



SAFA SmallApp Beta-testing

Rice farmers in Karnataka, India

Marcello Cappellazzi

February-April 2015



Sustainability Assessment of Food and Agriculture Systems (SAFA)

The proliferation of sustainable development strategies in both governmental and non-governmental bodies brings an important challenge for users and beneficiaries of such programs. For this reason the Food and Agriculture Organization has committed to establishing a common framework that different stakeholders in the agricultural sector can refer to in order to assess trade-offs and synergies among the different dimensions of sustainability: environmental, social, economical and sustainability of governance. Through a holistic approach steps are taken towards the facilitation of access to the use of sustainability standards for business operators in agriculture related sectors.

The Sustainability Assessment of Food and Agriculture Systems (SAFA) has been developed with the aim of providing a common language for assessing sustainability performance of agricultural enterprises. The process undertaken highlighted sustainability categories and standards that food producers, retailers, consumers, civil society and experts could refer to for defining sustainability along agriculture, forestry and fisheries value chains. However, given the complexity of the tool and the general mission pursued by SAFA, the language and style of assessment could not be applied to the most basic and critical entities in the agricultural sector, that is to say small scale farms.

The need of a more user friendly tool, adapted to the reality of small farms in developing countries lead to an adapted SAFA self-assessment tool in the form of a smartphone app. The SAFA SmallApp has been therefore created with the specific scope of being user-friendly, easy to use and reliable for collecting data in the field. In its Beta version, the challenges identified differed from the ones of SAFA Tool for desktop, which is intended to be used by large agro-businesses and NGOs. The language in SAFA Small was found to be too technical for the farmers to relate with, a challenge compounded by their lack of knowledge of the themes and sub-themes that SAFA refers to.

For this reason, the SAFA SmallApp has now undergone a second round of testing, within which the SAFA SmallApp Beta version testing: rice farmers in Karnataka (India) took place. The activity took place as part of the academic work for the Master in Human Nutrition and Rural Development-Rural Economics and Management offered by Gent University, and has been conducted in collaboration with the University of Agricultural Sciences of Bangalore. The scope of the beta testing phase has been to identify areas for improvement of the SAFA SmallApp and assess its potential use on the field. The version of the App used included some adjustments related to the previous comments which emerged from a pilot test in Kenya and Colombia from August to September 2014. The pilot test in India involved 42 farmers in 4 different districts of Karnataka, all growing rice on an average surface of 1 hectare and applying different practices and using different varieties of rice.

The scope of the India test was to collect quantitative and qualitative data from rice growing farmers regarding sustainability. From this data it is possible to identify critical hotspots for addressing the sustainability of the farms. The quantitative data will provide the material necessary for the assessment of the farms' economic profitability given the combination of inputs used by the farmers and the output generated. The qualitative data will instead look into the farming system as a whole and it's performance measured by the set of indicators defined by SAFA. The exercise could then help identifying actions to be taken in order to increase the sustainability of this common farming system as in the specific context of rural Karnataka.

Methodology in administering SAFA Small

The sample of farmers for testing the App comprised different types of rice growers, producing crops in different conditions and applying different practices. These were sampled according to the variety of rice utilized, the source of water used to irrigate the crops and the location of the farms with respect to the proximity of surface water bodies. The survey has been administered with the support of a fellow FAO consultant and a translator that facilitated the translation of the concepts of SAFA SmallApp for the full understanding of the farmers interviewed. For this purpose, a translation of the questionnaire in the local Kannada language was produced in order to enhance a more direct communication between the assessor and the farmer. All the staff involved in the collection of data had a background in agricultural economics, and the translators had a short training about the scope and principles of SAFA. This created a better environment for the team to cooperate and, in some cases, it provided the opportunity to engage with members of the local community to proactively discuss some of the SAFA themes, in light of the Indian context.

After the first trials, and as a result of community dynamics, groups of farmers were formed in order to create a richer discussion on the issues raised through the use of SAFA. This proved to be a feasible practice since the farmers had a common understanding of the best practices for growing rice, similar surface land under cultivation and often worked on each others' plots during labor intensive phases such as transplanting and harvesting. This adjustment of SAFA SmallApp to assess group of farmers rather than individuals brought several trade-offs but also synergies. A more natural communication between farmers reduced the bias of having a translator managing the conversation with the interviewee. However, not knowing the local language, made it difficult to grasp all the aspects of the conversation. For this purpose, the conversations were recorded, after having the consent of the farmers, in order to improve the qualitative data available for the assessment. As mentioned below, there were advantages and disadvantages when it came to the willingness of the farmers to discuss in groups socially or culturally sensitive issues.

The cultural context of the beta testing had an important role in the organization and management of group discussions for many reasons. First of all, initiating the discussion among peers discharged much of the formality from the communication between farmers and foreign assessors. In the individual interviews the farmers were in fact often not at ease and perceived the assessors as representatives of an institution. When in groups, the community dynamics emerged and the conversation became more informal, creating a better environment for collecting qualitative data. However, the problem encountered was the coexistence of the assessors and the translators' own agenda, creating in some cases a competing environment rather than a cooperative one.

The disadvantage to group interviews was that the translators' bias and the general cultural susceptibility to sensitive issues sometimes resulted in dishonest answers and compliant behavior from the farmers. The answers provided with regards to themes such as gender equality, child labor, or discrimination were likely to try to please the assessors. In some cases, the same happened when discussing environmental pollution or income levels, giving the impression that the farmers did not want to be perceived as misbehaving or complaining about the livelihood on the farm. In order to overcome the problem, a preliminary research on the demographics of the area has been conducted with the support of the Institute of Economic and Social Change in Bangalore, as well as with the professors from the University of Agricultural Sciences that facilitated the data collection process.

Practical implications regarding the use of SAFA SmallApp in rural Karnataka

1. Group interviews
2. Cultural challenges
3. Government interventions
4. Translators
5. Adjustability
6. Aerobic rice sustainability assessment
 1. Environmental sustainability: Paddy fields in semi-arid areas
 2. Economic sustainability: Debt trap for rice farmers
 3. Social sustainability: Countering poverty and marginalization
 4. Governance sustainability: Hierarchical structure of governance
7. Conclusion

In February the SAFA Small Beta App was field tested alongside 42 interviews with rice growers in rural villages in Karnataka, India. The objective of this project was to use SAFA to collect qualitative data in addition to the quantitative data on input efficiency that was being collected in a separate survey. In addition the researchers were able to test the SAFA Small App's capacity to comprehensively assess the sustainability performance of these farms, as well as the user-friendliness of the tool. The following suggestions are based on this project:

- Some areas are neglected by the tool that are important measures of sustainability, such as farm dependance on government subsidies, over-exploitation of groundwater use or dependance on external inputs purchased off-farm (seeds in the case of India)
- There could be a part of the App suited to be used in groups, excluding the social section, provided that the members share common characteristics and belong to similar farming systems
- The experience of collecting data in the local language highlighted the benefits of having a translated version of the questions; a suggestion could be having an option for the assessor to add a translation to each question in order to facilitate the communication with the farmers
- Adjustability has emerged as a relevant issue in some of the cases, both for capturing information regarding culturally and socially sensitive topics (income, livelihoods, discrimination) or geographically relevant indicators (surface trees on the farm, access to water)

1. Group interviews

In some villages the research team was set up in a temple or central space, and farmers came in to meet with them throughout the day. These situations often led to "group" interviews, where multiple farmers would discuss their answers. In others, researchers met farmers in the fields. But given the small size (1 or 2 acres) of many of these farms, often a cluster of farmers would gather to listen to the interviews, resulting again in a sort of group interview setting.

This posed both a challenge and an opportunity. The social setting might have inhibited some honest responses on sensitive social indicators (regarding quality of life in particular.) But it also allowed for a discussion of the environmental and economic indicators which led often to richer, more accurate answers. However, one of the major drawbacks is that the data collected from groups of farmers has limited the amount of information collected from individuals: this may have provided a better

representation of the farming system assessed but some issues must be taken into consideration: the farmers participating in a group should come from a sample with common characteristics such as location, main products, farmland surface and income.

Group dynamics often lead to a bias in the responses of the participants, thus individual interviews should take place alongside with the ones in group. Group interviews are an ideal way to have conversations with farmers that often work on each others' plots, use the same practices and have access to the same markets. The indicators referring to these themes are therefore the most suited for collecting reliable data. Social indicators, household demographics and income, if discussed in group, may lead to bias also in individual interviews due to cultural elements.

2. Cultural challenges

A major obstacle to getting honest or accurate answers to social indicators in India is the fact that it is not socially acceptable to complain or to express being dissatisfied. Especially when confronting farmers in group, the peer pressure resulted in unnaturally homogeneous replies from the farmers regarding their income, their understanding of living wage and their overall approach to sensitive topics. Issues such as child labor, discrimination of women and minorities, fulfillment of basic needs for the farmer and his family have not been thoroughly discussed with the farmers. On the opposite, insisting on such issues often resulted in discomfort with both the farmers and the translators. In many occasions, when asking socially and culturally sensitive topics, the translators excluded the farmers from answering the questions and provided answers based on their own understanding of the context.

Another major bias that SAFA could not entirely capture is the sharp separation in India between the Hindu majority and Muslim minority both in rural areas and throughout Indian society. The only interview conducted with a member of the Muslim minority highlighted some of these difficulties. Access to labor, market and general community assistance due to inherent discrimination in community dynamics forced the farmer to rely on his community of origins (in a different region) to hire labor during the season and sell to specialized market. While this interview might not be representative of the overall condition of the Muslim minority in rural Karnataka, it pointed out a critical issue difficult to grasp through the lenses of SAFA, regarding community adherence and social discrimination.

A last important bias in the interviews has been the lack of participation of women that, even if active in the farm life and especially key in the cultivation of rice, largely did not participate in the beta testing of the SAFA App. The only female participant was in fact sent by her husband to join one of the group interviews, assuming that the project would result in the distribution of subsidies. This misunderstanding, and the fact that both the assessor and translator were males hindered the interview. Having a female team of assessor and translators conducting the interviews with female farmers may be a solution to overcome this problem and better describe the condition of women in a context where even their wage is significantly lower than men'.

3. Government interventions

The subsidies offered by the government to farmers drive production towards farming systems that may

be profitable in some regions, but that are detrimental in others. SAFA has been useful in determining the environmental sustainability and cultural acceptance of practices, but could not capture the impact that the aggregate decisions of farmers had on environmental and social sustainability. One of the shortcomings experienced regarding water use in arid regions was that, where dependence on groundwater use has an extremely negative impact on the sustainability of the farm and community, but it is promoted by the government through the provision of subsidies to operate water pumps for agricultural purposes.

In general, the impact that subsidies have on the sustainability of a farming operation depend on the political agenda promoted at the political level. Thus, it is difficult to design an overarching measure to determine whether the sustainability of a farm is directly linked to the governmental programs enacted in a region. However, it would be relatively easy to assess whether governmental programs result in overuse of natural resources, environmental pollution or dependence from external inputs. In India, the fact that the government is actively promoting the use of hybrid seeds, agro-chemicals and in general the exploitation of natural resources results in a strong dependency of the farmers. This has a detrimental impact on the long term sustainability of the farm and SAFA SmallApp grasped an aspect of it through the Food Sovereignty indicator assessing whether a farmer has control over the crops to grow on the farm.

Moreover, the social programs designed to address the lack of infrastructure and poverty endemic in rural India actually further exacerbate the dependency of farm households on government programs. The National Rural Employment Program and the Rural Employment Guarantee Program are, for example, two attempts by the national government to improve living conditions of the farmers. They provide unskilled laborers a minimum wage to build infrastructures, on the condition that no machinery is used and that no training is provided to the workers. This often results in exploiting farmers that could not otherwise meet their basic needs through agricultural activities. The subsidies program backfires in two ways: on the one hand it sinks the farmer into a cycle of dependency on low wage labor, on the other hand it leaves the farmers unskilled and does not improve his or her ability to generate income on the farm.

4. Translators

During the field visits the team had to rely on the help from translators that, depending on their knowledge of the topics discussed, provided important insights in the lives of the rural communities. The first attempts in having a translator explaining SAFA's questions and indicators often resulted in misunderstandings that hindered the interviews. Topics that could in fact be familiar to the assessor were not easily understood by the translators, even when they were coming from the University of Agricultural Science of Bangalore and had several years of education in agricultural economics.

Since the translators were often coming from an agricultural University, they contributed to some extent to the bias in the assessment of the farm sustainability. The University is in fact teaching concepts of sustainability that are limited if not biased. Moreover, translating such concepts to farmers in a language not understood by the assessor precluded the opportunity to access important information that may have emerged in the conversations. For this purpose, it has been an accustomed practice to record the conversations on an audio device with the intention of listening to them later, with the help of a third party. By doing so it would have also been possible to hear parts of the conversations the

translator was not intending the assessors to understand. As discovered later, it is a common practice for the translators to “manage the data” in order to provide foreigners with the data they are looking for also in cases when the farmer are not able or willing to answer questions. This was a challenge of going into an area without a local connection and the problem was sometimes navigated by relying on a member of the community that could speak English and by printing the SAFA SmallApp questions with a translation in Kannada. This highlights the importance of having local partners and establishing a connection as direct as possible between the assessor and the farmers.

5. Adjustability

During the beta testing, a preliminary feedback was submitted and has contributed to to the overall improvement of the SAFA SmallApp. The new version of the SAFA SmallApp would have produced more interesting results since some of the questions were specifically designed after experiences on the field in the specific context of rural India.

This raises the important point of having a sustainability assessment based on questions that are adjustable to the cultural and geographic context in which it is practices. In Karnataka, for example, there have been some questions that were felt as irrelevant by the rice growers, such as the description of the area covered by trees on the farm. Rice farms in Karnataka are in fact clear land where, for the sake of rice production, having a surface covered with trees would result in inefficiency. If the assessors were given some freedom in adjusting the tool to grasp the specific forms of sustainability in all four dimensions could produce relevant results and would make the use of the tool in a given context a better experience for both the farmer and the assessor

6. Aerobic rice sustainability assessment

Context

Flood irrigated rice constitutes a critical case for the assessment of farming systems in India. This type of production system is in fact feasible only if some conditions are given: low labor costs and ample availability of water. This method of cultivation requires transplantation of rice from a nursery to a paddy field with 4-6 inches of standing water. The practice, requiring intensive use of water and labor, has made India the second largest rice producing country in the world. However, from a sustainability perspective, this system fails to meet some basic principles in all the four dimensions considered by SAFA. Moreover, depending on the area considered, some of the shortcomings of rice production may become more severe due to water scarcity, increased dependency of the farm from external inputs or decrease in rainfall.

The case selected for the beta testing of the SAFA SmallApp is Karnataka, a state in Southern India where several different climatic conditions can be encountered. In the analysis proposed the farms are located throughout the State, encompassing both water rich regions with plentiful of resources thanks to the Krishna Raja Sagar Dam in Mandya district, and water scarce regions in Tumkuru district, where farmers mostly rely on groundwater.



District name		E	Kanakapura
A	Tumkur	F	Kambalapura
B	Gowribidanur	G	Byrasandra
C	Rajankunte	H	Mangala
D	Bidadi	I	Rajapura

One of the key elements that has become key for rice farmers is variability of rainfall. Kharif rice, also known as Winter Rice, is sowed in May and harvested in November. Growing Kharif rice brings benefits due to the higher rainfall during the monsoon season. For this reason 84% of the rice produced in India is grown in this season.

On the contrary, Rabi rice is grown in the Summer months, between December and June. During this period rice production is sustainable only in regions where water is widely available.

Performance hotspots

Water availability and rainfall variability are important catalysts that are pushing researchers and farmers to seek ways to increase the efficiency in use of water for rice production. One of the concepts that has been identified by institutions is deficit irrigation as a way to reduce the amount of water required to grow rice and other crops. Sugarcane and paddy are the first options to be explored in this sense, since these can be considered the most water intensive crops. Providing water at a less than optimum level is therefore a way to save water, electricity and public investment in water storage devices.

For this reason, different practices and rice varieties are being tested in Karnataka and other rice growing states in order to assess the economic profitability, compared to conventional rice varieties. Aerobic rice stands out as a combination of sub-optimal irrigation practices and varieties of rice with an adequate root system to survive in aerobic (non-flooded) conditions. For this reason, the sample considered for the test comprises groups of farmers growing aerobic rice in regions rich of surface water and groundwater alike in order to explore the sustainability level given different constraints over the input use.

Environmental sustainability: paddy fields in semi-arid areas

Paddy fields are considered among the major contributors to methane emissions, due to the anaerobic decomposition of organic material. For this reason, aerobic rice cultivation figures as a more environmentally sound practice since it also encompasses measures for reducing water consumption. SAFA could not fully grasp the challenges that conventional rice farms face in terms of environmental sustainability; however, through the discussion with the farmers, water has been selected as the most important factor influencing the natural resources balance. A second relevant issue impacting the environmental sustainability of the farms has been the selection of hybrid varieties of rice to substitute the traditional breeds the farmers would rely on for cultivation. As mentioned by the farmers, traditional varieties are used by subsistence farmers, but hybrids and commercial varieties are the most

common for producers selling in the market. One particular case is the one of farmers growing rice in semi-arid areas, which have a severely negative impact on the environment because of the high quantity of fertilizers, hybrid seeds and groundwater that they can access and use thanks to governmental subsidies. While this phenomenon does not constitute a critical problem for farmers growing in water rich areas, it highlights a performance hotspot that better designed governmental action or NGOs could target. Measures tailored to reduce water consumption, adaption of traditional varieties of rice and, in general, substituting paddy fields could trigger positive repercussion on the environment and on the sustainability of the farms. The misuse of pesticides has also been recorder among conventional rice growers, as a result of easy application on a paddy field by dissolving the chemicals in the standing water. Countering this practice or promoting aerobic rice varieties could limit the problem of misuse of pesticides and chemical fertilizers.

Economic sustainability: debt trap for rice farmers

The governmental subsidies also have a negative impact on the economic sustainability of the farm. As a consequence of subsidization of seeds, agro-chemicals and water extraction, the farmers are dependent on the public flow of money to sustain basic farming activities. This dependency is strengthened by other programs in support of rural livelihoods, making the farms vulnerable to any change in developmental projects. Measures to increase the resilience of the farms are equally important for both farmers accessing surface and ground water, since many of the subsidies apply to both categories. The combination of hybrid seeds and dedicated fertilizers and pesticides lock the farmers in system requiring high investments in machinery and inputs. Considering the fact that farmers are often living in a condition of poverty, this means that they are pushed into contracting debt with financial institutions or loan sharks, further exposing their livelihoods to external risks. The asymmetry of information further exacerbates the problem, since farmers are convinced, both by advertisement and extension programs, about the quality of production that commercial varieties of rice would bring. The combination of all these elements has the tragic consequence of often resulting in bankruptcy of the farm, inability to pay off the debt and, eventually, the suicide of the farmer, locked in a debt trap from which it's impossible to escape. This tragedy is affecting many of the rice and sugar cane growers in water scarce regions. Again, targeting subsidy programs should be a priority in the area and better information could provide the farmers with a better knowledge of what the risks and alternatives to commercial production are. Credit also emerged as an hotspot for action, but no concrete solutions have been identified through the SAFA SmallApp beta testing.

Social sustainability: countering poverty and marginalization

A consistent problem encountered in all the districts where the assessment was conducted was the endemic poverty in rural areas. The problem arises from the discrepancy between the farmers wage and what an appropriate living wage should cover. Many of the farmers interviewed, when asked, said that their wage could cover their living expenses. Once more attention was given to the details of what a living wage should cover, the answers would be more accurate. In some cases, the farmer could not cover with his wage basic needs such as meals for his family or education for the children. Granting the farmers an agricultural income that could ensure decent standards of living should be among the top priorities in rural India. Very few farmers have been found having a positive balance between costs and profits in their agricultural activities. Their livelihood is in fact dependent on agricultural subsidies and income generating programs promoted by the central government. There are several programs both at the local and central level that try to minimize the adverse effects of poverty in rural areas by

promoting educational activities in every village, or by providing food staples to people living below the poverty line. These might have a positive effect in terms of controlling an immediate emergency, but in the long run the system further exacerbates the dependency of rural communities from the government support. An hotspot for actions to increase the social sustainability of farms would be to engage in activities that would improve the resilience of the household. Any program that would empower local communities for providing basic education and nutritious food to the families could potentially reduce the dependency of the farms from governmental programs

A second area of intervention that emerged as urgent in rural communities is gender equality. Women are key players in agriculture, especially in rice growing farms where they are employed during the labor intensive stages of production. Granting an equal salary for men and women would already be a basic target to achieve, in a context in which wages for men are often double those for women.

Governance sustainability: hierarchical system of governance

The strong presence of the central government in rural India severely limits the governance sustainability of the farms. Through the use of subsidies, and by directly intervening in providing agricultural inputs, the government *de facto* decides for the farmers the structure of their farming systems. The hierarchical power of institutions over farmers is endemic to the culture and social structure in India and, when selling the rice to the government, the prices are not transparent and are imposed on the farmers. Recently a governmental agency has been created with the purpose of decentralizing the governmental action and bringing it closer to the farmers. The ATMA (Agricultural Technology Management Agency) has the mission of providing solutions for the problems the farmers face on the ground. However, the political direction given to the agency is the one of the Indian Council of Agricultural Research, an institute that played a pioneering role in ushering Green Revolution in India. Being an independent agency within the Ministry of Agriculture, ICAR can rely on the grassroots structure of the Krishi Vigyan Kendras (KVK) to get directly in touch with farmers. The KVKs are in fact extension centers that, for demonstration purposes, run projects with the local communities to diffuse new technologies. The involvement of the farmers in the decision-making process is however limited since most of them are directly run by ICAR, or refer to State Agricultural Universities, instituted through the Ministry of Agriculture. This hierarchical structure should be targeted as a way to improve the governance sustainability of the farms. For a proper governance system to be in place the decentralized system comprising the KVKs and other local institutions should be accountable to the local communities and should not be operating as a local branch of the central government.

The political agenda that is being promoted by the government and its independent agencies appeal to the lack of information the farmers are exposed to. By coupling extension services with the provision of subsidies, the government is presented as a benefactor to the farmers that would not therefore question their guidelines. Among rice growers the only complaint towards the government concerns the price at which they purchase cereals. Creating an alternative system may result in higher income for the farmers. One case that was found to be remunerative for the farmer has been the one of a aerobic rice grower that would save and sell the seeds to other farmers and to the KVK with the purpose of diffusing the technology. This case demonstrates that farmers with a better control over their resources can profit from market opportunities and have a more sustainable enterprise.

7. Conclusion

The field experience of testing SAFA SmallApp has first of all demonstrated how relevant it is to have a tool capable of assessing sustainability in all its dimensions. Using SAFA SmallApp found that farms growing rice using groundwater in semi-arid regions perform worse in term of sustainability than the ones using surface water. This has emerged without regards to the fact that groundwater use has not been fully captured by the SmallApp, while it is tailored by the SAFA desktop tool. This highlights the potential of SAFA as a valuable tool to support quantitative research, but needs adjustments to be fully comprehensive. The case of the governmental subsidies in India is a clear example of how actions geared towards “buying” economic and social sustainability not only create a system of dependencies, but have a negative impact on the environment and on the governance structure.

In terms of testing the App itself, the experience has been overall positive and the farmers interviewed could understand and provide answers to most of the questions. This can be considered already an improvement from the previous version of the App that was found by the farmers to be too technical and complicated. The logistical problems encountered through the beta testing phase have however unveiled some structural problems that relate to SAFA's objectives. The problem of fragmentation between several sustainable development strategies also includes a diversified understanding of what sustainability means. Depending on the cultural and social context farms can be perceived more or less sustainable depending on different factors. While, for example, conventional rice growers in semi-arid areas can easily be identified as non-sustainable, the same can't be said about conventional rice farmers using surface water. However, for the sake of full cost accounting, also those farms may result being unsustainable if GHG emissions are considered, as well as polluting natural and artificial waterways or eroding agro-biodiveristy. For this example, a full cost accounting should in fact also include the health problems deriving from impacting the quality of drinking water for large rural communities, as well as the malnutrition deriving from a switch to mono-cropping rice varieties selected for maximizing their yields, rather than their nutritional content.

Envisioning an App that could account for these effects is surely difficult, and SAFA SmallApp is the closest example of how it could look like. The beta testing conducted in Karnataka highlighted the opportunity of assessing farmers in groups. By providing data describing a farming system as a whole it could be in fact possible to simplify the model to be assessed and connect external costs that can't be appointed for the individual farms. This can be referred to as a challenge in linking the micro-level of assessment the SAFA SmallApp is designed for at the moment, and the macro-level of sustainability of a farming system as a whole. Including this aspect in the App could provide an even more encompassing holistic approach to agriculture-related problems. This final comment fall outside the scope of the previous comments and the general purpose of the SAFA SmallApp beta testing, but it is provided as a suggestion to explore an opportunity that emerged during the field activities.

A more structured field activity, with the most recent version of the App and the possibility to access the results for both the farmers and assessors, would surely produce a more relevant feedback covering areas that have not been considered in the discussion above. Based on the experience with SAFA SmallApp in the months of February, March and April 2015, it can be said that there exist major improvements the App could undergo in order to better measure the sustainability dimensions. However, if considered as an instrument and a new interface, the App can be considered ready to use and adaptable to challenging contexts such as the one of rural Karnataka.

What worked well:

- User friendly format, the experience with the design of the SAFA SmallApp has been positive
- The explanation of SAFA sub-themes and objectives were helpful to understand what the indicator questions were supposed to capture
- Group interviews reduced the amount of time spent discussing the themes and indicators with each farmer
- Relying on local contacts and members of the community helped establishing a link between the assessors and the farmers
- Having farmers sharing common characteristics participating in the assessment simplified the discussion and provided information that represented the entire sample homogeneously

What did not work well:

- Some areas were not fully captured by SAFA SmallApp that could impact the farms' sustainability. For example, government subsidies have been found to have an important impact on the overall sustainability of the farm. One indicator that helped discussing this issue was the Food Sovereignty indicator (“How much do you agree with the following statement: I have the option to choose to produce the crops and products that I want on my farm”). However, most of the farmers did not perceive governmental subsidies as a constraint to their freedom of choice, thus making the indicator inefficient for the purpose above mentioned
- The version of the App used on the field did not provide a result or score for the submitted modules, making the exercise incomplete
- In remote areas the use of GPS to record the location of the farm has proven to be difficult to operate, delaying the interview
- The idea of assessing sustainability in the context of rural India has proven to be difficult because of the cultural and social inertia on such topic
- In areas where there were no local contact, arriving with a translator generated misconception, cultural obstacles and other challenges that presented an obstacle to accurate assessment
- Relying on translators has been necessary, but has produced biases in the collection of data especially because of the translators' own understanding of sustainability as a concept
- Some of the questions included in the assessment were not suited for the cultural and geographical context where they were asked; the project revealed the need in some cases to adjust the SAFA SmallApp to the specific context within which it is used

Feedback on the SAFA Small survey from field testing

Indicator	Comment	Suggestion	New version
<p>Which best describes your level of commercialization?</p> <ul style="list-style-type: none"> • I am a subsistence farmer • I sell mostly to local markets/customers • I am a fully commercialized farmer (sell goods mostly for export) 	<p><u>Multiple purposes of production</u>: some farmers were confused because they could not pick one option. In South India it is a common practice to sell high value added crops in the market (both domestic or international), but also dedicate large parts of the farmland to production for self-sustain the household.</p>	<p>Create a list of options, and allow assessor to check all that apply. Examples: subsistence farmers, selling to local markets, commercialized sale to broker for export, growing under contract with integrator/company, etc.</p>	<p>The answer “I am a contract farmer (with a company or public-private partnership)” was added and the question is designed to allow multiple choice.</p>
<p>Do your costumers or buyers know that if there is a problem with your produce that you would take responsibility to solve the problem? [weight: 1]</p> <ul style="list-style-type: none"> • Always or often (green) • Sometimes (yellow) • Never or rarely (red) 	<p><u>Poorly phrased question</u>: the question was interpreted by the farmer as being about conflict resolution with costumers or buyers. It brought up stories from the farmer about previous disagreements with buyers (dry coconuts in fact.) But it did not elicit discussion about the farmer's own practices in terms of accountability.</p>	<p>It may be easier to ask the farmer to describe directly the steps they take to ensure that they meet their agreements with customers/buyers, and ask if there have been any problems, and if so what were the ways the farmer worked to fix them. The rating could be determined by the assessor, based on green = proactive, yellow = responsive, red = passive.</p>	<p>The question has been rephrased as “Do you keep accurate records of your production processes (e.g., Planting and harvesting information, input use) so that they can be made available to stakeholders (e.g., producer organizations,, customers, suppliers etc) when required?”</p>
<p>How many buyers do you have for your significant crops and products? [weight: 1]</p> <ul style="list-style-type: none"> • I usually have multiple people or places to sell my product(s) to (green) • I usually have one or two 	<p><u>Local market</u>: the products of the farm may be delivered both on a stable basis (to retailers, middlemen or government) or in the local market where it is not possible to establish stable relationships with a number of buyers, and where prices may be variable. Local markets do</p>	<p>Ask directly about the key issue which is: do farmers feel they have a choice in where to sell their products? If so, are they free to choose where to sell, and are they able to choose based on information about where they can</p>	<p>The question “Do you feel that you have a choice in where to sell your products” has been added.</p>

<p>people or places to sell my product(s) to (yellow)</p> <ul style="list-style-type: none"> I do not have a regular person or place to sell to (red) 	<p>not fit very well into any of the answer options for this question. In trying to make a suggestion we found the challenge is that farmers selling to the local market may have a variety of experiences – good and bad – thus selling to a local market should not automatically generate a particular rating. Many farmers in India decide to sell to the government in order to approach a stable market, even if that implies a high taxation on the products.</p>	<p>get the best price? Another suggestion may be to phrase this indicator differently: Is there a market that the farmer would like to sell to or access but can't for some reason?</p>	
<p>Do you have a risk management plan that accounts for minimum costs or support in case of harvest loss (e.g., community supported schemes, agreements with cooperatives or buyers)? [weight: 1]</p> <ul style="list-style-type: none"> Yes (green) No (red) 	<p><u>Informal risk management</u>: the question does not take into account measures to address risks related to the variability of inputs. In the Indian context examples would be investments the farmer may have done to ensure a continuous provision of power to electric pumps, or storage of water for allowing irrigation at times of water scarcity. These are practices that farmers use to diversify risks, as well as choosing a cropping pattern suited for the context where they grow their products. An assessment of risk management by SAFA should take into account also the investment the farmer sustains in order to minimize his or her exposure to risk.</p>	<p>Add a second question to this topic asking, has the farmer implemented on-farm measures to reduce risk from variability in natural circumstances and inputs (for example building a tank for water)?</p>	<p>“Have you implemented on-farm measures to reduce risk from variability in natural conditions and inputs (e.g., building a water tank)?” has been inserted as a follow up question.</p>
<p>Do you or your producer</p>	<p><u>Comment for consideration</u>: a producer may rely on organic production</p>		

<p>organization own or control your certification? [weight: 1]</p> <ul style="list-style-type: none"> • Yes (green) • No (red) • I don't know/other (neutral) 	<p>practices but fail in having a certification due to high transaction costs. Instead of considering the ownership of the certification the question may refer to the ability of the farmer to individually obtaining such certification. Indian farmers, due to the high costs related to obtaining a certification and the time needed to complete the process (up to three years), may applying organic farming practices but choose not to apply for an organic certification.</p>		
<p>Do you participate directly in any community welfare projects (e.g., building community facilities, roads, schools, clinics, water works; organizing youth activities; or donating food or produce to community events)? [weight 1]</p> <ul style="list-style-type: none"> • Yes, I regularly participate in or organize projects that benefit my community (green) • I am aware of projects like these in my community, and I participate in them occasionally (yellow) • I do not participate in community welfare projects (red) 	<p>We experienced that the farmer did not think of their own activities as community activities. One farmer in particular had build a pond that would collect rain water in the rainy season, and thus refill the wells of his own farm and his neighbors farms throughout the dry season. This is an example of community investment, of farm practices having positive benefits for other stakeholders.</p>	<p>Rephrase the question to also ask if farm practices have a positive benefit for others. “Do you participate directly in any community welfare projects, or do your farm activities have direct benefits for your community?” (Examples: managing a shared forest, building ponds for water management, etc)</p>	<p>The question also includes the segment”do you undertake activities that have direct benefits for your community (e.g., managing a shared forest, building ponds for water management)?”</p>
<p>What is your opinion of the overall quality of life on the farm compared to the previous year? [weight 1]</p> <ul style="list-style-type: none"> • Good (green) • Not good, not bad 	<p>This question is far too general and was received with confusion by farmers. Especially given a tendency to not complain publicly, they answered positively regardless. This required that the assessors knew ahead of time what this question actually was supposed to be about, and asked multiple different questions in order to ascertain a real answer. Therefore, this question simply does not work in an assessment of sustainability. The heart of the</p>		

<p>(yellow)</p> <ul style="list-style-type: none"> • Bad (red) 	<p>matter in quality of life is whether the farmer can afford (in terms of time, money, and lifestyle) to take care of their needs.</p>	
<p>Do you hire paid labor? [trigger question, not rated]</p> <ul style="list-style-type: none"> • Yes • No <p>How do the wages you pay farm workers compare to what is typically paid to farm workers in your region? [weight 1]</p> <ul style="list-style-type: none"> • Equal to or greater (green) • Less than (red) • I don't know (yellow) <p>How do the wages you pay farm workers compare to the national minimum wage? [weight 1]</p> <ul style="list-style-type: none"> • Equal to or greater (green) • Less than (red) • I don't know (yellow) • Not applicable (neutral) 	<p>A suggestion to at least cover the key points of living wage would be to use the following 2 questions, one which addresses the farmer's income and one which addresses their employee's income:</p> <p>Which of the following can your employees afford comfortably (meaning 7 days per week or as often as necessary) based on the wage rate that you pay them, without having to have a second source of income?</p> <ol style="list-style-type: none"> Three meals a day for themselves and their family that include fruits and vegetables, and meat if they choose to eat it Appropriate clothing for themselves and their families including shoes, clean clothes for school or work, warm clothes in winter, etc Medical care including visits to doctors for themselves and their families, and prescriptions or medications Educational expenses for children including school fees, uniforms, books and transportation (of N/A if no children) Sufficient clean drinking water in their homes Access to safe means of regular transportation Sufficient housing that is safe and protects from the weather Energy expenses that allow light and adequate heating or cooling (such as fans or heaters) when necessary Savings of at least 10% of their income to set aside for cultural or recreational activities and other expenses 	<p>The suggestion has been included in the SAFA SmallApp both for assessing the income level of the farmer and the wage level of the employees on the farm.</p> <p>The two questions regarding the comparison between wage on the farm and regional and national wage levels have been excluded from the assessment.</p>

	RATING: All = green. 5 – 8 = yellow. Less than 5 = red.	
<p>If you hire labour, what is the main source of your workers? [weight 1]</p> <ul style="list-style-type: none"> • I hire mostly workers from the local community (green) • I hire mostly migrant workers or workers from outside my local community (red) • I hire workers from the local community and also migrants or those outside of my community (yellow) • Not applicable (neutral) 	<p><u>Comment for consideration:</u> We found one farmer who was unable to find willing local laborers, because he was using organic practices and this had created skepticism in the community. When asked this question, he wanted to answer that he tried to hire local but was unable to. Other farmers may have this response for different reasons. It could be a suggestion to include an option with a yellow rating that says farmers try to hire local but can't because of outside circumstances.</p>	<p>The option “I tried to hire local workers but was unable to do so, due to circumstances that did not depend on me” was added</p>
<p>Do hired workers in your region have safe conditions, adequate pay, and fair treatment? [weight 1]</p> <ul style="list-style-type: none"> • Definitely do (green) • Sometimes (yellow) • Definitely don't (red) 	<p>Asking farmer's opinion of the regional working conditions does not seem to be a good indicator. Farmers may answer that yes, everything is safe, because they do not want to implicate themselves or convey any complaints. Farmers in India answered that yes everything was safe, fair, etc, despite the fact that we could easily see this was not the case. See previous comments about regional wage as further explanation of why adequate pay is problematic in this question, especially concerning the huge discrepancies in pay between men and women, which farmers talked about as an accepted and fair practice. Other than being a conversation starter, this question does not provide any useful material to serve as an indicator. Even if the region were to be generally safe and regional wages were generally good, that does not necessarily reflect the conditions on that farm. We recommend deleting the question – it is very subjective and does not provide any material for rating.</p>	

<p>If you hire women, immigrants, or ethnic/religious minorities on your farm, how often are they paid the same as a local man of the dominant ethnicity and religion? [weight 1]</p> <ul style="list-style-type: none"> • Always or often (green) • Sometimes (yellow) • Never or rarely (red) – no go • Not applicable (neutral) 	<p>“Would you allow any employee on your farm to express their identities (examples: speak freely of sexual identity, have safe place and break time for prayer, have freedom to wear cultural clothing or symbols, etc)”</p> <ul style="list-style-type: none"> • Yes (green) • No (red) <p>“In case of harassment or discrimination amongst your employees (example: sexual harassment of women), how would you respond?”</p> <ul style="list-style-type: none"> • I am comfortable implementing a procedure to protect vulnerable groups (green) • I do not have a plan or procedure, but I would take action (yellow) • I would not personally take action (red) • I would fire the employee that complained (red) 	<p>The second question was added, but the options offered only comprise</p> <ul style="list-style-type: none"> • “I am comfortable implementing a procedure to protect vulnerable groups • I do not have a plan or procedure, but I would take action • I would not personally take action”
<p>Did you have more than one serious injury on your farm during the last year (enough to require medical attention)? [weight 1]</p> <ul style="list-style-type: none"> • Yes (red) • No (green) 	<p>Injuries can happen for many reasons and injuries by themselves are not a good indicator of safety of the workplace. It seems the more important issue is whether the farmer is proactive in avoiding these, and prepared in case of emergency. We would recommend including questions that would be indicators of this type of preparation, such as: Do you have first aid kits or emergency medical material on the farm (bandages, antiseptics etc). Are you aware of the risks and hazards on your farm, and do you warn your employees of these? (examples: snakes, how to handle a snake bite, etc). Do you keep machinery and dangerous tools stored and well maintained? Etc.</p>	<p>As a follow-up a question with multiple choice options have been added: “how well are you prepared to avoid risks on the farm and to handle emergencies?”</p>
<p><u>Indigenous knowledge</u>: We did not find this issue captured in the SmallApp, but we think it is a relevant indicator for sustainability. The issues for indigenous knowledge that would be relevant are both preservation of the knowledge and sharing of the benefits with the communities where this knowledge has originated. Se we would recommend adding the following questions</p> <ul style="list-style-type: none"> • Do your product have an higher value added thanks to traditional(indigenous knowledge)? 1. Yes (green) 2. No (neutral) 		<p>The question was added in the latest version of the SAFA SmallApp</p>

