SPIA Activities Update
11 November 2015

This progress report provides an update on the Strengthening Impact Assessment in the CGIAR (SIAC) program since the mid-term review of the SIAC program which took place in Castel Gandolfo (Rome) in February 2015. As for the previous report, this document is organized around the Objectives spelled out in the SIAC program of work, with links to additional information.

Activity 1.1: Advance methodologies for tracking the uptake and adoption of improved varieties (MSU; SPIA)

Background for Activity 1.1
The objective of this Activity is to pilot test and validate alternate approaches to collect variety-specific adoption data against a reliable benchmark to determine which method/approach is the most cost-effective (i.e., which method provides a given level of accuracy at the least cost). The idea is to come up with 'lessons learned' and recommendations on methods / approaches that can be used in scaling up the collection and assembly of diffusion data on improved varieties. The following crop-by-country combinations were targeted:

1. Cassava in Ghana
2. Maize in Uganda
3. Beans in Zambia

Two further crop-by-country combinations were added to the SIAC portfolio by SPIA at the start of 2015, as part of the collaboration with LSMS-ISA:

4. Cassava in Malawi
5. Sweet potato in Ethiopia

1.Cassava in Ghana
Lead: MSU, Partners: IITA / Crops Research Institute / Agriculture Innovation Consulting / Cornell University

Background
This study tests the effectiveness of the following four household survey-based methods of tracking varietal adoption for cassava against the benchmark of DNA analysis of cassava leaf samples.

A. Elicitation from farmers by asking him/her the names of varieties planted and some basic questions for each variety planted.
B. Farmer elicitation on varietal characteristics by showing a series of photographs (or actual plants). This information will be later used by the analyst to identify varieties based on morphological characteristic data.
C. A trained enumerator recording observations on varietal characteristics by visiting the field and sharing their opinion on what the variety is (based on observations). The information collected will be also used by the analyst to identify varieties based on morphological characteristic data.
D. Enumerator taking photos of the plant in the field for latter identification by experts (i.e., breeders).

Field work was completed in late Fall 2013. All the samples collected from the farmers' fields and the 40 genotypes included in the 'reference library' were sent to IITA by the Ghanaian partners in January 2014. DNA extraction work for almost 1000 samples was completed by IITA and all the samples were shipped to Cornell for GBS (i.e., genotyping-by-sequencing). Data from the GBS analysis were submitted by Cornell to IITA in July 2014. Preliminary results of the data interpretation were presented by IITA at the DNA convening meeting held by the Gates Foundation in early August 2014.

Key results and outputs
The analysis of the effectiveness of different methods of varietal identification against the benchmark of DNA fingerprinting using several outcome indicators has been completed as of December 2014. Key emergent findings: a) there is a large variation in the estimates of adoption of improved varieties derived using different methods (A to D) tested in this study; b) errors of identification are in both direction – large numbers of samples mistakenly identified by farmers as improved when actually local and vice-versa; c) the methods of varietal identification that relied on 'experts' were better than the farmers' elicitation, but still deviated a lot

from the DNA fingerprinting reference. A presentation summarizing the main results of this case study along with the results of the bean study (case study 3, below) were presented at ICRISAT in June 2015 (upon their invitation during a visit by M. Maredia), at the AAEA meetings in July, and at the International Conference of Agricultural Economists (ICAE) in August 2015. A research paper summarizing the DNA fingerprinting methodology and results of this study was published in BMC Genetics (v. 16:115 DOI 10.1186/s12863-015-0273-1).

2. Maize in Uganda

Lead: SPIA, Partners: World Bank LSMS-ISA / Uganda Bureau of Statistics (UBOS) / National Crops Resources Research Institute, Uganda (NACRRI) / LGC Genomics Ltd / Diversity Arrays Ltd

Background

Since the last SPIA activity update, management of this study was transferred over from MSU to SPIA in March 2015. The context for the study is now a large methods experiment run by the World Bank LSMS-ISA team and UBOS on estimating maize productivity. The following three methods for varietal identification have been embedded in the design of the experiment:

A. Asking the farmer to identify the variety.
B. Asking the farmer to answer questions related to 15 phenotypic characteristics (using a visual aid), checked against sets of reference responses for each variety using alternative decision rules.
C. Focus group meeting with a number of experts.

These will be benchmarked against two DNA genotyping methods:

D. DNA fingerprinting using SNP markers on samples from maize leaf tissue.
E. DNA fingerprinting using GBS on samples from maize grain.

Field work for the whole survey took place over three visits to a sample of 900 households (post-planting; crop-cutting; post-harvest) over the period April 2015 – August 2015 in 5 districts in Uganda. For budget reasons, DNA fingerprinting was possible only on a subset of 550 farms in two districts – Iganga and Mayuge. Enumerators from UBOS were recruited and trained intensively for one month, and survey data collection was facilitated by the use of networked tablets for real-time data management and processing. Leaf samples were collected at the post-planting visit in April and May 2015, from within the quadrant laid down by enumerators for subsequent crop-cutting, using leaf collection kits from LGC ltd. Grain samples subsequently collected from these quadrants in the follow-up crop-cut visit in June and July 2015. SNP-based genotyping data was received from LGC in September 2015 following analysis of the leaf samples. Grain samples were processed (dried, ground to flour, labelled) by NACCRI in August and September 2015, and shipped to Diversity Arrays in Australia at the end of October 2015. Analysis of the matches for method B (between sets of 15 responses from each farmer, and possible combinations of 15 characteristics for varieties in the reference library) is currently being carried out.

Current status

In the first instance, we will explore the two methods for DNA fingerprinting to see how they compare. Once we decide which of the two approaches is preferred (and there are strengths and weaknesses to both) we will use this as a reference to compare the other methods for varietal identification. We will also have first-rate data on agricultural productivity, soil quality, varietal identification, and household characteristics. We can estimate some simple models for the determinants of productivity: once using the data that are typically collected in surveys, based on farmer testimony; and once using objective methods for varietal identification (DNA fingerprinting), yields (crop-cuts), soil quality (soil samples taken and analysed in laboratory). These results will help us understand more about the importance of data quality in context – does improved data quality substantially impact on our understanding of some fundamental issues in impact assessment? The leaf-based genotyping is partially complete, though we have had to re-grow the reference library from seed owing to errors in handling the leaf samples. The sequencing of the farmers' leaf samples is complete. Grain based genotyping will take place in November and December, with results for both fingerprinting methods expected in January 2016. All analysis is expected to be completed by May 2016.

3. Beans in Zambia

Lead: MSU Partners: CIAT / Zambia Agricultural Research Institute / LGC Genomics Ltd.

Background

The context for this study was a bean adoption study conducted by PABRA (Pan-African Bean Research Alliance). Seed samples and data corresponding to four methods, similar but not identical to the cassava in Ghana study, have been collected from 402 households that were surveyed under the PABRA study:

A. Elicitation from farmers by asking him/her some basic questions for each variety planted.
B. Showing the farmer seed samples representing different varieties and asking him/her to identify the sample that matches each of the variety grown on their farms.
C. Collecting seed samples representing each variety planted by farmers for latter identification by experts (i.e., breeders).
D. Enumerator taking photos of the seeds during the survey for latter identification by experts (i.e., breeders).

The accuracy of adoption estimates derived from the above four methods will be evaluated against the varietal identification established through DNA fingerprinting of seed samples collected from the farmers.

Seed samples and data corresponding to the four methods have been collected from 402 households that were surveyed under the PABRA study. MSU (Byron Reyes) visited Zambia to complete the varietal identification protocol using Methods C and D noted above. During this visit the team visited the local market (in Kasama) and collected some bean seed samples from local vendors. These seeds were added to the pool of seeds for DNA analysis to check if the seeds of varieties sold in the market as named by the 'vendors' match the actual variety as named and identified by farmers. The total seed sample (both collected from the farmers and from the vendors) to be analyzed in Zambia is about 900.

Current status

Comparing the two methods based on farmer elicitation, results indicate that there was only 25% agreement on the name of the variety planted between methods A and B. In the case of the two methods based on experts' opinion (i.e., methods C and D), there was close to 80% agreement on identifying the varieties either by name or by type.

The raw data from the SNP analysis were received from LGC Genomics Lab in May 2015. These data were shared with CIAT researchers for interpretation and a report of the data analysis was submitted by CIAT soon after. Based on these data and report from CIAT, MSU has completed the data analysis to test the effectiveness of different methods of varietal identification and results are being written up as a paper (both of which will be shared with SPIA by end of December 2015).

4. Cassava in Malawi

Lead: SPIA; Partners: World Bank LSMS-ISA / Malawian National Statistics Office / Malawi Department of Agricultural Research and Technical Services - Chitedze / Diversity Arrays Ltd

Background

The context for this study is a methods experiment led by Talip Kilic of the World Bank LSMS-ISA based around alternative approaches to estimating cassava production from households using diaries and different lengths of recall data. SPIA, through Research Associate John Ilukor, have embedded the following varietal identification approaches into the design of the experiment:

A. Asking the farmer to identify the variety.
B. Asking the farmer to answer questions related to phenotypic characteristics (using a visual aid), checked against sets of reference responses for each variety using alternative decision rules.
C. Focus group meeting with a number of experts.

These will be benchmarked against:

D. DNA fingerprinting using GBS on samples from cassava leaf.

Current status

Cassava leaf collection was integrated in the survey, along with a phenotypic protocol of traits, which was implemented starting June 2015 and is ongoing through a full calendar year. However, the leaf collection for

fingerprinting and phenotypic data for subjective identification, are complete. The reference library of varieties, and their corresponding phenotypic attributes, was compiled by the Malawian NARS. DNA has been extracted in-country by the Chitedze laboratory for samples from 1100 farms. Once the final 100 samples are received from the field, and DNA has been extracted, the entire set of plates will be shipped to Diversity Arrays in Australia for sequencing.

5. Sweet potato in Ethiopia

Lead: SPIA; Partners: World Bank LSMS-ISA / Ethiopian Central Statistics Agency/ Ethiopian Institute for Agricultural Research / Diversity Arrays Ltd

Background

This experiment was the initiative of SPIA Research Associate Frederic Kosmowski, working somewhat independently in Ethiopia with locally recruited enumerators and contacts through the NARS system in Ethiopia.

A. Asking the farmer to identify the variety.
B. Asking the farmer to answer questions related to phenotypic characteristics (using a visual aid), checked against sets of reference responses for each variety using alternative decision rules.

These will be benchmarked against:

C. DNA fingerprinting using GBS on samples from sweet potato leaves.

Current status

Data were collected in early 2015 from 278 farmers. Leaf samples were taken and DNA has been extracted by ILRI in Addis, and plates for sequencing are being sent to Diversity Arrays in November 2015. We are not expecting to find method B to be able to uniquely identify varieties. The reference library was collected by Frederic Kosmowski but is being complemented by sequencing accessions from the CIP genebank.

Overall (early) conclusions from Activity 1.1

- No single survey-based method stands out to be most effective on all measures considered (i.e., percentage of data points correctly identified as an aggregate group, and Type I and Type II errors when comparing the results of each data point).
- On aggregate level adoption of improved varieties, methods based on farmer elicitation and field observations by an expert (in case of cassava) and methods based on expert elicitation *ex post* of the survey based on photos or seed samples (in case of beans) provide closest estimates but with high error rate or low accuracy rates when outcome is compared for each data point.
- Identifying varieties accurately by NAME in a setting where hundreds of variety names exist is a challenge across all the methods tested.
- Adoption estimates by the experts (based on photos) are substantially higher than other methods and has much higher type I error (false positives).
- Eliciting varietal adoption from farmer surveys may not be an accurate method for measuring varietal turnover and variety specific adoption.
- All the methods evaluated are prone to both type I and type II errors which has implications for the accuracy of any adoption and impact analysis conducted using such data at the farmer level (more studies and analysis to test this hypothesis needs to be done).
- Given the time and logistics of implementing some of the non-conventional methods (such as those based on field observations and taking photos or collecting samples for post-survey analysis), the scalability of these methods remains questionable on the grounds of 'cost-effectiveness' and feasibility.
- DNA fingerprinting is a useful tool for determining the genetic identity of varieties grown by farmers; but several challenges related to the logistics, sampling methodology, cost, and capacity remain to be worked out.
- More studies on the application of DNA fingerprinting for different crops and country settings are needed to generate an experience base and deriving generalizable conclusions.

Activity 1.2: Advance methodologies for tracking the uptake and adoption of NRM technologies (MSU; SPIA with World Bank LSMS-ISA)

Background
The objective of this Activity is to identify alternate methods, including remote sensing and mobile phones to track and document NRM technology adoption at scale. Two pilot studies were funded under this Activity through a two-stage competitive call in early 2014:

1. Innovative use of mobile phone based applications in tracking adoption of Natural Resource Management Technologies in India (CIMMYT)
and
2. Hyperspectral signature analysis: a proof of concept for tracking adoption of crop management practices in Gazipur, Bangladesh (IRRI)

Current status
Final reports for the two studies were reviewed by SPIA and MSU, and comments shared with the authors who are now developing publishable outputs. A SPIA Brief based on the CIMMYT study is currently being drafted, and SPIA is clarifying with IRRI how the plans for repeat sampling in subsequent years are being developed. The overall results are positive with regards to the potential of using these innovative methods for tracking adoption of farm 'practices'. This is encouraging but there are several limitations of these pilot studies pointed out by the authors, and identified by the reviewers that need to be addressed. The shortcomings of these two pilots and some inconclusive results imply that more studies are needed and evidence need to be generated to test the external validity of these innovative methods.

3. Measuring adoption of conservation agriculture: A study in Ethiopia (SPIA, World Bank LSMS-ISA)

Background
Frederic Kosmowski (SPIA Research Associate based in Addis Ababa) has designed a study to test the following methods for collecting data on soil cover from crop residues – one of the pillars of conservation agriculture, and a source of significant controversy in Sub-Saharan Africa owing to poor data quality.

A. Enumerator asks the farmer to estimate the % soil cover in their plot
B. Enumerator uses photo aids to help the farmer estimate the % soil cover in their plot
C. Enumerator uses a drone to take an aerial photo of the plot which is then digitized and a % cover estimated
D. High-resolution satellite imagery
E. Enumerator lays a transect rope with knots which is used to estimate for the field (assumed reference)

Current status
Satellite imagery is being obtained and fieldwork will begin at the end of November and run for a month. This study will help us understand the extent to which survey-based data on soil cover is inaccurate relative to an objective reference, and also whether using drones or satellite imagery are viable alternatives. SPIA is also currently exploring the capability of the new generation of micro-satellites (e.g. Skybox) and how they are changing the outlook for using satellite imagery for these problems in future.

Activity 1.3: Innovative Approaches to Collecting Agricultural Technology Adoption Data (MSU-led)

Background
Most diffusion surveys in the past have depended on CGIAR research teams, either working on their own or working in collaboration with national programs and statistical services to generate the data. In many countries, there are private market research firms as well as private survey firms engaged in carrying out household surveys for academic purposes that could potentially do these kinds of surveys using cell phones thereby lowering costs significantly.

A call for proposals on this topic was issued by MSU with a focus on doing a case study in India. The call was issued on February 6, 2015 and targeted private (for profit or non-profit) entities. The goal is to fund innovate data collection project(s) in India to: (1) develop and pilot a cost-effective approach to collect diffusion data for

selected technologies; and (2) demonstrate in a rigorous way that the data from the pilot survey are accurate. MSU's role is to provide technical assistance and work with selected partners to ensure the design of the pilot study meets methodological rigour. Six expressions of interest were received and three were selected as follows:

Proponent	Focus districts	Technology	Crop	Proposed approach
Synergy	Haryana (Karnal) and Bihar (Vaishali)	Zero till; Direct seeded rice; and LLL	Wheat-rice based farming systems	The use of Local Experts (LE) selected from groups such as local input dealers, local CSC (Common Service Centre) operators, e-Mitra Seva Kendra operators, private school teachers etc.
CASPL	Haryana (Karnal) and Punjab (Ludhiana)	Zero till; Direct seeded rice; and LLL	Wheat-rice based farming systems	Use of e-Enumerators and e-Supervisors residing in rural areas, each in-charge of collecting data from 5 villages
Nathan	AP (Anantapur and Kurnool)	ICRISAT promoted NRM technologies (15 different types of soil and water conservation technologies)	Groundnut based farming system	Using Civil Society Organizations as key partners in data collection and quality control; their field staff would act as local enumerators and collect data from a set of resident farmers and input into the smart phone/computer for onward transmission

Status
Data sets and field reports from all three studies are expected by the end of November 2015. To validate the estimates of technology adoption to be obtained from the three pilot studies, MSU is conducting representative surveys in the 5 study districts by using a more 'traditional' approach. This approach consists of working with a competitively-selected survey firm in India to help with the logistics of doing data collection. The difference between these data and those from the three survey firms is that the questionnaire and sampling design were developed by MSU with little involvement of the contract survey firm.

Results / Outputs
All data collection for the validation surveys will be completed by mid-November and data will be ready for analysis from December 2015 and results of the pilot studies, including the 'validation' of results will be completed by March 2016.

Activity 1.4: Develop and disseminate best practices for collecting diffusion data (MSU-led)

No activity was planned for 2015. MSU will be organizing a workshop to bring together results/learning from 1.1, 1.2, and 1.3 in 2016.

Activity 2.1: Filling gaps in the global database on adoption of improved varieties (MSU-led)

Background
This activity adds to the recently completed DIIVA and TRIVSA projects to fill out gaps in the coverage across crop-country combinations (CCCs) for which we have data on adoption of improved varieties. Six institutes have responsibility of different shares of the total number of 130 CCCs (as outlined in the table below).

Current status
Centers have made significant progress in completing the data collection for their targeted numbers of CCCs. Table 1 provides a summary on the work accomplished and still pending towards completing data collection for the two databases (varietal release and varietal adoption). Overall, data collection to compile the two databases has been completed for 85 out of 130 CCCs to be covered by this Activity.

Table 1. Data collection status by Centers, as of the end of August 2015

Center	Total mandated CCCs	Data collection in mandated CCCs		
		Completed	To be completed	Percentage completed
CIMMYT	40	40	0	100%
CIAT	10	10	0	100%
IRRI	21	17	4	81%
ICRISAT	15	4	11	27%
CIP	41	12	29	29%
MSU	3	2	1	67%
Total	130	85	45	65%

MSU, in consultation with SPIA has identified the four CCCs for doing validations of adoption estimates to be derived using expert elicitation method or secondary data sources. Two methods will be used for validation—estimating adoption using representative farmer surveys and DNA fingerprinting on all or a sub-set of seed samples. The four CCCs identified for validation of Activity 2.1 work are:

- Wheat in Bihar (state level)
- Lentil in Bihar (state level)
- Cassava in Vietnam (country level)
- Rice in Lampung Province, Indonesia (province level)

ICRISAT plans to organize the elicitation workshops in the remaining 11 CCCs over the period October and November 2015. CIP has submitted a revised timeline for completing the data collection and expert elicitation in the remaining 29 CCCs (plus Bhutan) in early 2016, and submitting all the deliverables by mid-April. CIP requested a no-cost extension to complete these tasks. To complete the data synthesis, organization, and submission of the deliverables MSU has for this Activity, MSU requested a no cost extension for the SIAC Phase 1 LOA till July 31, 2015, which was approved on a no-objection basis in September 2015.

Activity 2.2: NRM research direct outcomes (SPIA)

Background

The primary objective is to use a multiplicity of approaches (desk review, personal interviews of scientists at CGIAR, expert opinion, carefully-timed farmer surveys, frontier technology like remote sensing or drones, and qualitative methods including stakeholder interviews) to estimate current levels of adoption for a number of high-priority NRM practices. Similar to other SPIA/SIAC efforts on documenting the adoption of improved varieties, the goal with this work is to demonstrate the viability of systematically tracking and documenting the outcomes from NRM research.

Current status

SPIA issued a call for expressions of interest on 26th October 2015 for institutions who would like to attend a workshop in December 2015 at which SPIA will put together workplans for 2016-17 on collecting adoption data on a number of priority NRM-practice combinations as outlined in the table below. The workshop, to be held in Rome and involving colleagues from FAO, IFAD and up to 20 representatives of institutions will be structured around developing specific projects for subsequent implementation under this activity.

Priority NRM practices	**Priority countries**
Agroforestry (particularly "fertilizer trees", leguminous fodder shrubs)	Kenya, Zambia, Zimbabwe, Rwanda
Alternate wetting and drying (AWD) in rice production systems	China, Vietnam, Philippines, Indonesia, Myanmar, Bangladesh
Conservation agriculture in maize-based systems	Zambia, Zimbabwe, Mozambique, India, Pakistan, Nepal, Bangladesh, Kyrgyzstan, Uzbekistan, Tajikistan, Turkmenistan, Kazakhstan, Iraq, Mexico
Cocoa integrated crop and pest management (ICPM)	Cameroon, Cote d'Ivoire, Ghana, Liberia, Nigeria

Micro-dosing of fertilizer in maize-based systems	Kenya, Zimbabwe, Mozambique
Integrated soil fertility management	Kenya, Rwanda, Burundi, DRC

James Stevenson represented SPIA in a workshop held in Cairns, Australia on assessing the effectiveness of landscape level interventions in June 2015. The consensus in the group was that there is too little attention paid to demonstrating whether, and under what circumstances, a landscape scale approach is beneficial and will bring about impact. A paper, led by Jeff Sayer, is being drafted and should be published in early-mid 2016.

Activity 2.3: Database on policy-oriented research outcomes (SPIA)

Background
This is a part of the SIAC activities that aim at generating core data on the diffusion of CGIAR-generated technologies and policies (see 2.1 and 2.2): 2.3 focuses on outcomes of CGIAR policy-oriented research that have influenced significant policy changes related to agriculture, food and nutrition at the regional, national or global level. The goal is to compile and make available to CGIAR stakeholders the best available information on outcomes that are, at least plausibly, attributable to CGIAR policy research outputs.

In the first phase completed in 2014, a consultant (Mitch Renkow) drew on earlier CGIAR PMS data files from 2006 through 2010 to compile a list of 93 POR outcomes. For each outcome, information is provided on the constraint or problem that was addressed, the key research outputs underpinning the outcome, a description of the specific POR outcome itself, what supporting evidence exists, and the region or country in which the outcome took place. Sixty-one of these were deemed to be Category I "strong" cases – ones that satisfied specific criteria. In addition to the 61 strong outcomes, there were 32 other outcome statements that were deemed to have significant potential but required further documentation. Of these 32 "non-strong" outcomes, seventeen were judged to require additional evidence linking the outcome to specific Center outputs. In other words, it was felt that the existing outcome statement provided insufficient information to make a compelling case that the policy outcome could be reasonably attributed to the Center. Fifteen additional statements described outcomes that look promising, but either were at an early stage (e.g., they described early outcomes emanating from pilot projects), or were simply not described well enough to make a strong case for being a POR outcome – but, again, appear to have good potential to generate meaningful policy outcomes.

Current status
Phase 2 is currently ongoing (commenced in May 2015) and is again led by Renkow with two objectives: (1) updating the POR outcomes inventory for 2010 through 2014 through a careful review of websites, annual reports and other relevant documents published by Centers and CRPs; and (2) offering Centers the opportunity to verify earlier submitted information or provide updated information to substantiate or modify earlier claims (by sharing the Phase I inventory).

At the end of October 2015, Renkow submitted to SPIA the updated inventory with potentially viable outcomes that might be reasonable candidates for inclusion. In addition, Renkow is presenting a paper on 'assessing the impact of policy-oriented research in the CGIAR: methodological challenges and reasonable expectations' that is being presented at the International Conference on Impacts of Agricultural Research – Towards an Approach of Societal Values (French National Institute for Agricultural Research INRA, Paris, November 304 2015). The paper offers a critical assessment of efforts by the CGIAR and kindred national agricultural research institutions to evaluate the welfare impacts of policy-oriented research conducted under their auspices.

In Phase 3 (in 2016), SPIA will initiate an external validation process of POR outcome claims assembled under Phases 1 and 2.

Activity 2.4: Long-term institutionalization of adoption data collection (MSU; SPIA with World Bank LSMS-ISA)

Background
This activity contributes to SPIA's long-term vision of involving a broader and more diverse set of institutional partners in the collection of adoption data. SPIA's long-term vision in achieving this objective is to involve a broader and more diverse set of national institutional partners in the collection of adoption data so as to

systematize the collection of nationally representative data (on a regular basis) in the most cost-effective way possible. MSU is working in India, Mozambique and Zambia to explore the integration of technology adoption data into existing surveys. On a parallel track, SPIA is working with the World Bank Living Standards Measurement Study – Integrated Surveys of Agriculture (LSMS-ISA) team through two researchers – Frederic Kosmowski and John Ilukor.

1. India (MSU)

The initial efforts (meetings and discussions) focused on ICAR to leverage existing data or future data collection efforts (cost of cultivation data) for the purpose of tracking and monitoring the adoption of improved varietal technologies (and any other technologies, if data are available) by farmers on a regular basis. While there was some initial interest, subsequent interactions suggested that ICAR did not have institutionalized data collection mechanism in place to integrate this data, and a better target for such efforts might be the Ministry of Agriculture or National Sample Survey Organization (NSSO) or to try and work at the state level (in 1-2 states) and see if the Department of Agriculture in a given state is open to this idea of institutionalizing the collection of technology adoption data at least on a pilot stage.

Since the SIAC update in February 2015, Mywish Maredia traveled to Odisha, India, in May 2015 for a day, and visited the Department of Economics and Statistics for the State of Odisha to find out more about the types of agricultural data being collected at a state level. From this visit and the desk review of questionnaires used to collect different types of data through surveys that are routinely conducted (such as the crop cut experimental data, input surveys, agriculture census surveys and NSSO surveys), the emerging conclusion is that India is a data rich country. There is an impressive amount of data being routinely collected (many at representative scale), and all these efforts are already institutionalized within the government system. However, despite these efforts, the fact remains that it is not easy to get an overall representative picture and trend of the adoption of different types of agricultural technologies that are generated by the Indian research system (and the collaborating CGIAR centers) due to a number of reasons, including government confidentiality laws.

Due to these characteristics of the way data are collected, processed and reported in India, there is limited utility of these data for tracking technology adoption at a representative scale. There is certainly room for improvements in this data system, but a local institution or a research center needs to champion this cause. The goal would be to make some changes in the institutionalized data collection system so that the data collected using public resources can serve the research and monitoring needs of the agricultural research communities. MSU has initiated a conversation along these lines with the National Institute of Agricultural Economics and Policy Research (NIAP/ICAR), and will continue to pursue these efforts: NIAP/ICAP Director has written to the Secretary of Agriculture to make household unit level data available to researchers, and intends to approach the Chairman of the Statistical Commission.

2. Mozambique (MSU)

MSU has liaised with the Directorate of Economics and Statistics (DEST) within the Ministry of Agriculture and Food Security (MINAG) that is responsible for producing official agricultural statistics. The Integrated Agricultural Survey (IAI) is a routine data collection effort – representative at the provincial level – and done every 1-3 years. MSU reviewed the IAI survey instruments and provided feedback on integrating some technology specific questions in different sections of the survey. While DEST plans to conduct a "light" round of IAI this year and is unable to incorporate these suggestions in its entirety, some were taken on board. They have also expressed interest in testing new methods of tracking adoption of varietal technology, especially using DNA fingerprinting, and MSU will continue to discuss these options with them.

3. Zambia (MSU)

MSU reviewed the Crop Forecast Surveys (CFS) that is conducted annually by the Ministry of Agriculture & Livestock and Central Statistical Office. This survey is representative of small and medium scale holdings at the country level. Suggestions for modifications and addition of a one page section on the adoption of conservation technology were made to the CFS coordinator – this was pilot tested in February 2015, but was not implemented in the March-April round of CFS due to time constraints (increased survey length and time). However, the team has agreed to integrate a page of questions in the second follow-up round (post-harvest season in September-October). During a recent visit to Zambia (on another project), MSU (M. Maredia) visited the Ministry of Agriculture and Livestock to get an update on this activity. All data collection has been completed and currently undergoing data entry and cleaning. Once the data are cleared by the Central

Statistical Office, it will be shared with MSU and broader research community to assess the adoption of conservation technologies at the national level.

4. Ethiopia (SPIA and World Bank LSMS-ISA)

Background

The third wave (2015/16) of the Ethiopia Socioeconomic Survey (ESS) presents an opportunity for integrating a number of questions related to the adoption of CGIAR-related agricultural technologies. The ESS is a nationally representative survey of 4,000 households, and is managed by Central Statistics Agency (CSA) via a network of some 300 resident enumerators.

Current status

SPIA were able to incorporate questions into the ESS for the following technologies:

- Orange-fleshed sweet potato
- Awassa variety sweet potato
- Crop rotation in previous three years
- Treadle pump
- Motorised pump
- Desi / Kabuli type of chickpea
- Weather index insurance
- Broad-bed maker
- Improved livestock feed module

Data collection is ongoing, but we can expect to have access to the data by mid-2016 – ahead of the formal release in 2017.

5. Uganda (SPIA and World Bank LSMS-ISA):

Background

The Annual Agricultural Survey (AAS) is a new survey funded by the Ugandan government and implemented by the Ugandan Bureau of Statistics. The survey instruments will be pre-tested in the second season of 2015 and the main survey will start in 2016.

Current status

SPIA were able to incorporate questions into the AAS for the following technogies:

- Bean varieties
- Cassava varieties
- Maize varieties
- Sweet potato varieties
- Sorghum varieties
- Agroforestry
- Livestock
- Conservation agriculture

In Uganda, the fourth wave of the Integrated Household Survey (the true LSMS-ISA panel survey) is planned for 2016. The details are not yet out from the LSMS team or UBoS but the training is likely to start in March and fieldwork could start in March-April. If successful in the AAS, there is the possibility that some of the questions will be incorporated in the panel survey.

6. Malawi (SPIA and World Bank LSMS-ISA):

In Malawi Integrated Household Survey 4 (LSMS-ISA panel survey) is planned for 2016. The training will be in February and fieldwork starts in March. World Bank is currently working on internal revisions to instruments together with National Statistical organization of Malawi and will be sending out the questionnaires to a much larger group of experts shortly, for input on priorities in much the same way as for Uganda.

Activity 3.0: Nutrition impact assessment studies (SPIA - Erwin Bulte)

Background

This call, led by Erwin Bulte at Wageningen University, aims to generate evidence of the impacts of a range of agricultural technologies on nutrition and health. A final workshop will take place in mid-late 2016.

1. Adoption of high iron bean varieties in Rwanda (CIAT, Harvest Plus, Virginia Tech, Rwanda Agricultural Board)
SPIA is expecting a progress report this month but don't anticipate significant problems after the team resolved an early administrative issue with the Rwandan government.

2. Shortening the hungry season through NERICA in Sierra Leone (IPA, MIT, Sierra Leone Agricultural Research Institute)
This project has been granted a one-year no-cost extension owing to disruption caused by the Ebola outbreak in the country in 2014. The final report is now expected at end of December 2016. Early results show that children in households in that received NERICA seed (either for free or at 50% or 100% of market price) AND agronomic training on how to grow it, see positive effects using anthropometric measures that persist up to the beginning of the next hungry season. The coefficients for the same measures for the group that did not receive training but did have access to NERICA at the same fractions of market price are positive, but not statistically significant and much smaller than those on the treated and trained group at the end of the hungry season. Previous studies by the same authors have shown that NERICA is susceptible to crop failure when not grown under correct agronomic conditions, and these findings would suggest that farmer training may be a necessary condition for achieving certain development outcomes with NERICA.

3. Crop diversification for food and nutrition security in Malawi and Ethiopia (CIMMYT, Lilongwe University, Georg-August-University of Goettingen, Ethiopian Institute for Agricultural Research)
The progress report received in August 2015 included a draft of a paper for Ethiopia that has evidence that the joint adoption of crop diversification and modern varieties has higher impacts on calorie, protein and iron consumption and diet diversity than adopting each practice in isolation. Results from Malawi are expected in mid-2016.

4. Looking beyond income: impact of dairy hubs on nutrition in Tanzania (ILRI, Emory U., Tanzania NARS)
SPIA remains concerned about this study owing to a lack of clear strategy for counterfactual analysis and there has been a series of email exchanges between SPIA and ILRI over the last several months. SPIA will receive a further progress report later in November, and Erwin Bulte will decide at that point whether he needs to visit ILRI to sort out a strategy for concluding the study in the most appropriate manner.

5. Nutritional impacts of irrigated horticulture in Senegal (Columbia U., George Washington U., MDG Center)
This project got off to a slow start but was underway in early 2015 and the first progress report is due at the end of January 2016.

Activity 3.1: Long-term / large-scale impact assessment studies (SPIA - Bob Herdt)

Background
Through this call, SPIA aimed to fund studies that seek to measure the impacts of widely-adopted CGIAR research related innovations. Estimating the direct and indirect impacts from widely-adopted CGIAR-related technologies and policies is of special relevance to CGIAR donors and stakeholders, particularly in a climate of high accountability and expectation of linkages between agricultural research investments and socially desirable outcomes.

Status
Seven studies were funded out of the 12 full proposals received (8 impact + 4 adoption studies) in January 2015. Since the last SPIA activity update in February 2015, an inception workshop for the set of studies selected was held in July 2015 at IFPRI, DC. The workshop had a two-fold objective: (1) to provide specific feedback on technical and operational aspects of the funded studies, and (2) to provide an opportunity for participants to exchange views on the operational and data-related aspects of long-term, large-scale studies of CGIAR research impact studies – for instance, lessons from DNA fingerprinting work to estimate varietal diffusion; reflections on using micro data for macro analysis; and challenges in sampling and extrapolation for such studies.

The selected studies are as below:

1. **Adoption and Diffusion of C88 Potato Variety in China: Spatial Variability of Productivity Gains and Cost Savings and Value Chain Development** (CIP, Virginia Tech, and Yunnan Normal Univ)
2. **Estimating Improved Tilapia Adoption Using DNA Fingerprinting: Philippines and Bangladesh** (WorldFish)
3. **Adoption of improved lentil varieties in Bangladesh: comparison between expert estimates, nationally representative farm household survey and DNA fingerprinting** (ICARDA and Virginia Tech)
4. **A Systematic and Global Assessment of the impact of CG technologies on Poverty** (IFPRI and World Bank)
5. **Using Global Agricultural, Health and Demographic Datasets to Identify the Impacts of CGIAR's Modern Seed Varieties Since 1960s** (UC San Diego and George Washington University)
6. **Influence of IFPRI's Research Results on Intra-household Decision-making and Gender Roles in the Field Programs of Large NGOs** (TANGO)
7. **Assessing the Impacts of Improved Cassava Varieties in Nigeria** (IITA)

All these studies are underway and six out of seven will be completed by the end of 2016.

Activity 3.2: Micro-scale impact studies using experimental and quasi-experimental methods (SPIA – Karen Macours)

Background

Led by Karen Macours at the Paris School of Economics, this call was launched in mid-2014 and three studies were contracted between Nov 2014 and January 2015. An inception workshop for the studies was held at MIT in February 2015.

1. A Multiple Intervention Approach to Increasing Technology Adoption with a View Towards Scaling-up: Evidence from Mexico (QFD Mexico, UC Berkeley, ITAM, World Bank)

Work on the SPIA-funded aspects of this project began in January 2015 and a progress report was received by SPIA in October 2015 which shows that the recruitment of 1000 farmers into the experiment went as expected, and gives early results on the uptake of technologies as varying with different promotion treatments. Full results are expected by July 2016.

2. Drought resistance and water saving in rice production in Bangladesh (UC Berkeley, Tufts, IRRI)

Work on this project began in May 2015, and the first progress report is due in January 2016.

3. Social networks to promote new agricultural technologies in Nepal (Yale, ICMIMOD)

This project experienced significant delays due to the Nepal earthquake in April 2015. SPIA is still working with the lead researchers to establish the implications of the earthquake for the experiment, as the SPIA component was for additional survey rounds of an existing experiment which began in 2014. We don't yet have revised a timeline for implementation but hope this can be established by the end of November.

Activity 3.3: Under-evaluated areas of CGIAR research (SPIA – J.V. Meenakshi)

Background

There are two parts to this activity: (1) as an initial step in the SIAC work on under-evaluated areas of CGIAR research, commissioning of critical reviews of the impact assessment work-to-date on specific research areas (irrigation, livestock, agroforestry etc.); and (2) a wider call for ex-post impact assessments to document the adoption and the direct impacts of CGIAR research (e.g. reduced water usage for irrigation or improved yield), and where possible, poverty, social, and environmental impacts of these innovations.

Status

Since the last SPIA activity update in February 2015, a SPIA Brief (#49) on the Merrey review on irrigation and water management research IAs was published in May 2015. In March 2015, two consultants (Sam Jutzi and Karl Rich) were commissioned to evaluate the extent and quality of *ex-post* impact assessment activity on livestock related research in the CGIAR to-date (ToR here).

For the second part of this activity, a call for EoIs (led by J.V.Meenakshi) was published on 11th June 2015 for impact assessments of under-evaluated areas of CGIAR research, including irrigation & water management;

livestock; agroforestry; biodiversity; policy and social science; and natural resource management (NRM). In August 2015, 26 EoIs were received and after SPIA internal review, 10 were invited to submit full proposals by October 25th October 2015. These full proposals have now been received, and will be externally/internally reviewed. There will be a PSC meeting in the first/second week of December 2015 (Doodle poll currently open, to establish preferred date) to discuss proposals, reviews and request decisions.

Results / Outputs

The draft report on livestock IA review has been submitted, and post internal and external reviews (by end of October 2015) will be revised by the two authors, and a Brief will be generated. Both reports highlight areas where there are gaps in evidence base on impacts from CGIAR research investments (in livestock and irrigation and water management).

Activity 4.1: Small grants (SPIA)

Four projects were funded through the small grants program (a total of US$30K). The plan is to reflect on lessons (and relevant study results, if any) from this (discontinued) activity in the SIAC synthesis report – drafting of which will commence in November 2015.

Activity 4.2: Strengthening IA capacity in the CGIAR through new partnerships (Virginia Tech with CIP and CIFOR; Univ of Illinois with ICRISAT)

Two collaborations were funded through this activity to build capacity in the CGIAR to conduct highly credible *ex post* impact assessments:

1. Virginia Tech with CIFOR and CIP

Virginia Tech has continued working with CIP and CIFOR on proposed activities, including pilot impact assessments. While the initial plan was to hold a final synthesis workshop in November 2015 and submit a formal report by March 2016, Virginia Tech has requested a one-year no-cost extension. SPIA has proposed a potential revised timeline (final report by November 2016), and is waiting for a formal report on progress and justification for extension request.

2. ICRISAT and University of Illinois

In September 2015, a multi-center workshop on advanced methods in impact assessment was held in Nairobi (hosted by ICRAF). The objective of the workshop was to raise the standards of impact assessment approaches and promote their application by social and bio-physical scientists at the CGIAR Centers. The agenda was based around the range of econometric tools available for impact evaluation. After the workshop, University of Illinois researchers and SPIA Secretariat met briefly to reflect on the workshop, and SPIA will continue to liaise with the researchers on some of the suggestions that came up as a result (e.g. discussion board where IA questions can be raised, archive of workshop materials online for reference etc.). In general, judging by participation rates, the workshop was a success: while University of Illinois/ICRISAT were hoping to attract 25 participants, they received 52 applications (including from NARS partners), and accepted 38 applicants to attend the workshop representing 10 CGIAR Centers. Agenda, learning materials, and a formal summary will be posted on the SPIA website shortly.

Activity 4.3: Biennial conference on ex post impact assessment results and methods (SPIA)

Since the last SIAC update, no Impact Assessment Focal Point (IAFP) meetings have been held. However, SPIA intends to hold a joint workshop for activities 3.0, 3.1, and 3.2 in Boston in late July 2016 – prior to the Annual Applied Economics Association meetings. The intention is that impact assessment focal points will attend this mid-term workshop at which they will have an opportunity to discuss their IA work/challenges to their IA work and be given an opportunity to collaborate with researchers outside the CGIAR system.

The Independent Evaluation Arrangement (IEA) is holding an Evaluation Community of Practice (ECoP) in November 2015 in Rome, and SPIA staff will participate in the workshop and ensuing discussions (there is some degree of overlap between representatives to SPIA and IEA communities of practice).

Activity 4.4: Enhancing quality and rigor: Introducing a Star Rating System for IA studies (SPIA)

While the Editorial Manager (a typical journal management platform) was customized and launched by SPIA and Allen Press as of February 2015, the activity has not progressed further, even if discussions on approach to quality rating and criteria to be used have continued (criteria has been revised further). In November 2015, SPIA will formally launch the platform and the quality rating exercise inviting submission of papers for external review and rating.

Activity 4.5: CGIAR Impact Website (SPIA)

The Impact website continues to get maintained and updated with information on new calls for proposals and blog entries. A (private) discussion board page will be added to facilitate interactions between impact assessment scientists at CGIAR Centers/CRPs in relation to activity 4.2 (Univ. of Illinois workshop outcome) in November/December 2015 – and, depending on the level of interest shown, the page will continue to be maintained/discontinued.

ANNEX: Summary of SIAC Program budget - 4 year totals (2013 – 2016), by activity by donor

		Budget 2013-2016			
Objective / Activity		**BMGF**	**W1**	**ISPC**	**TOTAL**
1+2	MSU Objective 1 and 2 contract	2,968,897	649,550	0	3,618,447
1+2	**Innovative methods for adoption / diffusion data collection**	**2,968,897**	**649,550**	**0**	**3,618,447**
2.2	Technology-country estimates of NRM adoption	413,072	1,061,764	4,165	1,479,001
2.3	Database on policy-oriented research outcomes	0	52,236	6,250	58,486
2.4	Long-term institutionalization of outcomes data collection	191,287	380,384	177,250	748,921 *
2	**Institutionalization of adoption/diffusion data across research areas**	**604,359**	**1,494,384**	**187,665**	**2,286,408**
3.0	Nutrition and Health ex-post IA studies	0	748,195	6,040	754,235
3.1	Long-term large-scale ex-post IA studies	320,839	459,374	236,821	1,017,034
3.2	Short-term, micro-level IAs with exp. and quasi-exp.methods	503,785	142,719	520,729	1,167,233
3.3	Ex post IAs of under-evaluated areas	333,919	628,450	181,958	1,144,327
3.5	System-level synthesis/meta-analysis of CGIAR IA studies	0	0	57,827	57,827
3	**Assess the full range of impacts from CGIAR research**	**1,158,543**	**1,978,738**	**1,003,375**	**4,140,656**
4.0	Cross-cutting support for Objective 4	0	0	44,212	44,212
4.1	Small grants program	0	0	30,000	30,000
4.2	Targeted capacity-building (with universities)	237,070	0	286,125	523,195
4.3	Conferences / workshops on impact assessment	0	5,000	42,646	47,646
4.4	Quality ratings of impact assessments	0	0	22,500	22,500
4.6	Significantly enhance the http://impact.cgiar.org website	0	0	80,623	80,623
4	**Developing an impact assessment community of practice**	**237,070**	**5,000**	**506,106**	**748,176**
O1	Financial management (Consortium)	68,465			68,465
O2	Administrative coordination (ISPC)	0	264,879	72,025	336,904
O5	PSC members to individual Activity meetings	0	0	36,490	36,490
O6	ISPC secretariat travel to individual Activity meetings	0	5,444	46,656	52,100
O7	Internal Review/Donor Surveys	0	0	50,000	50,000
O9	External review of the impact and influence of SIAC project	0	51,523	0	51,523
O11	Supplies, communication, printing, computer etc.	0	3,799	21,250	25,049
O	**Oversight, Management and M&E**	**68,465**	**325,645**	**226,421**	**620,531**
-	**TOTALS**	**5,037,334**	**4,453,317**	**1,923,567**	**11,414,218**
-	Total indirect costs	206,672	22,500		
-	**GRAND TOTALS**	5,244,006			**11,620,890**

* Budget includes activities carried out by SPIA in support of Act. 1.1, 1.2 and 2.4.