

Full Length Research Paper

Impact monitoring and evaluation system for farmer field schools in Kyrgyzstan: How to optimize resource allocation for higher impact

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With the collapse of the Soviet Union, Kyrgyz agriculture went through deep structural changes and the new small subsistence farmers were poorly prepared, lacking technical knowledge and entrepreneurship. Pilot activities demonstrated that integrated pest management (IPM) as a topic for Farmer Field Schools (FFS) could effectively fill the gap in extension services and enable farmers to become more efficient and self-reliant managers of their scarce agricultural resources. The objective of this study was to develop an impact monitoring and evaluation system (IMES) to measure the effectiveness of FFS in terms of resources allocation, participation, outcome and impact, for partner-organisations and potential FFS-participants, taking into account the Kyrgyz context and the particular framework of IPM FFS. As farmers can best define indicators reflecting their livelihood situation and rating scales realistic to their specific condition, a participatory monitoring and Evaluation (M&E) within the FFS-group and a longitudinal (before/after) comparison was proposed. A spider diagram was used as a framework to visualize quantitative, rated core indicators, which were the basis of the qualitative questioning on reasons for changes, making it possible to attribute certain impacts to FFS-trainings. The generated feedback and self-reflection additionally motivates and empowers participants, an effect highly appreciated by the FFS approach.

Key words: Monitoring, outcome evaluation, farmer field schools, Kyrgyzstan.

INTRODUCTION

With the collapse of the Soviet Union and the independence of the Kyrgyz republic in 1991, Kyrgyz agriculture went through deep structural changes, from large collective farms to household-scaled semi-subsistence farms. Former kolkhoz and sovkhoz specialists became small-scale farm-generalists with a huge lack of technical knowledge and entrepreneurship. Those new farmers were poorly prepared and yields of various crops decreased dramatically. Besides a lack of inputs, they were particularly in need of training which would give them the knowledge and confidence to make their own proper decisions (Eveleens, 2004). Figure 1 shows a problem tree with the main challenges faced by Kyrgyz farmers. From 2003 to 2005, pilot activities were

carried out to test the suitability of season-long integrated pest management (IPM) trainings in cotton, potato, cucumber, and tomato production using the farmer field school (FFS) model. The Advisory Training Centre (ATC)¹ was responsible for the implementation. The FFS approach struck a responsive chord with farmers and other stakeholders. The pilot activities demonstrated that FFS could effectively fill the gap in extension services and enable farmers to become more efficient and self-reliant managers of their scarce agricultural resources. The FFS approach had the potential to provide farmers with the practical knowledge and skills to operate more effectively in a market-oriented agricultural system and to enable optimum utilization of services offered by private providers (FAO, 2006). In the period of 2003 to 2006, 174

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¹ ATC (advisory training centre) was renamed ZOKI (Training, Advisory and Innovation Centre) in 2008. It is located in Bishkek, Kyrgyzstan

farmer field schools were conducted in Kyrgyzstan and altogether approximately 2600 farmers were trained (Eveleens, 2007). Since 2006, the IPM farmer field school approach in Kyrgyzstan is no longer in the pilot phase. There is a need to prove its effectiveness in improving farmers' livelihoods as an outcome of the FFS. Outcome monitoring allows the regular reporting of program results in ways that stakeholders can use to understand and judge those results. The existing monitoring system of the Integrated Pest Management program in Kyrgyzstan focuses mainly on results and outputs. However, there is a big demand for more detailed information on short, mid and long-term outcomes and impacts to optimize processes and the use of resources.

Purpose of the study

The purpose of this study was to develop an Impact monitoring and evaluation system (IMES), that would allow the measurement of the effectiveness of the FFS-approach in Kyrgyzstan with the aim to attract new donors, partner-organisations and potential FFS participants, and answer the following key questions in order to optimise processes, resource allocation and make necessary strategic adjustments to assure that program objectives are met within the changing context:

- a) How far do farmers use the newly gained skills, and do those allow them to increase income and improve their livelihood situations?
- b) Do partner organizations continue to implement Farmer Field Schools and improve trainers' skills on their own, after ATC has withdrawn their direct support?

Great emphasis was put on taking into account the specific conditions prevailing in Kyrgyzstan and the particular framework of IPM Farmer Field Schools. This means that the impact evaluation must not only be placed in a broader perspective, observing beside the economic benefits, the ecological and human-social benefits, but at the same time be easily understandable and if possible usable as part of the curriculum of the FFS, as farmers can best define indicators reflecting their livelihood situation and rating scales realistic to their specific condition. Moreover is a self-reflecting, empowering approach an important principle of FFS.

METHODOLOGY

The methods applied in this study include literature review especially focusing on monitoring and evaluation methods used for FFS, outcome and impact assessment, participatory approaches, as well as field work: A total of 32 FFS-participants, 15 trainers, 4 master trainers, and 8 partner organizations were involved in the study. The interviews and questionnaires were conducted in

Batken-, Chui-, Jalalabad-, Naryn-, Osh-, and Issik-Kul-Oblast between July and August, 2007. Each FFS group had on average 12 to 15 participants. Questionnaires and semi-structured interviews were used to assess their opinion, preferences, satisfaction, bottlenecks and potentials, concerning the IPM Farmer Field School approach in order to assess the research hypotheses (Müller, 2007).

RESULTS

M&E of FFS in the literature

There is a wide variety of tools and techniques for M&E discussed in literature and described in a number of manuals and guidebooks to choose from. Van den Berg (2004) rationalizes that local processes and structural changes triggered by IPM Farmer Field Schools are best described in open-ended qualitative studies (e.g. case studies, photo reportage, non-structured interviews, and participant observation). However, monitoring of IPM FFS is still mainly done by structured questionnaires and only in a few cases by semi-structured interviews and questionnaires, group discussions and field visits.

According to Estrella and Gaventa (1998) PRA techniques, also known as "Participatory Rural Appraisal" or "Participatory Rapid Assessment" comprise, a range of visualization, interviewing and group work methods, proven valuable in enabling people to express their views and share information, in uncovering their realities and priorities, and in stimulating discussion and analysis. One method, called participatory spider (web) or kite diagramming, used by Mancini et al. (2006) evaluating cotton IPM FFS outcomes using the sustainable livelihoods approach (SLA) in India, leaped to the author's eye. The method as such is not new. Herweg and Steiner (2002), as well as the RISE (Response-Inducing Sustainability Evaluation) system developed by the Swiss College of Agriculture use this type of diagram to visualize and communicate results. Mancini et al. (2006) however, use the spider diagram already to collect data, giving stakeholders a visual aid, to which participants can readily relate to and understand because it is a picture of results. The same authors going even further, allowing farmers – as defined by the SLA approach – free choice of indicators most important to them, and discussing reasons for those changes.

Outcome and impact indicators

Impact indicators were selected on the basis of the impact hypotheses, derived from the problem tree (Figure 1), influenced by stakeholders' opinions and lessons learnt from previous years. The impact hypotheses in this case are somehow like "pathways towards improved livelihood". An exemplary core set of outcome / impact indicators with reasons for its choice and source of

PROBLEM TREE

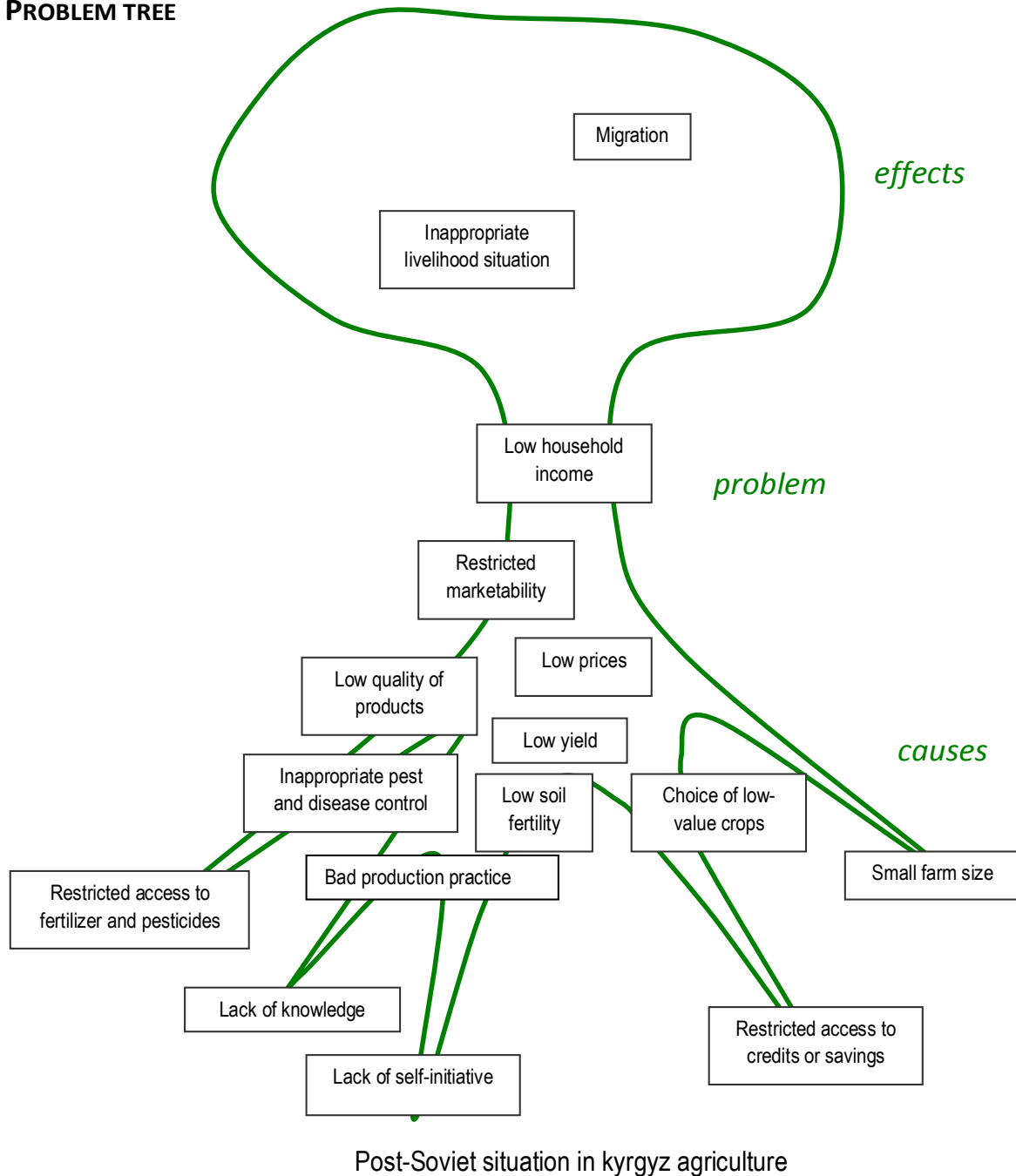


Figure 1. Problem tree summarizing problems identified by farmers.

verification is listed below in Table 1. They are put here as an example only and must be cross-checked by a group of different stakeholders, to adjust them to their situation, their value system and the specific crop.

Indicators need to be measurable, possible to estimate or observe. Given the prevailing Kyrgyz situation, where farmers do not document production cost and yield at all, or do not want to share information, collecting this information was challenging. Farmers were indirectly

asked for numbers e.g. whether their household income has decreased, stagnated or increased. This data gives a good general impression about the development of the livelihood situation and creates a basis for further qualitative questioning. On this point, farmers might attribute a higher income to the increased yield, expansion of cropping area, lower production costs, a family member who participated in FFS and now found a better paid job, or many other things not related with the

Table 1. Exemplary core set of outcome / impact indicators.

	Outcome / impact indicator	The selected indicators (left) relate to the following issues	Source of verification
	Crop yield (tomato)	Soil fertility Productivity Production practice	Measure or estimate by the farmers, invoices of processing companies
	Area under specific crop (tomato)	Profitability Meeting market needs	Interviewing farmers (as farmers do not keep accounts)
Economic	Yield quality (tomato)	Production practice Price potential	Farmers' statements, field visits
	Marketing of products	Risk reduction; Potential for production increase	Interviewing farmers
	Household income	General development of the livelihood situation Basis for later qualitative information about reasons	Estimate by the farmers
	Inputs used	Adoption of IPM technology Cropping practice	Interviewing farmers with checklist
Ecological	Number of marketed crops (crop diversity)	Increase of biodiversity Risk reduction Sign of innovation	Interviewing farmers, using list of products as support
	Group development	Risk reduction Farmer-to-farmer extension Lower production costs due to lower input prices	Farmers, NGO implementing FFS, contracts
Human-social	Problem solving skills	Empowerment Self-initiative	Farmers, field visits
	Planning	Reliability of monitoring data Empowerment	Farmers

project. This information is needed as many indicators individually do not represent a change in household income or livelihood situation. Even if yield is increased, there is no guarantee that it is still profitable, because production costs have maybe increased as well. Production costs are hardly ever documented and it is really hard, if not impossible to evaluate the baseline data, when farmers are not trained in measuring samples and making estimates. Therefore another proxy indicator, like the area cultivated under the specific crop, might give an idea of profitability. If farmers do not earn more, it would not be attractive to them and they would rather reduce and not increase the production surface.

There are many possible indicators suitable to measure the outcome and impact of Kyrgyz farmer field schools. Which indicators are most appropriate to describe changes in the specific context, completing each other,

and allowing a certain triangulation, had to be elaborated by the stakeholders directly involved. An example of the above introduced core indicators (Table 1) is given in Table 2 where for each indicator, values were attributed on the basis of the survey results. Especially rating should be decided by farmers, as they are the only stakeholders sufficiently familiar with their context (tradition, village conditions, soil, pest and disease pressure, values, etc) to adjust them. Special attention should be put to the fact, that the highest scale often represents a value not reachable under the prevailing conditions. The value 5 (here the highest score) should represent an achievable result for the region and crop and not a value of a western country or reachable under conditions, not found in the context, where M&E takes place. Putting up targets too high is not only frustrating for people involved, but might also not lead to an

Table 2. Rating of impact indicators.

	Impact indicator	Rating				
		5 = very good	4 = good	3 = moderate	2 = weak	1 = very weak
Economic	Yield (tomato)	> 45 t/ha	30-45 t/ha	20-30 t/ha	15-20 t/ha	< 15 t/ha
	Surface ¹ (tomato)	> 100 sotkov ² =1 ha	50 – 100 sotkov	20 – 50 sotkov	2 – 20 sotkov	< 2 sotka (home consumption) or stopped producing
	Quality of Product (Tomato)	Good size, no visible damage (rotting, holes or spots)	Fruit worm holes or rotting patches rarely found	< 10% of fruits are damaged, patched or are undersized	10 – 30% of fruits are undersized or damaged (fruit worm, blossom-end rot, spots)	> 30% of yield is too small or heavy damaged to market
	Marketing of Product	Guaranteed market outlet (contracts), perhaps with on-farm processing	Oral agreements about price and quantity for the majority of yield	Agreement about price and quantity for small part or yield	Selling to market traders, being dependent on normal market fluctuation	Sell at the border of the street as this is the only possibility
	Household income	> 20% increase	10 – 20% increase	1 – 10% increase	Stagnating	Decreasing
Ecological	Inputs used	> 6 IPM techniques ³ are used in the field	5 - 6 IPM techniques are used in the field	3 - 4 IPM techniques are used in the field	1 – 2 IPM techniques are used in the field	No IPM technique is used in the field
	Number of marketed crops (crop diversity)	< 9	8-9	6-7	4 - 5	> 3
Human-social	Group development	Farmers form official or unofficial groups, cooperatives or network	Farmers marketing jointly their products or purchase of inputs	Farmers collaborate and exchange knowledge with members of the new group	Farmers collaborate mainly with members of their own family	Farmers work individually
	Problem-solving skills	Participates in participatory research or on-farm trials	Sets-up own small experiment	Asks neighbor or friend for advice	Tries things only where there are little problems	Does nothing
	Planning/ Documenting	Participants use a tech-chart ³ to plan and document main crops	Participants make cost-benefit calculations themselves	Participants note down yield and production costs	Participants measure yield or know volume from delivering to processing company	Participants have only a vague idea about yield

¹ Area per farm household (large farms are not represented in FFS); ² Pl. of sotka (сотка): old Soviet standard unit of measurement for private plots of land, "centihectare" = 100m²; ³IPM techniques trained can be listed and used to remember.

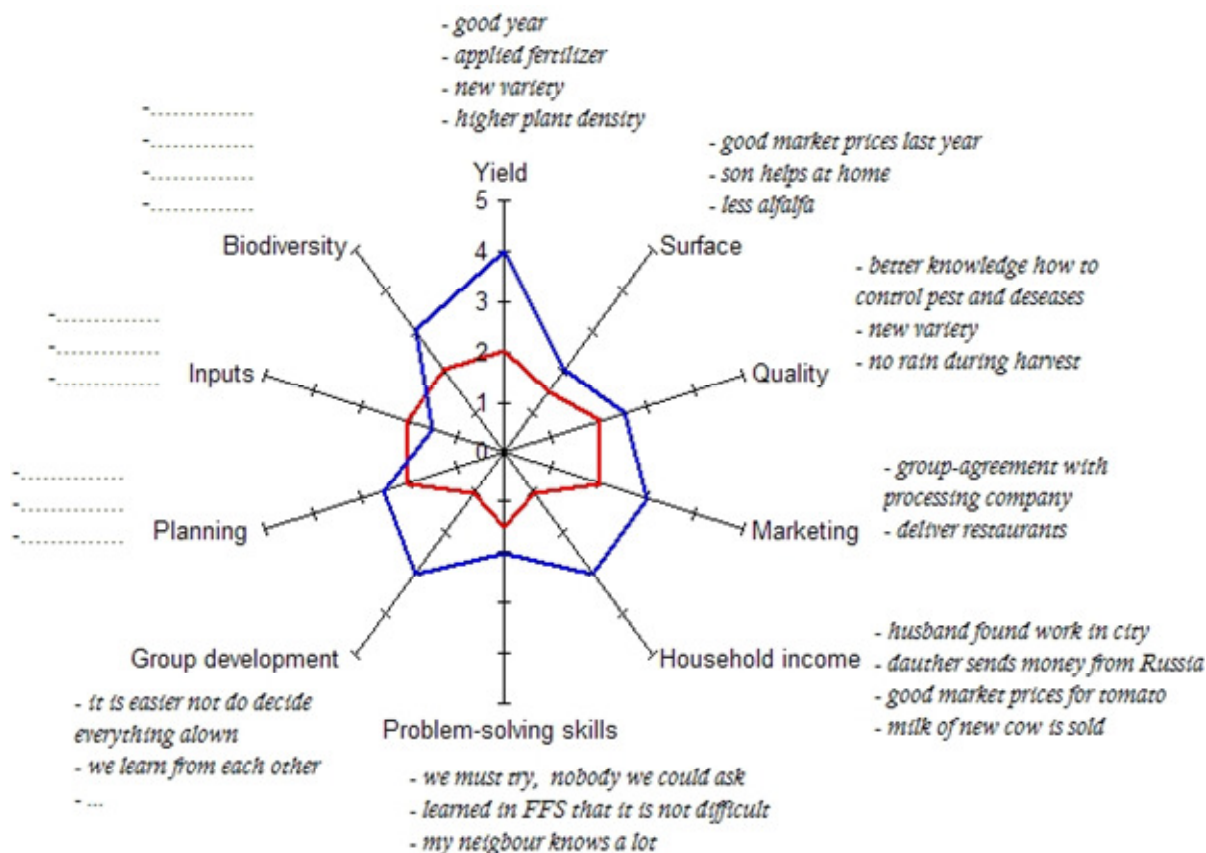


Figure 2. Spider-web graph applied to the Kyrgyz FFS IPM case.

evaluation result. Rating needs to be sufficiently sensible but also broad, being able to measure actual changes likely to happen, and not changes which are hoped for, without the necessary potentials given.

Once the indicators have been chosen, an appropriate monitoring tool must be chosen from a broad range of different methods or created to measure them. Gujit (1998) points out that choosing a method that is suitable and feasible, depends on factors such as the unit of analysis, whether qualitative or quantitative information is required, resources, etc.

A new method for M&E of FFS in Kyrgyzstan

Being easily understood by all stakeholders, enhancing their involvement, simple and cost-effective to implement and adapt to different crops, required a clear, uncomplicated, possibly visual tool. The diagram acts as kind of framework to visualize quantitative, rated core indicators, which are the basis for the qualitative questioning on reasons for changes noted beside and providing information why and how changes happened, making it possible to attribute certain impacts to the

projects interventions. The group-evaluation is therefore facilitated by a FFS-trainer or external monitoring consultant, moderating farmers' findings. Before or at the beginning of the FFS-training, baseline data will be collected. At the end of the first year's training and two years after trainings has ended, the indicators will be measured again and results will be checked against the baseline data. Reasons for changes are then jointly discussed and noted beside the indicators (Figure 2).

A first evaluation takes place during the monitoring itself and findings are directly fed back from the group to the individual farmer. Joining data from groups with similar conditions or crops has to be done by a master trainer or project staff of ATC, who also have to do the final interpretation and decision making how to adjust the program, if necessary, or use the data for the attraction of future FFS-participants, partner organizations and donors.

DISCUSSION

The method proposed allows FFS groups to follow up their own progress, assuming that a baseline study is

done at an early stage (e.g. at the beginning of the FFS) and repeated after one year and maybe again after two or more years. The method is useful for the FFS trainer (he / she can assess the results achieved by “his” / “her” FFS group) and also for the participants themselves, individually (they can situate their individual results within the results of the group that will be illustrated in the spider diagram). It can enhance the motivation of the group members if they achieve positive results. The surveys conducted within the framework of the present study helped to develop the method. In particular, they allowed “calibrating” the method with realistic data based on the farmers’ experience and the researcher’s observations. It would be useful now to apply the method to a larger number of FFS groups in the Kyrgyz context. This would allow comparing groups and identifying the key factors that explain the success of the best groups, or the reasons for less successful results in weaker groups.

On the other hand, one question that was raised before the study remains partly unanswered: how can developments agencies, NGOs or government organizations assess whether it is worthwhile starting a FFS with a group of farmers? This question would require setting minimum conditions that a group should meet to be “entitled” to start as FFS group. These conditions can be derived from the spider model, but they can be defined only after a broader application of the model to existing FFS (including FFS that were not successful). The reasons for the failure of FFS groups, if they can be generalized, that is, if they are not due to very specific and local conditions, would serve as benchmarks for new groups (minimum conditions) or they would allow screening new groups, avoiding investments in groups that do not have the potential to succeed. This application of the tool, even before new FFS groups actually starts, would for sure interest development stakeholders, as this would increase the chances for successful investments in agricultural development.

CONCLUSION, RECOMMENDATIONS AND IMPLICATIONS

The literature research had shown that the methodology for impact evaluation of the IPM Farmer Field School is still under development, and at present, no agreed framework for IPM impact assessment exists (van den Berg, 2004). This is not surprising because what is seen as impact of IPM FFS depends on each project’s objective and the perspectives of different stakeholders. Objectives themselves are based on prevailing problems and context of the study area and typically vary with the developmental stages of programs (Braun et al., 2006). To measure impact of IPM Farmer Field Schools in Kyrgyzstan, it is important to bear in mind that impact indicators are chosen to measure the program’s objective, representing an improvement of a problem

situation Kyrgyz farmers face, and not on IPM principles. Frequently used and easily measurable indicators of IPM FFS impact evaluations, like pesticide and fertilizer reductions (von den Berg, 2004), are no real subjects in Kyrgyzstan, due to lack of money and high (world-market) prices, preventing farmers from applying those inputs excessively (FAO, 2007).

Kyrgyzstan is a ‘post-Soviet’ country, where innovative skills like problem-solving, initiative-taking, creativity, etc. were efficiently suppressed by the former system (Kitaev, 1994). Former kolkhoz and sovkhos specialists, who are nowadays small-scale farm-generalists with a huge lack of technical knowledge and entrepreneurship, are particularly in need of training, which gives them the knowledge and confidence to make their own proper decisions (Eveleens, 2004). Trying to evaluate this context-important, broad range of impacts, affecting not only the economic sector of a farm-household, but also the ecological and human-social contexts, is recommended by various authors (Eveleens, 2007; van den Berg, 2004; Braun et al., 2006), yet it makes IPM FFS impact evaluations a real challenge. Reasons for this are difficulties in quantifying and measuring other parameters than yield and pesticide use, lack of methodologies that are accepted by the broader scientific community and short time-line for evaluation studies (van den Berg, 2004). Further context-specific problems make such evaluations more challenging. Most Kyrgyz farmers do not document their yield and production costs, estimates are often weak, they show little self-initiative and responsibility, and they frequently change the results in hopes to be further favored by the program. There are additional influences from other sources, like a high density of other projects or programs especially in Chui Oblast, remittances sent from family members working in Kazakhstan and Russia, strongly fluctuating markets in China and Kazakhstan, and no strong boundaries to family land and high readiness to move or emigrate if a good opportunity appears, affecting the livelihood situation and making changes of farmers’ situation difficult to attribute to FFS-trainings.

The identification and selection of indicators is one of the most difficult steps as each objective can be measured or assessed with many different indicators. The core set of indicators proposed in the present study is a first attempt in that direction, which has proven to work out in the Kyrgyz context. It fulfills the criteria of being manageable, affordable, sustainable and relevant, and it was developed using a participatory monitoring and evaluation approach that involved not only the IPM coordinator, but all stakeholders in M&E. This allows efficient data collection, and proves to be attractive and raise stronger awareness of IPM FFS benefits among stakeholders. Participating in the selection of indicators relevant to them, deciding on the rating scale, collecting data and drawing first conclusions motivates FFS trainers and farmers to improve their activities and skills because

they themselves identify what is achieved. Thus, people's self-esteem and confidence might increase (Groeneweg and Tafur, 2003) and M&E becomes more than a task to fulfill, that can be crossed off a list of obligations. Participation in those steps are also absolutely essential, as only farmers can decide, what indicates a relevant improvement on their livelihood situation and which rating scale is realistic under their specific conditions. The core set of indicators and their ranking described in this article are examples only explaining the approach and need to be further adjusted in a participatory way with farmers, according to prevailing conditions and crops.

To guarantee the quality of the evaluation process, the credibility and accuracy of data, facilitators, as well as farmers need to be trained. Facilitators need training on how to ask open questions and not putting own opinions into farmers' mouths, and how to probe successfully if needed. Farmers need to be trained in taking measuring samples and successful estimation, as they are the stakeholders, delivering and hopefully also measuring most of the data. If M&E will be implemented by trainers, it is useful to integrate the spider diagram as well into FFS-trainings, to document and compare field data, so farmers get familiar with it and might use it also individually for their own needs. But lack of accuracy does not have to be exclusively a problem of training. Certain indicators are not measurable due to cultural reasons or costs and have to be exchanged by other parameters or proxy indicators. Or as Gujit (1998) states: "it is better to be approximately right than precisely wrong – as long as approximations are not distorted and presented as more precise than they in fact are".

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