.20	0.20
	Gergelim	área cultivada em hectares	0.10	0.12	0.11	0.20	0.30	0.30
	Total área em hectares		0.80	0.82	0.89	1.15	1.34	1.40
Produção								
Produção total por agricultor								
	Produtividade x área cultivada por agricultor							
Milho	kg por produtor por ano		600	630	891	1,163	1,470	1,620
Feijão boer	kg por produtor por ano		30	35	47	84	84	84
Gergelim	kg por produtor por ano		15	20	25	47	79	81
	Produção total em kgs		645	744	963	1,299	1,633	1,785
Comercialização								
Disponível para venda								
Milho	produção menos consumo próprio em kg		90	291	563	870	1,020	1,020
Feijão boer			20	25	27	34	44	44
Gergelim			10	15	20	42	74	76
	Disponível para venda (kg)		30	329	338	658	968	1,140
Total das vendas de excedentes por agricultor								
Milho	Vendas a preços de mercado (MZN)		900	2,910	5,625	8,700	10,200	10,200
Feijão boer			400	490	532	1,080	880	880
Gergelim			450	668	914	1,868	3,319	3,420
	Total de vendas de excedentes em MZN		850	2,058	4,356	8,573	12,899	14,500
Uso de insumos por agricultor								
Milho	Semente de Milho		1,200	1,200	1,320	1,500	1,680	1,800
Feijão boer	Semente de Feijão Boer		104	104	120	208	208	208
Gergelim	Semente de Gergelim		71	81	88	141	212	212
	Custo total sementes (MZN)		1,375	1,385	1,528	1,849	2,100	2,220
Outros insumos (fertilizantes, pesticidas, fungicidas)								
Milho	Outros insumos para Milho		600	600	660	750	840	900
Feijão boer	Outros insumos para F. boer		52	52	60	104	104	104
Gergelim	Outros insumos p. Gergelim		282	324	353	564	846	846
	Total custo outros insumos		934	976	1,072	1,418	1,790	1,850
	Custos totais dos insumos		2,309	2,361	2,600	3,267	3,890	4,070
	Margem bruta total para o produtor médio em % dos custos de insumos		(1,459)	(304)	1,758	5,306	9,009	10,431
			-63%	-13%	68%	162%	232%	256%

Figure 3. Cost-benefit projections for an average farmer applying KnM



4.3 The cost-benefit model

The company in turn, will benefit from increased volumes of both inputs sold and from aggregated produce sold on to exporters, commodity traders, and the food and feed industry.

Based on assumptions and estimates from earlier experiences with farmer training, a spreadsheet was developed to simulate the costs and benefits of the KnM approach, which can be downloaded from <https://www.giz.de/en/worldwide/32209.html>. It can be fully adapted to specific agricultural crops and allows for “tweaking” of assumptions on prices, margins, productivity, land use, input use, costs of training, ratios of staff to (lead) farmer, etc. to test different scenarios. It can be used freely, provided that the source is mentioned: [GIZ / Green Innovation Centre for the Agri-food Sectors].

Below we present a summary of the outcome for a fictitious company of just one such simulation, which is for illustration purposes only.

Resumo da empresa dos resultados projectados		projeções							
Categoria	Descrição	Unidade	baseline	1º ano	2º ano	3º ano	4º ano	5º ano	
Volumes / quantidades projectadas									
Vendas de produtos agregados pela empresa líder	Milho	kg por ano		507,750	1,693,725	3,540,600	5,990,100	8,601,600	
	Feijão boer	kg por ano		25,000	96,919	200,295	328,195	442,595	545,970
	Gergelim	kg por ano		12,500	48,960	143,965	291,478	480,940	676,965
	Total de kg de produtos vendidos por ano		37,000	754,629	2,037,985	4,162,773	6,814,735	9,824,535	
Vendas de sementes	Semente de Milho	kg por ano		15,000	42,700	84,700	125,520	170,700	
	Semente de Feijão Boer	kg por ano		1,000	3,730	6,472	10,632	14,700	
	Semente de Gergelim	kg por ano		575	1,366	2,622	4,552	6,897	
		Total de kg de sementes vendidas por ano		16,575	52,796	93,844	140,704	192,297	
Vendas de outros insumos	Outros insumos para Milho	MZN por ano		750,000	2,385,000	4,213,500	6,276,000	8,535,000	
	Outros insumos para F. boer	MZN por ano		60,000	209,500	420,000	691,000	961,000	
	Outros insumos p. Gergelim	MZN por ano		302,500	1,263,805	2,464,600	4,263,500	6,483,100	
		Total de outros insumos vendidos em MZN		1,354,500	3,858,305	7,098,100	11,240,500	15,979,100	
Vendas previstas									
Vendas de produtos agregados pela empresa líder									
Milho	MZN por ano		7,173,000	20,724,000	42,882,000	71,881,200	103,219,200		
Feijão boer	MZN por ano		600,000	2,326,670	4,907,000	7,876,680	10,622,780		
Gergelim	MZN por ano		750,000	3,030,360	6,395,500	12,408,650	20,342,900		
	Total das vendas de produtos (MZN)		8,523,000	26,080,970	54,184,500	92,166,530	134,984,880		
Vendas de sementes melhoradas e agricultores treinados	Semente de Milho	MZN por ano		1,500,000	4,270,000	8,627,000	12,552,000	17,010,000	
	Semente de Feijão Boer	MZN por ano		136,000	419,000	841,360	1,382,160	1,922,960	
	Semente de Gergelim	MZN por ano		300,000	700,950	1,310,700	2,100,795	2,934,210	
	Total das vendas de sementes (MZN)		776,000	2,619,950	5,079,060	7,034,955	9,867,170		
Vendas de outros insumos (fertilizantes, pesticidas, fungicidas)	Outros insumos para Milho	MZN por ano		750,000	2,385,000	4,213,500	6,276,000	8,535,000	
	Outros insumos para F. boer	MZN por ano		60,000	209,500	420,000	691,000	961,000	
	Outros insumos p. Gergelim	MZN por ano		302,500	1,263,805	2,464,600	4,263,500	6,483,100	
		Total das vendas de outros insumos (MZN)		1,112,500	3,858,305	7,098,100	11,240,500	15,979,100	
	Total das vendas (MZN)		10,411,500	32,779,244	68,781,660	116,682,535	171,811,150		
Custo da Mercadoria Vendida (CMV)									
CMV Total - produção agregada dos agricultores									
			3,645,200	10,794,441	27,390,075	55,086,588	90,624,700	127,398,742	
Custo da Mercadoria Vendida - sementes melhoradas									
			8,682,300	4,689,171	6,413,110	12,769,850	17,536,800	23,911,130	
	CMV - Outros insumos (fertilizantes, pesticidas, fungicidas)		104,000	3,605,004	6,679,088	9,600,328	12,783,228	16,280,260	
	Total do Custo da Mercadoria Vendida (MZN)		3,645,200	18,088,616	41,482,273	77,456,776	120,944,728	165,590,134	
Margem bruta sobre as vendas									
	Margem Bruta Total em todas as vendas (MZN)		6,766,300	4,140,128	9,228,797	17,251,470	27,814,067	37,441,630	
	em % das vendas		64%	18%	18%	18%	18%	18%	
Custos directos de implementação de KnM									
Despesas fixas (por material e equipamentos)									
			919,522	1,813,078	1,825,468	1,186,666	523,000	433,225	
Custos recorrentes (material)									
			79,635	57,385	91,725	110,475	110,475	84,425	
Custos de desenvolvimento (para a área piloto)									
			228,514	702,503	11,789,571	1,416,230	1,616,230	1,425,165	
Custos de técnicos (tempo de pessoal técnico)									
			2,730,000	2,730,000	3,822,000	4,550,000	4,550,000	4,550,000	
Outros (comunicação, transporte)									
			660,000	924,000	1,100,000	1,100,000	1,100,000	1,100,000	
	Total Custos Directos da Implementação do KnM		6,712,671	5,886,053	7,848,863	8,483,376	7,700,611	7,652,815	
	Margem bruta após implementação do KnM		(1,827,827)	1,385,834	5,888,094	19,414,516	29,858,789	39,888,815	

Figure 4. A summary of the outcome for a fictitious company of a cost-benefit simulation for illustration purposes only.

For companies seeking to aggregate produce from small farmers, **economies of scale** are all important. Quantities per farmer and margins are small, which calls for a reduction in the transaction costs. (Farmer-to-farmer training is one such means to reduce costs, as is the use of village-based agents and digitalisation tools).

The example in figure 4 is for a company that aims to train and trade with 14,000 farmers.

As this is an example derived from a real case, there is a baseline included. For new companies the baseline will be zero and the growth will be less steep. The model allows for experimenting with different hypothesis / scenarios.

Establishing **long-term relations based on repeat transactions** will build trust and goodwill to grow the company and the farmers in its network, a precondition for sustainable growth.

As is typical for agribusinesses, the initial investment is rather high but with high returns over time.

As the company gains experience with the approach and builds its farmer network, it can reach economies of scale, which would allow the cost per farmer trained per year to come down to around MZN 1,000 / EUR 15, which is still considerable, but far cheaper than approaches such as FBS and GAP implemented separately by NGOs and donor projects.

There will be a need to finance or subsidise the initial deficits, which in this example, would be about EUR 7 per farmer trained, which is much lower than the cost of traditional approaches.





5.

Further development

5.1 Non-chemical inputs (agroecology)

At the moment, KnM is being implemented by companies that are also in the business of selling inorganic inputs (fertilisers and pesticides).

- There is a need over time to include more organic alternatives to plant nutrition and pest and disease control, which are not only more environmentally friendly but cheaper for farmers, likely increasing their adoption compared to more expensive inorganic alternatives.
- Implementing companies must be made to understand the trade-off between possibly earning less on the sale of organic inputs, while – as aggregators – they may earn more on increased produce to aggregate and contribute to a better environment.

5.2 Master training facility

While initial feedback on KnM from both farmers and the implementing partner companies has been positive, there must be a master training facility external to the company for it to be scalable.

The role of the master training facility is to update the content periodically to keep it relevant (new practices, new value chains etc.) and oversee quality of implementation training, coaching and certifying trainers.

This is currently missing for KnM. One possible institution to take over this role are technical and vocational education training (TVET) institutions as part of their curriculum, and they can leverage ‘selling’ this service to their private sector partners.

5.3 Promotion and upscaling

To maximise adoption of KnM, the following needs to be done:

- 1 Development of a Master Training Facility responsible for training trainers, certification, developing content, and conducting quality control.
- 2 Promotion of the KnM approach through the GIZ FBS Facility, the GIZ Sector Network SNRD and other GIZ projects and in national networks such as the platform of donors in the agricultural sector (AgRed) meetings and the Market Systems Development (MSD) network.
- 3 Sharing experiences / success stories in order to increase interest in the approach.
- 4 Networks of consultants and agronomists need to be made aware of the existence of this new approach, so that they can promote KnM to their clients.
- 5 A-TVET will need to be supported to integrate KnM into their curricula and possibly certify trainers.





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