RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security

CGIAR CCAFS

Info Note

The Rural Household Multi-Indicator Survey (RHoMIS)

A rapid, cost-effective and flexible tool for farm household characterisation, targeting interventions and monitoring progress towards climate-smart agriculture

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Key messages:

- RHoMIS is a rapid, cheap, digital farm household-level survey and analytical engine for characterizing, targeting and monitoring agricultural performance.
- RHoMIS captures information describing farm productivity and practices, nutrition, food security, gender equity, climate and poverty.
- RHoMIS is action-ready, tested and adapted for diverse systems in more than 7,000 households across the global tropics.
- Want more info? See: http://rhomis.net/

Billions of dollars will be invested in 'climate-smart agriculture' (CSA) programs in the near future through bilateral aid and International Banks. CSA aims to help smallholder farmers sustainably increase *productivity*, build *resilience* to climate variability and change and *mitigate* climate change—where possible. With investments, political will and implementation capacity, CSA is emerging as a mechanism for coherent and coordinated action on climate change adaptation and mitigation for agriculture.

Ambitious and explicit targets have been set to reach millions of smallholder farm households with CSA. However, questions remain over which intervention to use in which context, or how to measure progress toward these targets at this time. The lack of 'targeting' of interventions—matching the intervention to the context—reduces efficiency and effectiveness of programming and ultimately decreases the likelihood of meeting development goals. Furthermore, the lack of agreed upon metrics for systematic monitoring of CSA projects, programs or policies hampers efforts to track progress, respond quickly to changing conditions and implement results-based management at the multi-site scale implied by the targets set.

Targeting interventions and monitoring progress are, arguably, two of the greatest and least addressed challenges in scaling up CSA. There is an urgent need for tools that produce standardized, coherent, cost-effective and decision-relevant information to support efficient and effective development programming.

The Rural Household Multi-Indicator Survey (RHoMIS) provides an implementation-ready solution that produces cost-effective information for planning and monitoring CSA investments across a range of rural contexts. It is a flexible digital platform built on open-source software that can be easily modified to meet a range of needs while collecting a core set of data that feeds into a global discussion on the success of CSA. Here we describe key design principles behind RHoMIS and present results that show the power of harmonized datasets to facilitate evidence-based decisions and adaptive management of programming.

Figure 1. Household survey being conducted on a tablet in Tanzania. Use of electronic data collection tools in RHoMIS increase accuracy, reduce costs and enable real-time evidence-based decisions. Photo: N. Palmer, CCAFS.

Design principles

RHoMIS is a household survey tool with data storage and analysis functions included, designed to rapidly characterize the state and change in farming households by a series of standardized indicators. It was designed in response to an expressed need from development practitioners to improve current approaches in targeting and prioritization of intervention options and the monitoring of farm households. During development, the RHoMIS team adopted the following five design principles:

1. **Rapid**. The survey has to be short, mitigating participant fatigue or annoyance, and permit collection of larger sample sizes for less cost.
2. **Useful**. The survey has to be utilitarian, in that all data gathered need to be used in pre-defined analyses.
3. **Accessible**. The survey has to be user-friendly, so that implementers can perform data collection and analysis tasks with minimum training.
4. **Adaptable**. The survey must be easily modifiable, to suit local context of the farming systems and project needs, while maintaining its systematic and harmonized core indicator set.
5. **Reliable**. The survey should not be vague, questions should be easy to understand and answers based on observable criteria or direct experiences.

RHoMIS captures in a systematic manner up to 20 important performance and welfare indicators together with key farm level drivers, livelihood data and management decisions (Figure 2), in a 40-60 minute survey. The indicators cover a wide range of system and livelihood characteristics (see blog for full list) and have been implemented in a modular setup to ensure easy adaptability of the tool.

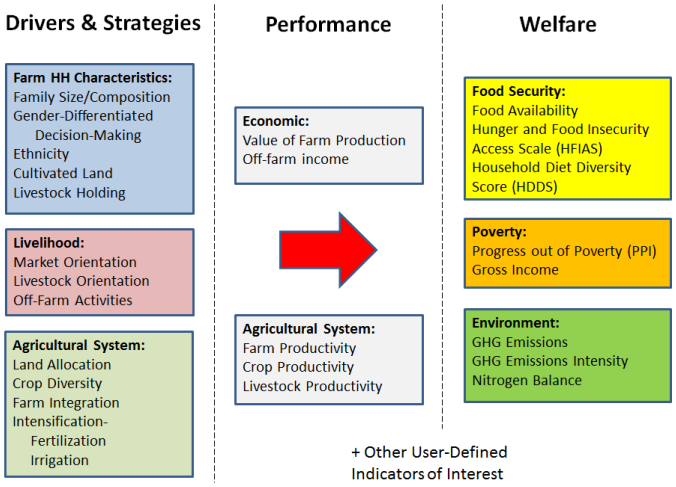

Figure 2. Overview of the key farm livelihood characteristics, drivers and performance and welfare indicators quantified by RHoMIS.

Each module collects the information required for calculating one or more related performance indicators. New indicators can be added or removed as necessary for a given survey campaign. For example, the team is now testing a new motivations and aspirations module to understand more about farmers who are open to change and innovation. We compare changes in farming practice and livelihoods over time, stated plans for the future, and farmers intrinsic values and attitudes, which yields important information for targeting extension activities and interventions. With this information we can also identify so-called 'positive deviant' farmers, i.e. farmers that perform better than other farmers with similar resources, together with their farm management strategies and their motivation.

Survey and data handling process

The survey itself is conducted on android smartphone or tablet. Data are uploaded to an internet server, either via a laptop or direct from the android device, for storage in a confidential database. The back-end analytical engine runs automated analysis routines that support almost real-time information delivery to front-line workers and program managers (Figure 3).

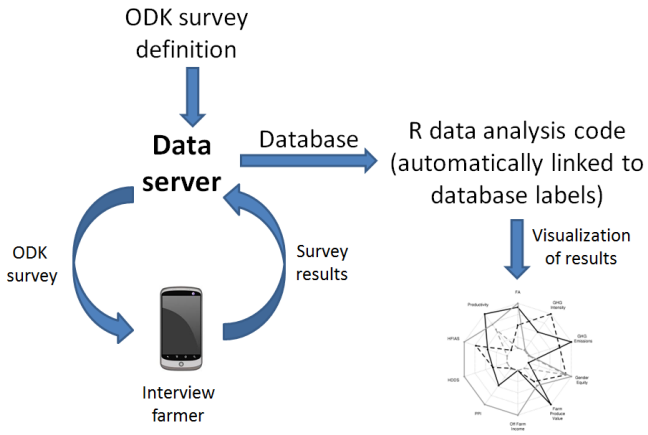

Figure 3. RHoMIS' work flow from survey download to mobile device through automated data analysis and outputs.

This near immediate feedback means that the time lag between data collection in the field and actionable information becomes very small. Shortening the duration is critical to improve adaptive management helping to quickly identify successes and scale up what is working well, but also move past what is not working quickly without wasting time and money. Because RHoMIS is digital and implemented on open-source software, it is accessible to all institutions who have access to a computer and internet, for free.

Spontaneous use

Since it was designed in 2015, RHoMIS has now been used in Central America; West, East and Central Africa; and South and Southeast Asia to characterize more than 7,000 farm households, evaluate management options, identify locally best-performing farmers, track changes in farm households over time, and relate observed changes in farm household performance to changes in farm management and land use (Figure 4). The uptake of RHoMIS by 12 organizations (including CGIAR Centres, iNGOs and National Research Organizations) has happened only by word-of-mouth and without significant promotion of the tool. The simplicity and flexibility of RHoMIS has catalyzed spontaneous adoption of the approach. Users are not viewed as clients but as collaborators in the iterative development of the RHoMIS approach which contributes to continuous improvements in the tool and the subsequent data analyses.

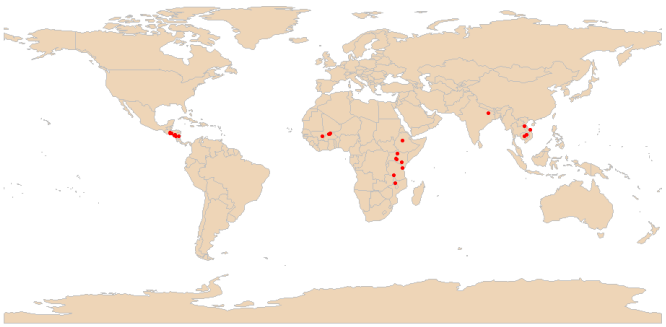

Figure 4. Current RHoMIS survey applications globally which include implementations by 10 projects, 15 diverse farming systems on 4 continents.

State and trends

To illustrate how RHoMIS results can be used we show two outputs. First, a visualization of the variation in food security status related to farm livelihood practices, within a single site in which the farmers experience the same biophysical and socio-economic conditions (Figure 5). Second, we show variation between sites in terms of factors determining key welfare indicators on dietary diversity and income (Figure 6).

Figure 5 shows the variation in Food Security levels of 200 households in Lushoto, Tanzania. For each individual household we quantified their food security status (the size of the bar), and the value of their various farm products and off farm incomes (the different colors within a bar). Two observations are striking: 1. There is an enormous variation in food security status within one site. Subsequent analyses have shown that this variation is mainly driven by the productive assets that the different families own, i.e. how much land can they cultivate and how much livestock they own; 2. With improving food security status the mix of livelihood activities strongly change: farm households with low food security focus on subsistence farming, producing food for home

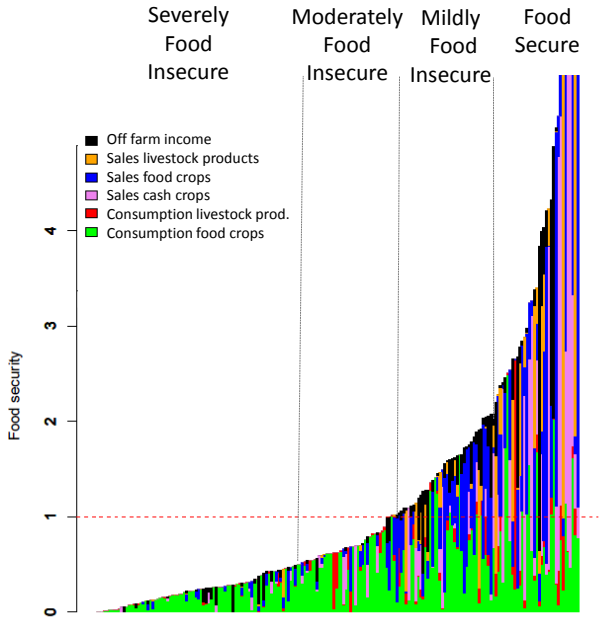

Figure 5. Within site variation in food security and it's determining factors for 200 households in Lushoto, Tanzania.

consumption, whereas the farmers with higher food security status tend to first fulfill their own food consumption needs and still have enough land and livestock to produce products for sale to market.

This differentiation in strategies followed by farmers has strong consequences for the likelihood that different farmers will adopt certain intervention options. The food insecure farmers may be interested in interventions that are mostly outside of the farm, as agriculture is unlikely to solve their problems, although increasing the productivity of the staple crops might alleviate their situation. The farmers on the right of the curve are the target group for climate smart agriculture and (sustainable) production intensification, be it crop or livestock focused. These results stress that there is no fit-for-all set of technologies, but that it is important to match technologies to the livelihood characteristics.

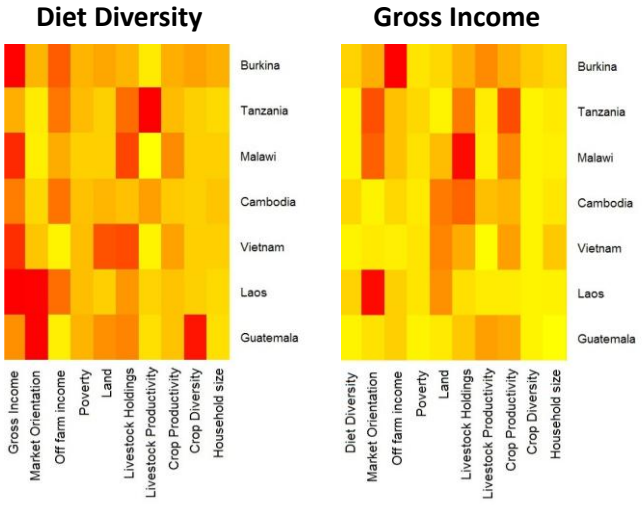

Figure 6. Association between high diet diversity and gross income and driving factors (red is a high association, yellow is a low association)

Figure 6 shows RHoMIS results for sites in 7 different countries to determine the drivers of high diet diversity and high gross income. Three observations are striking: 1. There are consistent patterns visible that hold across sites. High gross income and market orientation relate to high diet diversity, while land and livestock holdings generally correlate with gross income levels; 2. There are also strong differences between locations. The local context is a key determinant of the productivity of land and livestock, and how the crops and livestock products are used, thereby affecting diet diversity and gross income; 3. There is a strong difference between which factors relate to high diet diversity and which to high gross income. This means that in the short term technologies that target income do not necessarily lead to immediate improvements in diets and visa versa. Development programs that try to target both of these welfare indicators should therefore come with a diverse set of options.

Conclusions

RHoMIS' provides a rapid characterisation of farm systems, including household and farm welfare and livelihood strategies. Results support planning, management and monitoring of specific CSA interventions and projects. The applications are not limited to CSA as the RHoMIS tool is a generic indicator framework. Indicator standardisation provides multiple benefits, but it is an area of research that has been largely ignored in the current literature. Context-specific adaptions could expand analyses to include integrated natural resource management, integrated soil fertility, pest and nutrient management, conservation agriculture, agroforestry, and many others.

RHoMIS forms a starting point for a grass roots community of researchers and development practitioners who aim to solve the targeting and monitoring challenge with data and information and ultimately help to increase the efficiency and effectiveness of development planning. As this is an emergent community, we are always seeking new ideas and partners to extend and improve our approaches.

Further Reading

- Hammond J et al. 2016. 'The Rural Household Multi-Indicator Survey (RHoMIS) for rapid characterisation of households to inform Climate Smart Agriculture interventions: description and applications in East Africa and Central America', Agricultural Systems, in press. DOI: 10.1016/j.agsy.2016.05.003
- Rosenstock TR et al. *in review*. Are we there yet? Tracking progress toward global targets. Current Opinion in Environmental Sustainability.

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