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Dynamic monitoring and results

How the Propcom Mai-Karfi project designed and implemented an adaptive measurement system

Case study

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1. Introduction

Market systems development programmes are implemented in complex and dynamic environments. Management teams need to take a flexible and adaptive management approach, enabled by access to timely information from the monitoring and results measurement (MRM) system on the progress of each intervention and changes in the wider market system.³ MRM systems need to be highly adaptive and responsive and need to integrate innovative ways of collecting data.

Propcom Mai-karfi

Propcom is a six-year programme funded by the UK Government Department for International Development (DFID). The programme uses the market systems development approach in agricultural and rural markets. It works with different stakeholders including the government and private companies to enable agricultural and rural markets to work better for men and women living in poverty. Propcom aims to stimulate and facilitate a variety of changes in markets by:

- Improving commercial relations between large processors, traders and poor farmers in markets such as soy and agricultural inputs.
- Increasing investment by the private sector in rural markets, which poor farmers, entrepreneurs and consumers rely on for important goods and services, agricultural inputs, storage, agricultural machinery and poultry.

As of October 2016, the programme is implementing 17 interventions with 27 market actors in five agricultural markets in northern Nigeria. Propcom is also scoping three new markets for interventions. By March 2018, the programme aims to increase the incomes of at least 500,000 poor men and women in 20 states in northern Nigeria.

2. Propcom's shea nut intervention

2.1 The shea market in Nigeria

Nigeria is the largest producer of shea nuts (425,000 metric tonnes per year) in West Africa. Shea trees can be found in 20 northern states of Nigeria, with commercial activity dominant in Kaduna, Jigawa, Kebbi, Niger, Kwara and Nassarawa. Nigeria's contribution to the world export market is relatively small (45,000 MT) however. Key constraints holding exports back include missing processing actors in the market system and a lack of quality standards and regulation in the market. According to the Nigerian Export Promotion Council, most shea nuts are exported through illegal border trading, which is estimated to lose the government ₦350 million every year.

Shea nuts play an important role in rural Nigerian communities in terms of employment and income generation, particularly for those involved in collection and butter extraction. Traditional shea butter production involves several steps, including collecting, sorting, crushing, boiling/roasting, grinding, separating the oils from the butter and shaping the finished product. These steps are done manually and nuts are normally picked and processed by groups of women. The total number of women involved in the industry has been estimated at around 850,000.

³ O'Sullivan, F. (2016) "BEAM Exchange Monitoring Guide", The BEAM Exchange, available at: <https://beamexchange.org/guidance/monitoring-overview/>

Prior to 2014, Nigeria supplied shea nuts to other countries in the region with more developed mechanical processing capacity, including Benin, Togo and Ghana. Results from a market assessment conducted by Propcom found that there was interest from local Nigerian firms to increase in country processing capacity. The assessment found three main systemic constraints in the market limiting the scale up of local processing and increasing incomes of women producers:

- 1. Low / variable quality of shea kernels produced by nut pickers:** In general, there is little differentiation between good and bad quality shea nuts among pickers. In addition, the techniques used to process the nuts are influenced by tradition. For instance, the Nupe ethnic group prefer to smoke their nuts making them more suitable for producing 'black soap', whereas in some parts of Kwara state, the Baruba ethnic group prefer to parboil their nuts, making them more suitable for cooking. Most women store their kernels in sacks made from plastic, which does not allow air to circulate and can lead to mould and the kernels turning black.
- 2. Limited access to price information, and low incentive to increase quality:** Shea nuts are sold throughout the year to either processors or local traders. A large proportion of shea collectors sell their produce within the first three months after harvest, usually at the market place closest to the farm gate. Prices are reached through bargaining, and they vary from one market to another, and according to the season. Women's bargaining power with middlemen and collectors is limited. This has a negative impact on their income and does not incentivise them to improve the quality of the nuts to the necessary standard for processing or export.
- 3. Lack of investment in large-scale processing:** Due to the limited interest from prospective investors, Nigeria has remained a supplier of shea nuts and has not moved higher up the value chain. Local manufacturers typically just produce soap or skin cream.

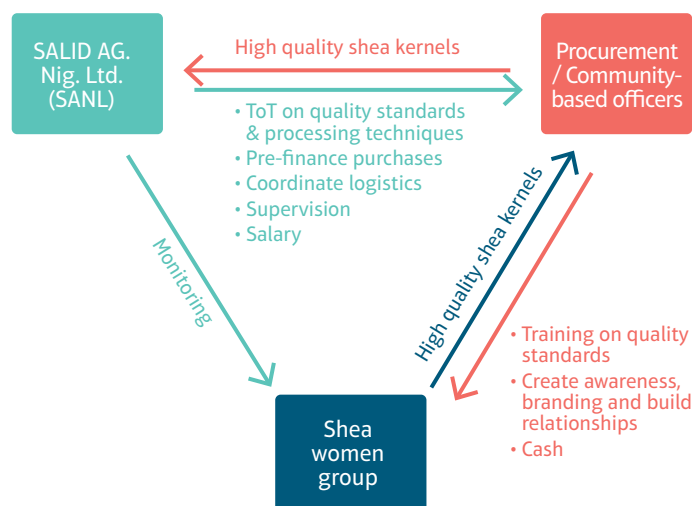
2.2 The intervention design

The intervention's objective was to improve the quality and supply chain efficiency in shea kernel trade in Niger, Kwara and Kebbi states and increase incomes for women producers.

Propcom designed three main work components to address the systemic market constraints, displayed in Figure 1 (overleaf):

1. Identify and engage potential new processor/buyer partners entering the shea market and help them build supply networks directly with women's groups in rural areas.
2. Improve the quality of shea kernels produced through capacity building support to procurement officers recruited by processors/buyers, who then train women producer groups on best practices for producing high-quality kernels.
3. Incentivise the continued production of high-quality, high-volume shea nuts by paying premium prices to women producers, supporting processors/buyers to design efficient supply chain systems and supervising procurement officers and pre-financing purchases.

Figure 1: Shea nut intervention design



Propcom piloted the intervention in partnership with SALID Agriculture Nigeria Limited (SANL), a local shea trading company with aspirations to build a processing facility. Due to the time taken collecting all the relevant data to design and develop the intervention, Propcom had to delay the pilot until June 2015 and the start of the shea growing season. The team decided to implement a set of pre-pilot activities (July-Sept 2014) in order to test some assumptions in the intervention design and learn more about the market in preparation for a full-scale pilot in 2015. These activities included:

- Capacity building of SANL’s procurement officers to strengthen links between the company and women producer groups.
- Identifying and training women’s groups to process quality shea nuts.
- Develop SANL’s internal monitoring capacity, including monitoring training activities with women’s groups and recording procurement patterns (volumes, prices, other supply chain costs).

SANL monitored the activities and shared the information with Propcom.

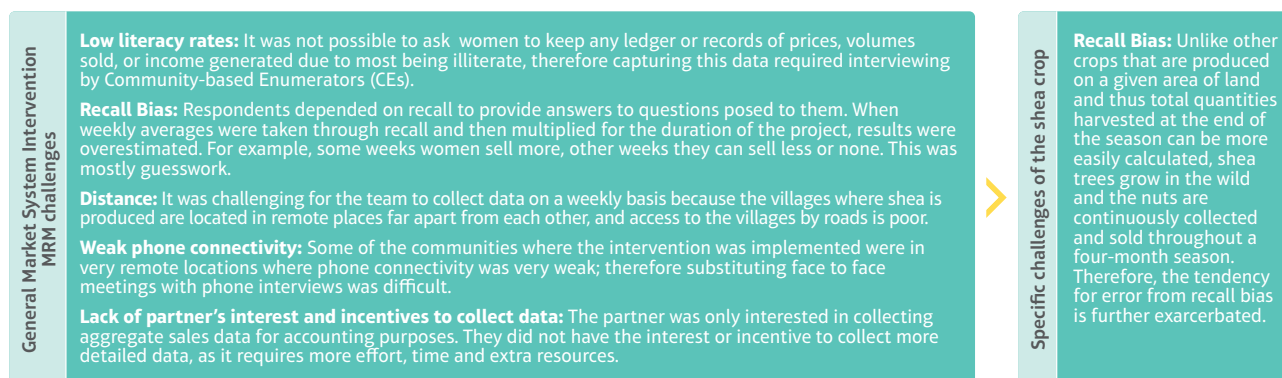
3. Propcom’s monitoring and results system

3.1 Pre-pilot monitoring and results measurement

Data on shea kernel prices, the quantities collected and sold by women’s group beneficiaries was collected during the baseline survey in April 2014. In addition, research officers conducted an interim assessment at the end of the pre-pilot in December 2014. The researchers found that women producers did not keep records and often forgot how much they collected and sold, so relied substantively on recall of prices, volumes sold, and income generated. Research also showed that SANL purchased 206 metric tonnes of shea kernels from 256 women, and each of them received an increase in net income of about ₦13,000 (£52)³ in 2014. Propcom also conducted spot checks on prices and volumes during the season when SANL was buying shea nuts.

³ 2 1 GBP= 250 NGN in 2014.

Figure 2: The main monitoring and results challenges



3.3 Developing a Dynamic and Adaptive monitoring and results system

As a response to the monitoring and results measurement (MRM) challenges in the pre-pilot phase of the intervention, Propcom's intervention and MRM teams developed a fit-for-purpose 'dynamic and adaptive' MRM system. The system is '**dynamic**' because it aims to capture in real time market information, which changes frequently. It is '**adaptive**' because the system itself is designed to evolve over time through learning in action, and to support the intervention to adapt to the constant changes in market conditions. The MRM system has two main purposes:

- '**Proving**' that the intervention is delivering results through robust data collection.
- '**Improving**' the intervention through using regular feedback to inform preventive or remedial action (adaptive management).

The key aspects of the system were:

Organisational structure: Initially, Propcom was using only research officers to monitor the interventions. This was expensive, time consuming and not very efficient since the officers were not able to effectively monitor all the interventions. In 2015, Propcom decided to implement a two-tiered structure, involving research officers and community-based enumerators

- **Four Propcom research officers:** full-time staff, whose role is to manage the work of enumerators and to compile and clean collected data.
- **One-two community-based enumerators in each state:** contracted, and in charge of collecting data from individuals/farmers in communities in real time or on a weekly/monthly basis.

Approach: The data collection approach was designed to estimate the total quantities women were selling during the 16-17 weeks of the season across different locations. In this way, Propcom would be able to triangulate the two data sets (data collected by enumerators and SANL's procurement data) to estimate the total outreach. A [quota sample approach](#) was adopted because a sampling frame/database did not exist at the beginning of the intervention. Propcom collected information from 70 volunteer women from 17 villages in two states, Niger (six villages) and in Kwara (11 villages), for approximately 16 weeks. This sample data was used to extrapolate for the overall group/population.

Recruitment and selection of the enumerators: Propcom worked in partnership with groups of women shea collectors, which proposed the most suitable candidates. This participatory process ensured that the enumerator is: a) someone that the community group trusts, accepts and is comfortable working with; b) a person who speaks the same language; and c) someone with basic literacy skills who is able to capture data, and do basic analysis.

Training and Preparation: Propcom trained enumerators and research officers to ensure they reported data in a consistent way. The enumerators received enough hard copy templates to record the data on a weekly basis.

Payment and contracting: To engage enumerators to collect data consistently, Propcom paid them ₦5,000 per month (approx. £20).

Oversight and management: Each research officer was assigned one or two enumerators and tasked to phone them to collate data on a weekly basis. This enabled the officers to assess data quality in real time, monitor the partner’s field activities remotely, and make sure that enumerators were carrying out their duties properly. Officers were in charge of entering the data into a template then sending it to the MRM team.

Data analysis: All the information collected was aggregated into three reporting templates that captured average production, revenue and prices at the state level:

Figure 3: Monitoring and results reporting templates

of women by state:

State	# of women
Kebbl	0
Kwara	26
Niger	31
Total	57

Average by state:

State	Collected (kg)	Sold (kg)	Price / MT
Kebbl	-	-	-
Kwara	457	109	20,520
Niger	590	215	30,023
Total	529	166	25,536

Average by month:

Month	Collected (kg)	Sold (kg)	Price / MT
June	236	72	25,758
July	289	94	25,358
August	-	-	-
September	-	-	-
October	-	-	-
Total	529	166	25,536

of women by LGA:

LGA	# of women
Edati	11
Edu	5
Gbako	5
Kalama	15
Mokwa	5
New Bussa	10
Total	51

Average by LGA:

State	Collected (kg)	Sold (kg)	Price / MT
Edati	359	139	42,703
Edu	552	75	38,452
Gbako	890	543	18,750
Kalama	432	82	40,000
Mokwa	640	381	25,458
New Bussa	670	-	-
Total	529	166	25,536

Average by week:

Week	Collected (kg)	Sold (kg)	Price / MT
26	111	32	26,025
27	125	40	25,489
28	188	53	29,703
29	91	36	23,566
30	9	5	855
Total	529	166	25,536

3.4 Challenges in piloting the monitoring and results system

Throughout the pilot phase, the MRM team experienced the following challenges, and adapted the system accordingly:

Paying the enumerators: Propcom’s MRM team found it challenging to pay enumerators since most did not have access to bank accounts, while hiring them directly would have entailed additional workloads and potential delays to the start. As a solution, Propcom decided to work in partnership with SANL, which agreed, under a new clause in their contract, to pay enumerators at the same time as buying shea nuts from women producers. Propcom then refunded the money to SANL every quarter. The MRM team did not see any threat to the independence of the data collection process since the partner was simply acting as a conduit for payment. The data collectors were also independent of the women’s groups. In most of the cases, they were school teachers or people from the communities who were able to read and write, but who were not related to the women.

Inconsistencies in the way data was collected and captured, revealed during data analysis at the end of the season, included:

Data collection errors:

Different units of measurement (i.e. mudu³, bags and basins) were used to capture the quantities of shea kernel collected, processed into butter, sold and remaining (unsold). Propcom noticed that a basin has different measures in different states (i.e. in Kwara state 1 basin = 25 kg, whereas in Niger state 1 basin = 16 kg).

Data capture errors:

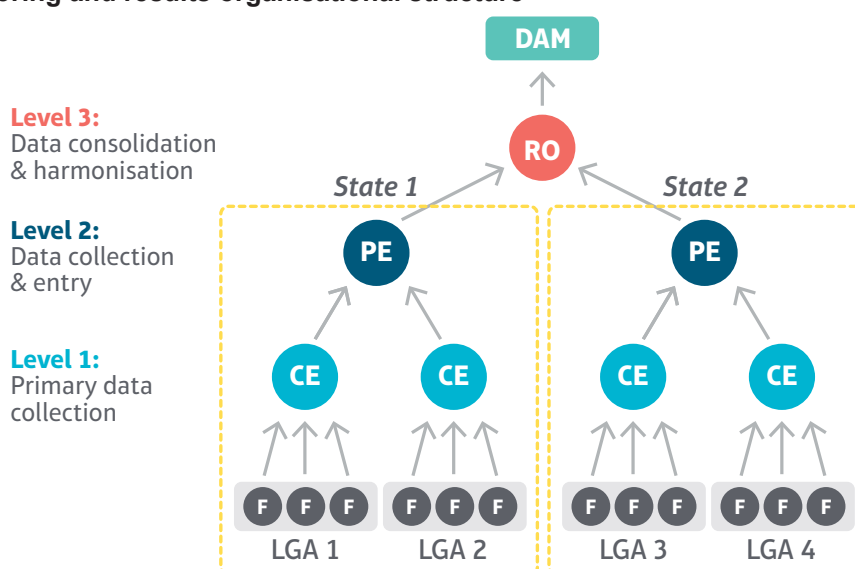
- Dates were inputted using different formats;
- Units were written differently by different enumerators;
- Quantities and units of shea nuts collected, processed, purchased and remaining were all recorded in the same column.

3.5 Adapting the monitoring and results system in the shea intervention

During the pilot in 2015, the system captured data on a weekly basis. However this did not help the team to adapt the intervention or advise SANL because most of the results emerged post-season. Propcom took forward the lessons learnt from that challenge, and in 2016, the team significantly improved the system so that is now both dynamic and adaptive. Propcom modified the MRM organisational structure, and standardised data collection methods. Now the information collected is entered into the database on a weekly basis and the results are updated automatically, providing immediate information to the team, and enabling them to provide partners⁴ with timely advice.

The intervention MRM organisational structure was adapted as the team learned: collecting data using the two-tiered organisational structure became less efficient as Propcom scaled up the approach to more interventions. In 2016, Propcom expanded this to a three-tiered structure involving enumerators, research officers and additional Propcom enumerators, part-time staff engaged periodically to monitor the activities of designated community group and cooperatives. Propcom enumerators were in constant contact with the community enumerators via mobile phones to ensure that when they encountered any challenges with data collection, they could assist them. This structure is shown in Figure 4⁵.

Figure 4: Monitoring and results organisational structure



³ A 'mudu' is used in the northern states of Niger as the local measure for food products.

⁴ In 2014 and 2015, Propcom Mai-karfi worked with SANL and in 2016 the team started working with a different partner (Karite Oil Nigeria Limited).

⁵ In Figure 4, DAM refers to the dynamic and adaptive MRM system.

Under the new structure, one research officer is responsible for one intervention rather than collecting the data from across the range. The officers manage the data collection so it is robust and timely. Putting one person in charge of an entire intervention helps them to get a better overall picture of the intervention and to manage it better. Additionally, using community-based enumerators reduced the costs of data collection. Propcom estimated that they spent a total of £987⁶ on data collection in 2015, compared to £7,278⁷ spent during the interim assessment in December 2014.

Benchmarking units of measurement for basin sizes: To find the different measures for each village, different samples of different measuring units were collected from respective states and weighed at SANL's warehouses⁸ to determine the weight of shea nuts per unit in kilogrammes. By making these changes, Propcom was able to accurately monitor prices partners were paying on a weekly basis. This allowed Propcom to make comparisons of the prices that the local traders were paying.

3.6 Adapting the monitoring results measurement system to new interventions

The MRM team learned from the shea intervention, and adapted the system to other interventions including those in the tiller and fertiliser subsectors.

The tillers intervention: In 2015, Propcom supported about 100 rural smallholder women's cooperatives to get access to power tillers through a funding mechanism in several states in northern Nigeria. The MRM team made several changes to the MRM system and added a third layer of data collection to capture data more effectively (see section 3.5). By adapting the MRM system and adding an additional tier, the MRM team managed to collect information from the tiller cooperatives more regularly. By using the information collected, the intervention team was able to discern which of the cooperatives was actually using the tillers and gain valuable insights as to why some of them were not.

The fertiliser intervention: In the fertiliser intervention, the MRM team managed to collect information from 25,000 farmers in real time. Propcom gave out 'booklets' to rural promoters who sold small packs of fertiliser to rural farmers and captured their sales data at the point of sale.

Collecting real-time sales data and collating them on a monthly basis allowed the MRM team to understand which of the fertiliser packs (1kg, 10kg or 25kg) were selling better, where they were being sold and in what quantities. It also allowed the team to know which of the trained promoters were active in selling fertiliser to smallholder farmers and thus get a sense of where the intervention was working.

4. Conclusions and recommendations

Monitoring systems need to be flexible enough to cope with the dynamic nature of market systems and their inherent uncertainties. When a monitoring system relies on recall of production or prices to measure impact the system is prone to recall bias. Establishing a dynamic and adaptive MRM system can address this issue, among others.

The main benefits from the dynamic and adaptive MRM system are:

1. Better data (quality): the system helped Propcom to record more accurately what was

⁶ This amount includes the PE's monthly salary and the phone call costs.

⁷ This amount includes RO's transport costs, accommodation and per diems.

⁸ Each of the partner's warehouses in the different states were fitted with a weighing scale

happening in different weeks in different villages. Without capturing this in real time, the information would be lost and Propcom would end up with unreliable estimates of the programme's outreach to women's groups.

2. **Accurate sampling frames to conduct impact assessments:** having a list of farmers which are the final users of the intervention helps facilitate the construction of accurate sampling frames to conduct impact assessments in the future.
3. **Credible reporting:** most market systems development projects estimate impact using certain assumptions (i.e. dividing total sales figures by average sales per farmer). The data collected using the Propcom MRM system has enhanced the accuracy with which the programme is able to estimate the impact of the intervention on women.
4. **The system helped with the adaptive management** of the intervention. Collecting data on a frequent basis provides an ongoing flow of information. This allows market teams to make any necessary adjustments (adapt and respond) while it is still possible to do so (as opposed to post-intervention assessments where it is too late to make any changes).
5. **Cost effective:** by using community enumerators Propcom managed to reduce the costs of data collection.

To be fit for purpose, MRM systems for market systems interventions should be dynamic and adapted to context and data requirements, therefore there is no prescribed way of setting up or designing a MRM system. However, there are some general recommendations that are important to consider:

- **Advance preparation:** allow sufficient time to recruit the right staff and other field agents, and undertake the necessary training and preparation of materials.
- **Collect data frequently** (if not in real time) before information is lost or recall bias becomes an issue.
- **Use an iterative process** to clean and analyse data: data collection, consolidation, and cleaning does not need to be a sequential process; the system should be able to identify errors in the data and fix them as soon as they are identified.
- **Engage a network of field-based data collectors** who can collect data cost-effectively.
- **Consider using financial incentives** when using community-based enumerators, and make sure that they will receive remuneration on a regular basis (i.e. mobile payment, through partners, etc.).
- **Invest in capacity building the MRM team:** it is key to train the relevant people on how to use and manage the system.
- **Work closely with the intervention partner** to align incentives for MRM.