

Measuring Systemic Change – The case of GEMS1 in Nigeria

Synopsis

Development programs aim to create changes that will continue to deliver benefits to their target populations beyond the project period. To do so, programs are designed to make changes not only sustainable but also systemic. Change is systemic when it addresses the underlying causes of market system performance that can bring about a better functioning market system'.¹ But assessing progress in making changes systemic and measuring the results of those systemic changes can be challenging. This case describes how the GEMS1 (support to meat and leather) Programme assessed systemic changes and the goal level results of those changes for an innovative business model in livestock feed finishing.

Authors: Nabanita Sen & Wafa Hafiz

Date: July 2015

Acknowledgements:

This is one of ten cases that have been developed by Hans Posthumus Consultancy². The preparation of these cases was supported by funds from the Swiss Agency for Development and Cooperation (SDC), provided through the DCED Trust Fund. We would like to thank them for giving us the opportunity to work on this case. The case we describe is drawn from GEMS1, to which we are indebted. We would like to extend our gratitude, in particular, to Mr Iliya B Duniya, and Kevin Billing from GEMS1 for their valuable contributions. We would also like to thank Aly Miehlabradt and Hans Posthumus for their valuable input into the case.

This case describes how the program has addressed a typical challenge in results measurement. The aim of the case is to provide insights that will be useful to other practitioners facing a similar challenge. The authors do not represent the DCED, nor do the views expressed in the case necessarily reflect the views of the DCED.

¹ DFID/SDC 2008 A synthesis of Making Markets Work for the Poor (M4P) approach

² The HPC consortium was led by Hans Posthumus (HPC) and consisted of Aly Miehlabradt (MCL), Ben Fowler (MSA), Mihaela Balan, Nabanita Sen (OU), Phitcha Wanitphon and Wafa Hafiz (H&S).

Table of Contents

1	The Challenge of Measuring Systemic Change	1
2	Introduction to GEMS1.....	2
3	Introduction to the Feed Finishing Intervention	3
4	Challenges in Measuring Change in the Intervention	6
5	Solutions for Measurement Challenges	7
5.1	Challenge 1: Defining direct and indirect farmers.....	7
5.2	Challenge 2: Assessing results in a data-poor environment	8
5.3	Challenge 3: Assessing if other companies crowd-in	11
5.4	Challenge 4: Assessing the results of crowding-in	12
5.5	Challenge 5: Identifying indirect farmers	13
5.6	Challenge 6: Measuring benefits for indirect farmers.....	14
6	The Benefits of Measuring Systemic Change	15

1 The Challenge of Measuring Systemic Change

This case discusses how to deal with challenges in measuring systemic change. Systemic change is defined as ‘change in underlying causes of market system performance that can bring about a better functioning market system’.³ Many private sector development programs partner with various market actors (private companies, government, civil society, NGOs) to create changes in market systems so that they perform better. Enterprises and people benefit ‘indirectly’ from systemic change even if they have no contact with the program (for example by copying the new practices of direct beneficiaries). (See Figure 1 for a simplified example).

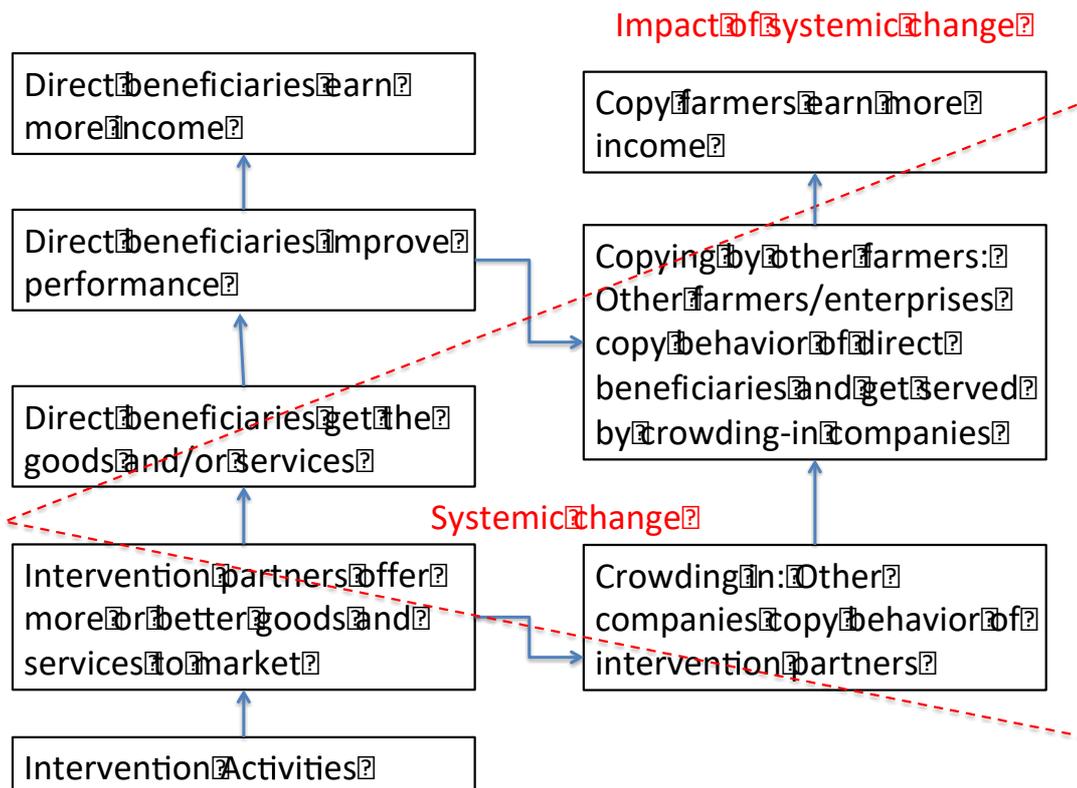


Figure 1: Simplified Example of Systemic Change

Measuring the impact of systemic change is particularly challenging because changes occur not through the program’s direct work, but as a result of that direct work. Key measurement challenges can be summarised as follows.

- In complex markets, systemic change often does not take place as expected. Since the market can react in different ways to a program’s intervention, systemic change will depend on the context and responsiveness of market players. Thus research often needs to be done in an investigative manner in order to identify change.
- There is no standard definition of indirect beneficiaries. Since systemic change can take place in different ways, indirect beneficiaries can also benefit in different ways. For example: one farmer might benefit via copying the practices of a direct beneficiary and another by getting access to a new product that has been introduced in the market. It is thus important to set a definition of each type of indirect beneficiary before starting measurement.

³ DFID/SDC 2008 A synthesis of Making Markets Work for the Poor (M4P) approach

- The identification of the potential beneficiaries of systemic change is challenging, as programs have no contact with them. Programs must develop appropriate measurement approaches based on the types of beneficiaries expected and triangulate data to ensure accurate identification.
- Attributing systemic change to interventions is particularly difficult, as the program often has no contact with indirectly benefited enterprises and individuals. The program needs to gather data to investigate if systemic changes can be traced back to its intervention, as change could also have occurred for many other reasons.

This case discusses the experience of the Growth and Employment in States 1 (GEMS1) program in Nigeria in measuring systemic change. It draws on their learning gained by measuring systemic change in a particular intervention where they introduced an 'innovation' into the market. It highlights the different challenges to measurement the program faced, and how it set about dealing with those challenges. Most importantly, the case demonstrates that there is no 'perfect' solution for addressing challenges in measuring systemic change. Each program needs to find its own creative solutions, utilizing the best of its abilities and resources.

2 Introduction to GEMS1

[GEMS1](#) is part of the [GEMS](#) Programme in Nigeria, which aims to increase growth and employment by improving competitiveness in strategically important industry clusters in selected states as well as nationally.⁴ GEMS1 is funded by UKaid and managed and implemented by [The Palladium Group](#) (formerly GRM International). It is a five-year program that started in 2010 and has a total budget of 8.8 million British pounds. GEMS1 aims to create positive change in the incomes of 100,000 people (including poor men and women) and generate a total of £24.7 million additional income in the meat and leather industry.



GEMS1 uses the Making Markets Work Better for the Poor (M4P) approach, targeting sustainable improvements in markets. It specifically focuses on poverty-stricken states in northern Nigeria. The program's current portfolio consists of interventions in the areas of feed-finishing, meat-processing, finished leather, finished leather goods, skin quality, Business Membership Organization (BMO) development and advocacy, and access to finance. To learn more about GEMS1's achievements, view this [PowerPoint presentation](#).

⁴ All pictures throughout the case are from the GEMS1 website: <http://gemsnigeria.com/gems-1/>

3 Introduction to the Feed Finishing Intervention

The livestock industry in Nigeria has been growing, but it is still unable to meet domestic demand for red meat.⁵ Red meat prices have increased sharply over the last ten years. Yet there is a shortage of supply and the meat industry relies on imports. In Kaduna and Kano states, close to a million rural households keep livestock. However, livestock productivity is low for the following reasons:



- Livestock is slaughtered at a relatively old age. Therefore, animals are fed for a long period, increasing feeding costs, while they gain relatively limited additional weight.⁶
- Quality feeds and feed supplement aren't available in the market and farmers are not aware of their benefits or how to use them.
- Veterinary services are of poor quality so animals are more prone to diseases that affect productivity.

Other problems in the livestock market are as follows:

- Inconsistent supply because most farmers only sell livestock when they need the cash and during Sallah⁷ when the market price is usually very high.
- Price in the informal markets is based on the 'appearance' of the animal, rather than its exact weight. While a healthy, well-fed and young animal looks better, there is not a direct and linear relationship between the weight of an animal and the prices it fetches. Therefore, farmers have less inclination to give balanced feed supplement.



To increase animal productivity, GEMS1 designed an intervention to promote feed finishing⁸ by supporting feed companies to develop a balanced feed supplement and to create a new business model (See Figure 2).

⁵ Beef, lamb, goat and camel are the major types of red meat produced.

⁶ Feed to weight conversion rate decreases.

⁷ Sallah is a Muslim religious festival of sacrificing cattle and rams.

⁸ Feed Finishing refers to a short duration animal fattening technique using balanced feed supplement. The process involves feeding an animal with balanced feed supplement alongside other feed, as well as complimentary animal husbandry practices such as providing water throughout the day, deworming and providing veterinary services.

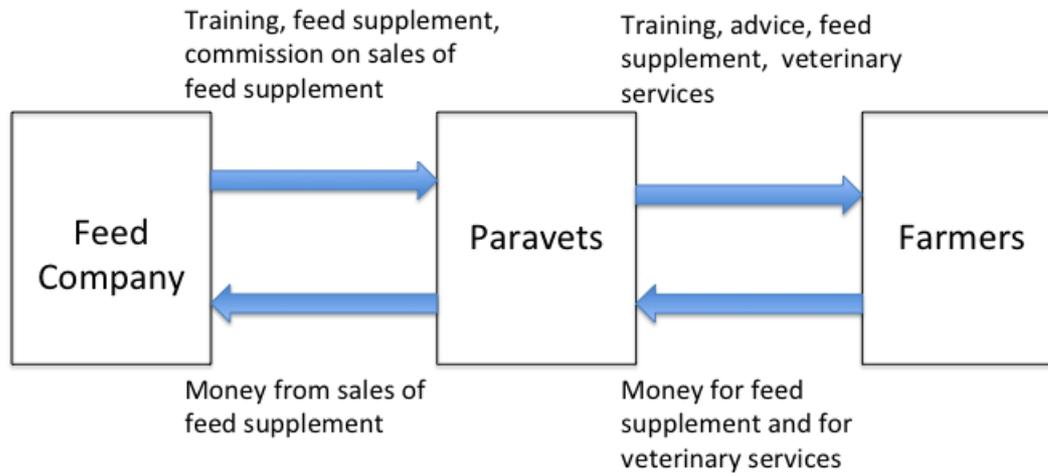


Figure 2: Innovative feed finishing business model

In this model, the feed companies contract paravets as their agents to promote and sell feed supplement to farmers. The paravets earn a commission on the sales of feed supplement. They mobilize communities for farmer training on the use of balanced feed (as well as complimentary animal husbandry practices) and provide them with veterinary services. The farmers buy feed supplement from the paravets and pay them for their veterinary services.



The logic of the intervention is that GEMS1 helps feed companies train paravets on using feed supplement and other good livestock management practices so the paravets can organize farmer training and pass on the same information. As a result, these farmers (referred to by GEMS1 as 'direct farmers') start giving their livestock feed supplement and applying good practices such as deworming, making drinking water available

throughout the day and night,⁹ and using veterinary services. The result is that the animals gain weight faster. Ultimately, it is expected that using balanced feed in livestock fattening will benefit farmers in the following ways:

- Reduced costs as the fattening stage will be shorter so farmers will need to provide feed for less time.
- Lower expenditure on other feed since less of other feed is required when feed supplement is used.¹⁰
- Higher prices for healthier-looking animals.

These three changes will lead to farmers increasing their profits from raising livestock.

⁹ Traditionally, farmers would only give water once or twice to their animals (during daytime). They believed that giving an animal water at night would make it sick, which is not true.

¹⁰ GEMS1 research shows that expenditure on feed (including the supplement) is approximately half when practicing feed finishing as compared to traditional livestock fattening practices.

It is expected that if partner companies make profits on sales of supplement, other companies will be encouraged by their success and start producing feed supplement as well. They will crowd-in to the market by adopting the business practices of partner companies.



Also, once direct farmers start earning higher profits, other farmers (referred to as ‘copy farmers’) will copy their practices and give their livestock feed supplement as well. These might buy feed supplement produced by GEMS1-supported companies or produced by new companies that crowd-in to the market. Figure 3 shows the simplified results chain for this intervention. Click [here](#) to see the more detailed results chain used by GEMS1.

In 2011, GEMS1 conducted a pilot with a company to develop a formula for the feed supplement and test its effectiveness on animals’ productivity or, more specifically, average daily weight gain of cattle and rams. After the pilot demonstrated that the use of feed supplement significantly helped livestock to gain weight, GEMS1 partnered with seven companies in Kano and Kaduna that were interested in selling feed supplement commercially. Eventually, two of the seven showed an interest in large-scale expansion of their feed supplement business. In 2013, GEMS1 partnered with them to scale up the intervention in Kano and Kaduna and replicate the model in three other states (Jigawa, Zamfara and Katsina) in 2014.

This intervention is particularly important for GEMS1 because, after the pilot, the program realized that the impact could be very large. The social structures in northern Nigeria promote copying of successful farm practices and GEMS1 expected that a significant number of farmers would copy the early adopters. Furthermore, GEMS1 also expected that other companies would copy the practices of the partner companies and enter the feed supplement market. Finally, the work in livestock fattening was expected to lead to additional benefits in meat processing and the leather sector where GEMS1 also works. It therefore became very important for GEMS1 to rigorously measure the impact of the intervention.



Alhaji Musa...

“I am finishing 4 rams for Christmas. I learnt about it from my neighbour Ahmed Sani who is finishing rams for Salah. I expect to make at least twice as much than from fattening. After selling, I plan to buy some younger cattle for finishing as there is more money to be made.”

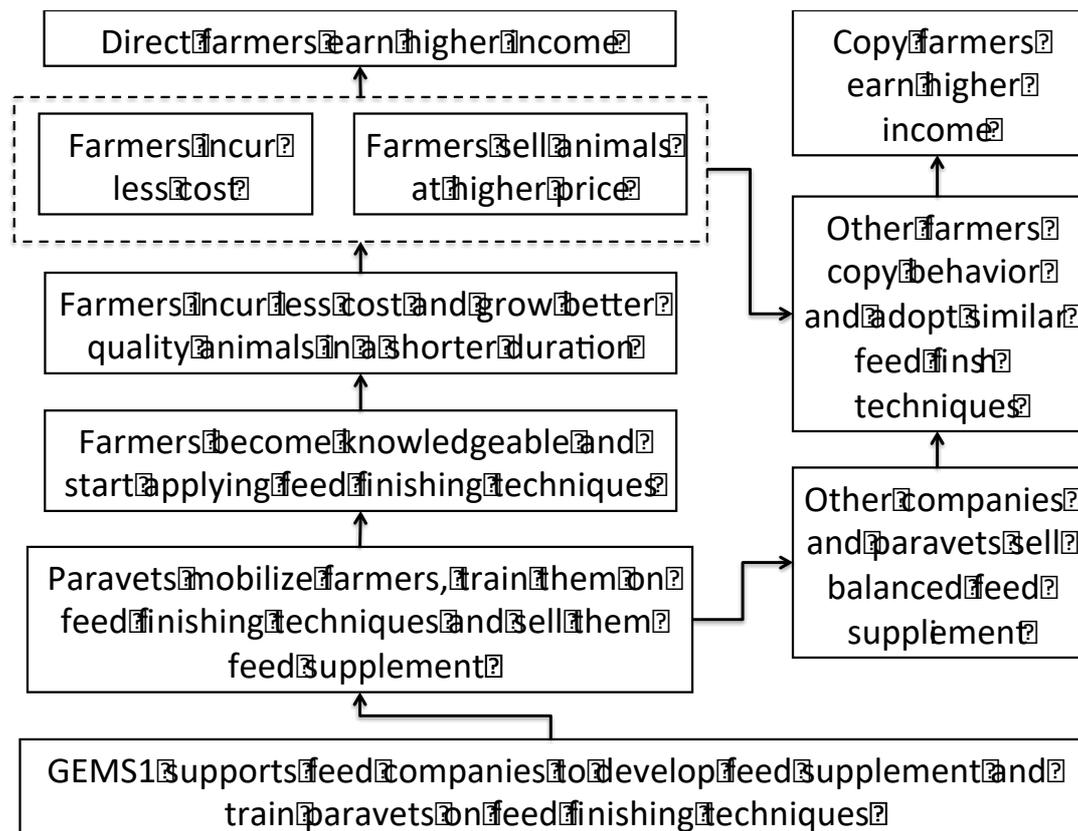


Figure 3 Simplified results chain

4 Challenges in Measuring Change in the Intervention

There were several challenges in measuring the results of this intervention with respect to measuring both direct impact as well as impact due to systemic change.

- Several behaviour changes expected:** Proper feed finishing technique not only requires the use of feed supplement but also a) deworming the animal, b) ensuring it has water available throughout the day and night, c) ensuring the animal is periodically checked by a veterinary service provider and d) regularly feeding the animal crop-waste. This meant that the measurement of the intervention had to examine behavioural change for five practices (including the use of supplement). Copy farmers benefit by copying the practices of direct farmers. With five practices to copy, it was likely that these farmers would only copy some of the complementary practices along with using feed supplement.
- No standard baseline for feeding practices:** There was no standard practice in traditional animal fattening. Farmers used a number of different feeds (homemade and store-bought) over varying periods. Complementary practices also varied.
- Price dependent on the appearance of the animal and not directly on weight:** In traditional markets, prices are not fixed and animals are sold based on the perception of the buyer and the negotiation skills of seller and buyer. Generally, a feed-finished animal with good weight gain will be perceived as superior to a traditionally raised animal. However, a feed-finished animal that had higher average daily weight gain and a better quality of meat might still fetch a lower price than a poorer quality animal raised on traditional practice based on some buyers' perceptions.

- **Lack of researchers:** There is a lack of quality researchers in northern Nigeria. As a result, GEMS1 had to extensively train agricultural extension officers to conduct research and monitor them closely throughout data collection. This led to the research becoming very costly.
- **Security threats:** Since early 2012, the GEMS1-targeted northern states of Nigeria (Kano, Kaduna, Jigawa, Zamfara and Katsina) have become susceptible to security lapses due to insurgencies. Monitoring and results measurement activities have become more challenging because staff need to adhere to strict security advice. For example, monitoring has not been possible in Kaduna since 2013.
- **Business culture:** In Nigeria, businesses tend to be reluctant to share information. So even when market intelligence indicated that other companies crowded-in to the market, probably as a result of the GEMS1 intervention, it was difficult to get any information from the new entrants on why they started or about their sales and earnings.

5 Solutions for Measurement Challenges

This section describes the solutions that GEMS1 developed to address various measurement problems related to assessing systemic change and the impacts of systemic change.

5.1 Challenge 1: Defining direct and indirect farmers

Context: This particular intervention was trying to have an impact on traditional farmers who were not using any set or consistent practice for feeding their livestock. In traditional practice, farmers give their animals different kinds of homemade or purchased feed. They keep their animals for varying time periods, ranging from a few months to one and a half years for sheep and goats, or several years for cattle. Also, to get maximum impact out of giving feed supplement, farmers need to practice the other four feed finishing techniques discussed in section three. These were all practices that some traditional farmers applied partially and others not at all.

While the four practices, along with the use of feed supplement, were promoted through the intervention, GEMS1 didn't expect that farmers would start applying all the practices. It was expected that different farmers would apply different combinations of the practices along with giving their animal feed supplement. Under these circumstances, it was important to establish a clear definition of a direct and of an indirect farmer to help measure direct and indirect outreach. For example, if a farmer only gave feed supplement but did not practice any of the other techniques, could he be counted as being impacted by the intervention?

Solution: In order to set parameters on what to look for in direct and indirect farmers, GEMS1 carefully defined the two, as follows:

- A **direct farmer** is one who received information on feed finishing from paravets trained in the intervention and fattened his/her animals for a short period using feed supplement made by GEMS1 supported companies. He/she should also have adopted at least two other animal husbandry practices out of the four taught by the paravets.
- An **indirect farmer** is one who has copied the practice of giving feed supplement from direct farmers and has not received training from a paravet connected to one of the supported companies. He/she fattened his/her animal for a short time using

balanced feed supplement. He/she should also have adopted at least one of the other animal husbandry practices promoted by the intervention.

GEMS1 chose one practice change for indirect farmers as opposed to two for direct farmers because indirect farmers are only copying practices of direct farmers. They don't receive training from the paravets and will therefore be more lightly affected by the intervention.

Learning: There needs to be a clear and consistent definition of direct and indirect beneficiaries so that they can be easily identified during measurement. If interventions are new, programs can do a small pre-test study to identify potential beneficiaries and collect information on their practices so as to define their behaviour and type.

5.2 Challenge 2: Assessing results in a data-poor environment

Context: As explained above, there were several challenges, which made the measurement of impact complicated. The intervention itself was complex as it was an innovation and promoted various behaviour changes. There was a lack of good researchers who could conduct the assessments and the security situation was volatile, which often meant assessments could not be conducted as scheduled. It was important for GEMS1 to assess the intervention as well as possible, as it was an important one for the program, with significant potential for outreach.

Solution: To address the challenges, GEMS1 used several methods of measurement so that findings could be checked and triangulated against each other. Measurement was started in the pilot phase to see how the intervention worked and how feed supplement impacted animal growth. When the intervention was scaled up, GEMS1 repeated measurement a few times and gathered information from different sources: partner feed companies, other feed companies, paravets, direct farmers, copy farmers and government records. Information could therefore be cross-checked during analysis. Table 1 summarizes the different tools used to assess results.

Table 1: GEMS1 Feed Finishing Measurements

Direct Results		Indirect Results	
Key Change	Measurement tool and technique	Key Change	Measurement tool and technique
<ul style="list-style-type: none"> • Training of paravets • Training of farmers 	<ul style="list-style-type: none"> • Pre and post training assessment of paravets to gauge what they learnt from training and knowledge on feed finishing • Interviewing of farmers to understand what they learnt from training, estimate knowledge on feed finishing • Monitoring the training via field observation and collecting of participant lists 	N/A	N/A
<ul style="list-style-type: none"> • Paravets mobilize farmers and provide training on feed finishing • Paravets sell feed supplement to farmers 	<ul style="list-style-type: none"> • On-going field level monitoring of paravets by GEMS1 team to check if they were mobilising farmers and giving information on feed finishing • Case study on paravets to assess their behaviour change as a results of the intervention 	N/A	N/A
<ul style="list-style-type: none"> • Farmers buy feed supplement 	<ul style="list-style-type: none"> • Periodic check with partner feed companies to understand how business has changed as a result of the intervention and gather data on sales 	<ul style="list-style-type: none"> • Other feed companies produce and sell ruminant feed supplement 	<ul style="list-style-type: none"> • Investigative research to identify other feed companies that entered the feed supplement market • Follow up interviews with these other feed companies to understand why they invested in balanced feed supplement, who they are selling to and volume of sales (if they were willing to share). • Gathering of information from the government's Growth Enhancement Scheme (GES), which

Direct Results		Indirect Results	
Key Change	Measurement tool and technique	Key Change	Measurement tool and technique
			provides inputs to farmers (including feed supplement) ¹¹ at subsidized prices, on the number of companies supplying feed supplement.
<ul style="list-style-type: none"> • Farmers use feed finishing techniques including feeding animals balanced feed supplement • Farmers sell feed finished animals at higher price and/or lower cost 	<ul style="list-style-type: none"> • Baseline study of farmers • Impact assessment of trained farmers compared to other farmers to see if they use the five feed finishing techniques, to what extent they experience the expected enterprise changes, and their profits 	<ul style="list-style-type: none"> • Copy farmers use feed finishing techniques • Copy farmers sell feed finished animals at higher price and/or lower cost 	<ul style="list-style-type: none"> • Direct farmers interviewed to identify potential copy farmers • Impact assessment of copy farmers to see whether they copied direct farmers and used the five feed finishing techniques, to what extent they experienced the expected enterprise changes, and their profits compared with other farmers
<ul style="list-style-type: none"> • Farmers make additional income • Number of farmers with increased profit 	<ul style="list-style-type: none"> • Number of farmers estimated by calculating how many benefit compared with a comparison group. • Increased profit estimated by calculating how much additional profit farmers make compared with a comparison group 	<ul style="list-style-type: none"> • Copy farmers make additional income • Number of copy farmers with increased profit 	<ul style="list-style-type: none"> • Number of copy farmers estimated by applying the ratio of copy farmers that benefit per direct farmer • Increased profit estimated by calculating how much additional profit copy farmers make compared with a comparison group

¹¹ GEMS1 lobbied with government to include providing balanced feed supplement at a subsidised price to farmers in poor zones under the GES scheme.

Table 2 lists the different assessments that were done over time and the purpose of each.

Table 2 List of different assessments

Type of assessment/info	Purpose	When collected	Sample size
Outreach - training and company sales	To monitor outreach to farmers, cross-checking training participation lists against data from partner companies on feed sales	Quarterly/ Annually	N/A
1 st Baseline (for scale up intervention)	To understand traditional fattening practices and measure the income	2013	62
1 st Impact assessment	To assess if farmers practiced feed finishing and measure the income gains	2013	200
Copy farmer assessment	To assess if potential copy farmers practiced feed finishing and measure the income gains	2014	55
Comparison group study	To identify changes in income over time for traditional farmers so that findings can be used to estimate attributable income for beneficiaries	2015	50
2 nd Impact assessment	To check for sustainability of practice change and benefits. To determine whether direct farmers continued to practice feed finishing and gain additional income	2015	70
Crowding-in	To check whether other feed companies started to offer feed supplement due to the intervention	2013-2015	N/A

Learning: For complex interventions, it is important to use different forms of measurement to understand the 'complete picture' of results. Repeating studies over time also helps to establish whether change is consistent over time and sustainable for beneficiaries.

5.3 Challenge 3: Assessing if other companies crowd-in

Context: Before the GEMS1 intervention, there were no companies producing feed supplement specially formulated for fattening ruminants in the livestock market. Yet it was difficult for GEMS1 to assess how many companies crowded-in as a result of seeing the success of the GEMS1-supported companies because GEMS1 did not have links with other companies. Nigeria is a big country. It is difficult to track if other companies start producing feed supplement, and, for those that are identified, why they started and how much they sell.

Solution: In order to assess crowding-in, GEMS 1 took an investigative approach to determine whether other new companies had started making and selling feed supplement for ruminant fattening. The whole team, including intervention managers, implementation staff and Monitoring and Results Measurement staff, was encouraged to take an active role in gathering this information to ensure wider collection of data. Once GEMS1 identified potential companies that might have crowded-in (i.e. those that had entered the feed supplement market after the GEMS1 intervention), GEMS1 contacted them to see if they

started as a result of learning about the GEMS1 supported companies or for other reasons. This inquiry helped to assess if there was credible attribution to the intervention. As explained in section three, companies tend to be reluctant to share data, so a practical but credible approach was required.

In order to assess whether other companies had also started producing feed supplement, GEMS1 took the following steps.

- 1) GEMS1 collected information from their two partner companies, other companies they had previously worked with, paravets, agrovets and farmers to identify other companies that had entered the feed supplement business after the GEMS1 intervention.
- 2) Once other companies were identified, GEMS1 interviewed them in order to understand their business practices (who they were selling to, what volume of sales they were making) and whether they had started producing feed supplement as a result of the GEMS1 intervention.
- 3) GEMS1 collected information from the government's Growth Enhancement Scheme to determine the number of companies supplying feed supplement to the GES so as to triangulate findings from the above two steps.

GEMS1 focused on whether companies were entering the feed supplement market, as sufficient supply is essential to achieving significant outreach to farmers. Ideally, GEMS1 would also have gathered information about the business models the other companies were using to educate farmers and encourage the use of feed supplement. However, given the challenges in getting information, this was not a focus.

Learning: Assessing crowding-in requires identifying companies that copied the business practices of the companies with which the program partnered. It is useful to take a journalistic approach, investigating leads and gathering information from multiple sources to build as complete a picture as possible of what change is occurring and why it is occurring.

5.4 Challenge 4: Assessing the results of crowding-in

Context: Once GEMS1 had identified companies that crowded-in, the program aimed to understand the results of crowding-in. However, as companies were reluctant to share trade information, it was difficult to establish the impact of these businesses in the feed supplement market.

Solution: GEMS1 interviewed the companies identified as likely to have crowded-in to find out the nature of their business and get information on their business performance. It was sometimes difficult to get this information. Some companies, however, shared their sales data, which was used to understand how many farmers the company was likely to be reaching. It would have been ideal if GEMS1 could have followed up this sales information to identify indirect farmers (i.e. farmers who are buying feed supplement that is made by companies who have crowded-in). However, as GEMS1 only had access to limited information, it was not possible for them to trace indirect farmers via the companies.

Learning: Businesses can be reluctant to share data. It is important to be creative when it comes to collecting information from them. For example, instead of asking for sales figures, programs can ask for an approximation of their market share. Programs should be pragmatic in data collection and accept that it might not always be possible to get very specific trade information from companies (particularly those who aren't partners). In such cases, other ways of identifying indirect farmers need to be used, for instance finding them through

direct farmers and/or service providers (paravets in this case) or estimating the number of indirect farmers by checking on the diffusion of the innovation in the market, using both primary and secondary sources when possible.

5.5 Challenge 5: Identifying indirect farmers

Context: As mentioned in challenge four, it proved difficult for GEMS1 to identify indirect farmers being serviced by companies that crowded-in as a result of their intervention since most companies were reluctant to provide information on their businesses. Thus GEMS1 had to use other means to identify indirect farmers.

Solution: GEMS1 decided to identify indirect farmers by getting information from direct farmers. When direct farmers were interviewed, a section of the questionnaire gathered information on other farmers they thought had probably copied their new practices. It specifically asked the direct farmers whether they knew of any other farmers who had copied their behaviour (caused as a result of the intervention), and if so, to provide the number of copiers and their contact details. (Click [here](#) to see the questionnaire.) The questionnaire allowed farmers to identify and give details of up to five copy farmers.¹² GEMS1 made a list of potential copy farmers based on the responses.

GEMS1 then took a random sample from the list (by selecting every 7th potential copy farmer from the list) for interview. If the selected farmer was not found, the enumerator was instructed to pick the next farmer on the list and then continue with the random selection. GEMS1 surveyed the sample of potential copy farmers to assess whether they copied the direct farmers or changed for other reasons.

Two hundred direct farmers were interviewed in the impact assessment of 2013 and 172 (86%) of them identified a total of 408 potential copy farmers. All the names and telephone numbers on the list were checked against each other to eliminate overlap. GEMS1 found that there were no overlaps, possibly because the program had spread sampling of respondents across different villages and districts. However, if GEMS1 had applied a more intensive sampling,¹³ overlaps might have been identified.

Out of the 408 potential copy farmers, 55 were randomly selected for copy farmers' impact assessment. To confirm if they were indeed copy farmers, GEMS1 took two steps.

1. **Checking whether they indeed copied direct farmers:** The potential copy farmers were asked why they started using feed supplement, how they learnt about it and from whom. (Click [here](#) to see the questionnaire.) Their names were also checked against the list of feed finishing training participants to ensure they were not trained farmers. They were also asked whether they had received any information from the feed company and the paravets, as paravets could also have influenced copy farmers.
2. **Checking what behaviours they copied:** The potential copy farmers were asked what behavioural changes they had adopted from direct farmers. As noted above,

¹² The questionnaire asked the direct farmers to name a maximum of five indirect farmers because previous experience showed that the copy ratio was always lower than that. Also, asking for more than five names would have made the interviews too long and unmanageable.

¹³ GEMS1 spread the sample respondents across different villages to ensure it got representation from different areas in which it worked. However if the sample had been more geographically concentrated there might have been more overlap.

GEMS1 only counted those who used feed supplement and practiced at least one of the other four recommended practices.

The findings from the two studies (direct and indirect) led GEMS1 to estimate that at least 86% of direct farmers will influence a further 2 farmers to copy the practice of using feed supplement and at least one other recommended practice.

Learning: Talking to direct beneficiaries is a good way to identify potential indirect beneficiaries. Afterwards, they have to be confirmed as indirect beneficiaries by questioning them on how and why they made changes. Gathering qualitative information is key to understanding whether the changes made by indirect beneficiaries can be credibly attributed to the intervention. It is also important to keep in mind that there is a risk of potential overlaps regarding indirect beneficiaries, as more than one direct beneficiary might affect the same indirect beneficiary. If that is the case, a method should be developed to estimate and correct for overlaps.

5.6 Challenge 6: Measuring benefits for indirect farmers

Context: After copy farmers had been identified, GEMS1 needed to assess the benefits they gained from copying direct farmers. Sometimes programs assume that indirect beneficiaries will benefit to the same extent as direct beneficiaries. However, indirect beneficiaries often gain less benefit because they change their behaviour to a lesser degree or have less support than direct beneficiaries. Indeed, GEMS1 had already defined copy farmers differently from direct farmers, acknowledging that they were likely to change fewer practices since they had not received training from the paravets. This definition implied that they might benefit differently from direct farmers.

Solution: GEMS1 did a separate assessment on copy farmers to measure the attributable change for them, instead of assuming that they would get the same impact as direct farmers. The program used the same methodology that was used for measuring attributable change for direct farmers. The copy farmer study is summarized below.

1. A survey was conducted with 55 of the copy farmers identified (mentioned above) to collect information on their practices (use of supplement, use of other practices) and on the results (time taken to fatten an animal, total cost incurred, revenues and profit/loss made).
2. Comparison of the data above with the data from a group of similar farmers using traditional livestock raising practices.¹⁴ GEMS1 estimated the impact on the copy farmers as the difference between them and the comparison group. Ideally, GEMS1 would also have compared the data from the comparison group with baseline data on the copy farmers to confirm that they were similar. However, GEMS1 relied instead on paravets to confirm the similarities between the two groups of farmers on key criteria such as their geographical location and the number of animals they raised. GEMS1 also examined the data from the two groups to assess the variance within and between the groups. They found that the difference between the two groups was larger than the variance within each group. This finding adds weight to

¹⁴ This methodology and the same comparison group were also used to estimate the attributable impacts for direct farmers.

the assumption that the comparison group was ‘similar enough’ to the copy farmer group to approximate the counterfactual.¹⁵

Learning: It is important to recognize that direct and indirect beneficiaries may not benefit to the same degree. Therefore the benefits for each should be measured separately.

6 The Benefits of Measuring Systemic Change

GEMS1 promoted the introduction of a new product – feed supplement- and better practices to improve the livestock market for the benefit of small-scale farmers. In order for the intervention to achieve significant scale, it was important for other companies to crowd-in and more farmers to use the new product and copy the improved practices. The approach GEMS1 used to assess systemic change and its benefits provided the program with important information on the extent to which the product was gaining momentum in the market and whether that was likely to benefit increasing numbers of farmers over the long term.

Data showed that farmers were benefitting significantly from using feed supplement (even with greatly fluctuating prices) as they managed to reduce fattening costs and were able to do multiple cycles of feed finishing. These benefits not only accrued to direct farmers but to copy farmers as well. The methodology of collecting impact data at two points in time and triangulating with information from other sources provided GEMS1 with firm evidence that the benefits to farmers will be sustained over time. Collecting information on crowding-in and copying enabled GEMS1 to conclude that the benefits will probably increase over time as more and more farmers buy and use feed supplement.

The findings from the first couple of years informed a revision and expansion of the feed finishing intervention to additional states in northern Nigeria. The detailed approach to understanding systemic change also helped GEMS1 to understand the whole livestock market better. Using the findings on the feed finishing intervention, GEMS1 designed a new intervention to link farmers who had feed finished young animals to feedlot enterprises. This intervention provided feed finishing farmers with access to a reliable market with higher prices.

Overall, GEMS1 found the information gained through measurement of the direct impacts, systemic changes and indirect impacts of the feed finishing intervention useful not only for developing that intervention but also as input for the program’s overall strategy in the meat and leather sectors.



Hajiya Habiba

“Ram fattening once yearly for Salah took me over 5 months. Finishing with feed concentrate takes just 50 days. Now I can do this 3 times a year!”

¹⁵ For more guidance on using a comparison group to assess attribution, see “Measuring Attribution – The cases of ALCP in Georgia, MDF in East Timor, PropCom Mai-Karfi in Nigeria and Samarth-NMDP in Nepal” H. Posthumus and P. Wanitphon, DCED, 2015.

Annexes

1. [PowerPoint presentation on GEMS1 achievements](#)
2. [GEMS1 example results chain for feed finishing](#)
3. [Direct farmer questionnaire](#)
4. [Indirect farmer questionnaire](#)