

Trip Report on Preliminary Visit to Benin in January, 2015

Prepared by Michael Agyekum

Visit to Benin; January 29-February 13, 2015

Transcript of Activities, Information Gathered, and Notes from Personal Communications

DATE	ACTIVITY	NOTES/OBSERVATIONS	PERSONNEL INVOLVED
Wednesday, January 28, 2015	Travelled from Kumasi, Ghana to Accra, Ghana		Michael Agyekum
Thursday, January 29, 2015	Travelled from Accra, Ghana to Cotonou, Benin		Michael Agyekum, Andre Hessouh
Friday, January 30, 2015	1.) Changed hotel: moved from IBIS Hotel to Residence Kafu. 2.) I met with the Biocontrol team (Manu Tam and Elie Dannon) to discuss my Workplan and confirm/modify schedules for the following week.	1.) Residence Kafu had cheaper rates and their location closer to the IITA Station in Cotonou.	1.) Michael Agyekum, Andre Hessouh, Manu Tamo, an IITA driver. 2.) Michael Agyekum, Manu Tamo, Elie Dannon.
Saturday, January 31 to Sunday, February 1, 2015	I started drafting a survey instrument to serve us interview guide during field visits.	Questionnaire is a draft and needs more input.	Michael Agyekum
Monday, February 2 through Friday, February 6, 2015	DAY 1: I had a familiarization tour of the Biocontrol Unit's insectarium. Dr Elie Dannon walked me through isolation lab facilities where a couple of biological control agents (parasitoids) for <i>MARUCA VITRATA</i> are being kept under strict surveillance. 2.) A meeting was held with the biocontrol team to discuss issues of concern to them as the economics team prepares to carry out the baseline study.	DAY 1: 1.) The Biocontrol team appears set for the first confined experimental releases of the parasitoids under screenhouse conditions, from March-April. 2.) A.) Experimental release of parasitoids under screenhouse conditions (at the IITA Station) is expected in April. In preparation for the ultimate field releases (may be scheduled after June, possibly in September, 2015), the biocontrol team will meet farming communities and 'sensitize' them about the planned releases of biological pest control agents. To facilitate establishment of the biocontrol agents after the field releases, farmers will be encouraged to avoid synthetic pesticides in favor of biopesticides. The team will assure compensation packages for any yield losses that may be suffered due to high pest pressure. <u>Expected Difficulties:</u> The biocontrol team is uncertain about how long it will take the parasitoids to establish in the field and spread spatially. B.) The biocontrol team is also interested in knowing the following from the baseline study: (i) What are farmers' opinions on <i>MARUCA VITRATA</i> ? Are farmers aware that <i>MARUCA VITRATA</i> destroys both cowpea flowers and pods? (ii) Farmers' yield comparisons between synthetic pest control methods and biological pest control strategies.	DAY 1: 1.) Michael Agyekum, Elie Dannon, and Manu Tamo. 2.) Michael Agyekum, Elie Dannon, and Manu Tamo.

	<p>3.) I had the first Skype Meeting with the Economics team to discuss important issues to focus on while I was in Benin.</p>	<p>3.) The team agreed on the need to focus on the following: A) continue identifying sources of data and other information relevant to the economic analysis (population-based agricultural data/statistics for Benin, previous surveys in French or local languages, etc.). B) biological/ecological data needed from the biocontrol team in order to help the economics team understand parasitoid-host-environment dynamics. C.) assessment of phone and internet communications quality in rural areas, during field visits.</p>	<p>3.) Michael Agyekum, Cynthia Donovan, Kathy Baylis, Loredana Horezeanu, and Elie Dannon.</p>
	<p>DAY 2: I met with Eustache Biaou, a sociologist at INRAB (National Agricultural Research Institute). Eustache has worked with cowpea farmers in Benin on a couple of projects, including PRONAF. He has dealt with farm households mostly in the Cuoffo Department. Also, Eustache works with several extension agents who can provide information on farm household's behaviour concerning biopesticides application. My discussions with Eustache centered on existing pest control strategies used by farmers, as well as existing information on cowpea farmers in Benin.</p> <p>Later in the day, I had an appointment with Dr. Ousmane Coulibaly, an agricultural economist at IITA and an expert in the cowpea sectors in Benin and the West African sub-region. In our interaction, I asked for information concerning existing knowledge on cowpea and farming systems in Benin. Dr. Coulibaly suggested that I speak with Dr. Patrice Adegbola at INRAB and Dr. Razack Adeoti who is also an agricultural economist at the IITA station in Benin.</p>	<p>DAY 2: 1.) Plant-based biopesticides are not as effective against cowpea pests compared with synthetic pesticides. Therefore, farmers have to apply larger doses/volumes, and more frequently before harvest. 2.) Some farmers combine both synthetic and biopesticide pest control methods. However, farmers typically apply biopesticides to portions of the farmland (crop) where harvests are meant for the household's own consumption. Interestingly, harvests from cowpea fields treated with synthetic pesticides are mostly sold. This indicates that farmers are aware of the adverse health effects associated with exposure to synthetic pesticides residue in foods. 3.) The common biopesticides are extracts from Neem seeds, and pawpaw leaves. 4.) Although farmers would prefer to use biopesticides only, one major challenge (aside from efficacy issues) is that home preparation of biopesticides is tedious/labor-intensive. Therefore, farmers would be happy to purchase already-packaged biopesticides because that will be more convenient (and amenable) to use on a large scale. 5.) In addition, commercially packaged biopesticides must be sold at cheaper prices to encourage farmers to use them more. 6.) Lists of farmers and farmer groups exist in Benin that can be used as sampling frame for the baseline survey. However, most of the available lists cover only participants in previous cowpea projects, particularly PRONAF. With the help of extension agents (Eustache can provide contact information for the extension agents), we can obtain these lists. Also, most farmers belong to credit unions; hence sample frames may be available through these associations. 7.) Finally, Eustache provided a folder containing reports and papers that may be useful for this cowpea IPM project. This Folder is shared on Dropbox with the economics team.</p>	<p>DAY 2: Michael Agyekum, Eustache Biaou, Elie Dannon.</p>
	<p>DAY 3: I embarked on a field visit to the Oueme Valley to interact with key informants identified by an IITA field technician. In all, we spoke with 3 farmers.</p>	<p>DAY 3: 1.) Farmers perception/attitude toward natural pest control strategies (such as biocontrol agents and biopesticides) is positive in the sense that they are aware of adverse health effects posed by exposure to</p>	<p>DAY 3: Michael Agyekum, Elie Dannon, an IITA Field assistant and a driver</p>

		<p>chemical pesticides.</p> <p>2.) Also, farmers indicated that fishing is important in the valley during the major season (late March-July) when the valley is flooded. Therefore, synthetic pesticides negatively affect their catch.</p> <p>3.) Farmers perceive cowpea grain harvests from synthetic pesticides as greater than that of biopesticides because synthetic pesticides are more effective against pest pressure, and kills pests instantly thereby guaranteeing harvests (i.e. low risk of losing yield or total crop loss).</p> <p>4.) Use of purchased inputs is low in cowpea production except for synthetic pesticides. However, synthetic fertilizer is applied for other crops such as maize.</p> <p>5.) Cowpea covers between 25-40% of planted land area. Other major crops are maize (corn), okra, and indigenous leafy vegetables (amaranthus).</p> <p>6.) According to farmers, the most destructive cowpea pests are caterpillars (i.e. larvae of <i>MARUCA VITRATA</i>) which attack cowpea flowers and pods.</p> <p>7.) Phone network coverage/signal is excellent and internet connectivity is good. Almost every farm household has a cell phone. Most cell phones are basic and may not have internet capabilities.</p>	
	<p>DAY 4 Meeting with Dr Razack Adeoti, a resident agricultural economist at the IITA station in Cotonou, Benin. I made a request for existing data on the cowpea sector in Benin, including households' socio-demographics, technical reports, market information and historical data on production levels, prices, among other relevant documents for the purposes of the cowpea precision IPM project. In addition, I met with Dr. Brice Jean Gbaguidi (socio-economiste de development Associe de Recherche) who has collaborated on many projects with Dr. Razack Adeoti, (and even share an office together).</p>	<p>DAY 4 1.) Razack agreed to share all relevant materials from his previous research and PRONAF project works. He pointed out that much of the information are scattered among project collaborators and national partners like INRAB. Razack has shared the information he has assembled so far (including farmers' willingness to pay for biopesticides), and he is working on retrieving any remaining materials which will be shared in due course.</p> <p>2.) Razack also pointed me to national institutions like ONASA (for historical data on prices) and the Agricultural Statistics Service under the Ministry of Agriculture. According to Razack, INRAB works closely with this ministry so Dr. Patrice Adegbola could assist with obtaining relevant data.</p> <p>3.) <u>From Brice's experience:</u> farmers complain about the weak efficacy of biopesticides. He has a technical report on the perception of farmers regarding the use of plant extracts as pesticides. Brice has promised to look for and share this report (Razack may also have this report). Brice also mentioned that previous projects trained farmers on 'Agro-ecosystem Analysis', where farmers were taught to use synthetic pesticides sparingly when absolutely necessary (especially during periods of high pest pressure). In other words, farmers were encouraged to use mostly biopesticides and only supplement with synthetic pesticides as 'last resort'. Furthermore, Brice indicated that market research is important to promote biological pest control strategies. Hence, consumers' willingness to pay price premiums for biopesticide-produced foods must be accounted for. On secondary data sources, Brice suggested the FAO statistics database and CARDER (extension unit in Benin).</p>	<p>DAY 4 Michael Agyekum, Elie Dannon, Razack Adeoti, Brice Jean Gbaguidi</p>

	<p>DAY 5</p> <p>1.) Meeting with Dr Patrice Adegbola, (agricultural economist and director of INRAB) to discuss access to existing data on farm households in Benin, farming systems, agricultural statistics and historical data on production levels, prices, and technology adoption practices. This appointment was facilitated by Drs Manu Tamo and Elie Dannon.</p> <p>2.) Second Skype meeting with the Economics team members at MSU and UIUC.</p>	<p>DAY 5</p> <p>1.) Patrice has agreed to assist the economics team to get access to secondary data in INRAB's database. He could also be helpful in contacting personnel at the Ministry of Agriculture. Due to his busy Patrice's busy schedule, Dr Razack Adeoti has promised to personally follow-up on my visit to Dr. Adegbola to make sure that my request is given the needed attention. Eustache Biaou could also be helpful here.</p> <p>2.) Discussions were based on accomplishments within the week and plans for the following week while in Benin. Members brainstormed and agreed to focus on the following issues bothering on sampling strategy and key characteristics to consider during the field survey and farmer choice experiments:</p> <p>A.) Sources of variation, geographic distribution of villages, farm household's access to input and product markets.</p> <p>B.) Identify existing Sampling frames and appropriate sampling procedure for the baseline study.</p> <p>C.) Key determinants of adoption plus other factors that may influence farmers' decisions during implementation of the choice experiments.</p>	<p>DAY 5</p> <p>1.) Michael Agyekum, Eustache Biaou, Elie Dannon, Manu Tamo, Patrice Adegbola.</p> <p>2.) Michael Agyekum, Cynthia Donovan, Kathy Baylis, Loredana Horezeanu,.</p>
<p>Saturday, February 7 to Sunday, February 8, 2015</p>	<p>Reviewed literature on economic impact assessments of agricultural technologies such as the introduction of Genetically Modified cowpea (i.e. Bt Cowpea). In addition, I started drafting the initial field survey design using information gathered so far.</p>	<p>Previous studies have employed economic surplus analysis by estimating annualized NPV (or aggregated) NPV as producer welfare indicators. Also, Benefi-Cost Ratios have been used. On the demand side, random utility theory has been applied to estimate consumers' stated preferences and willingness to pay. Dr. Ousmane Coulibaly has been actively involved in such impact assessment projects especially for cowpea production in the West African sub-region.</p>	<p>Michael Agyekum</p>
<p>Monday, February 9 through Friday, February 13, 2015</p>	<p>DAY 1:</p> <p>1.) Field team travelled from Cotonou (IITA Station) to the SENS Bénin office in Dassa.</p> <p>2.) The team met with Merryl and Kemi. Elie and I explained the objectives of our visit in some more details to Merryl and Kemi.</p> <p>3.) Meeting with Merryl at her office to talk about issues with regard to her organization's (SENS Bénin) social enterprise initiatives, successes and challenges. Also, contacts persons for commercial biopesticide producers and the Women's Group.</p>	<p>DAY 3:</p> <p>1.) The team set off from the IITA Station in Cotonou at 9:45 am and arrived in Dassa at approximately 3:00pm local time.</p> <p>2.) Merryl and Kemi were excited about the project and pledged full support for the IPM project, especially with biopesticide enterprises and empowerment of the Women's Group.</p> <p>3.) The Women's Group supply Neem seeds to P-HVC (a social enterprise) in Glazoué which processes Neem oil as biopesticide sold to vegetable producers in Cotonou. The seed suppliers work during off-season periods thereby generating additional income. A total of 140 women are involved in the seed supply business. Major challenges are business management, particularly finances and record keeping.</p> <p><u>Question on cell phone access and call quality:</u> According to Samuel Arakongne (colleague of Merryl at SENS Bénin), phone network coverage and call quality is good. About cell phone access, Samuel</p>	<p>DAY 3:</p> <p>1.) Michael Agyekum, Elie Dannon, an IITA Field assistant and a driver</p> <p>2.) Michael Agyekum, Elie Dannon, Merryl Parisse, Kemi.</p> <p>3.) Michael Agyekum, Elie Dannon, Merryl Parisse.</p>

	<p>4.) Final meeting for the day was with Thomas Assogba, the entrepreneur running P-HVC (the Neem-oil producing enterprise). SENS Bénin works closely with Thomas' company and the Women's Group. My interaction with Thomas sought to understand the enterprise's cost components and revenues.</p>	<p>believes access is 100% at the household level but access on per capita basis is much lower probably around 30%. Most cell phones are also basic. My own observation confirmed that phone network signals are good.</p> <p>4.) The neem oil processing facility has the following <u>cost items</u>: neem seeds as the main raw materials, machinery (seed crusher, grain sieve, oil extractor/pressor, oil filter), hired labor, electricity/energy), and product-packaging materials. <u>On the output (revenue) side</u>: the primary product is neem oil. Seed cake (remnant after oil is extracted from dried neem seeds) is a by-product sold to farmers as organic fertilizer. The initial capital for this company was provided by a philanthropist so no interest is charged. Typical interest rates on loans hover around 18%. According to Thomas, one major challenge faced in the marketing of biopesticides is poor management/record-keeping skill on the part of farmers. As a result, farmers are unable to fully observe gains made from using biopesticides. Against this backdrop, Thomas believes that training farmers on farm management practices (especially simple book-keeping) would help them understand their financial gains plus other benefits derived from using biopesticides. Currently, the company benefits from subsidies (interest-free loan) and other managerial assistance from SENS Bénin because the market for biopesticide is small. For sustainability, biopesticide prices (neem oil) may have to go up from the current price of FCFA 3,300 per litre.</p>	<p>4.) Michael Agyekum, Elie Dannon, an IITA Field assistant and a driver.</p>
	<p>DAY 2: 1.) The field team travelled to a village called Dani, near Save, to meet with a farmer. Questions asked followed previous formats, focusing on farmer's pest control strategy and attitude toward adoption of IPM methods.</p>	<p>DAY 2: 1.) Our interaction with this farmer revealed that <i>MARUCA VITRATA</i> was the most common and destructive farm pest that damages both cowpea flowers and pods. Another revelation was that some types of plant-based biopesticides cause discoloration of cowpea grains, especially the 'white-grain' cowpea varieties. Discolored cowpea grains are seen as of inferior quality, therefore, attracting lower prices. Reacting to this observation, Dr Elie Dannon indicated to me (after the interview) that Neem oil do not affect the color of grains so the farmer's experience may have been due to biopesticides prepared from leaf extracts. The other issues the farmer raised were consistent with what other farmers had pointed out in previous our earlier meetings. Apparently, most farmers who have participated in past projects are in favor of biological pest control strategies (particularly biopesticides) although they admit that home-preparation of the biopesticides is tedious making it impractical to apply on a large scale, plus biopesticides are less effective against pests. This implies that farmers still rely on synthetic pesticides for convenience (readily available and easier to apply) and the most desirable property of effectively reducing pest pressure. Finally, according to the farmer, there is high risk involved in farming in this area (only one rainy</p>	<p>DAY 2: Michael Agyekum, Elie Dannon, an IITA Field assistant and a driver.</p>

	<p>2.) The next appointment for the day was with the president of a vegetable growers association at Odo Otchere, near Dassa. The president led us to meet and speak with the Women’s Group members present (including a leader and one member of the Women’s Group who have volunteered to participate in the cottage production of this projects proposed biopesticide product). The interaction followed a Focus Group discussion format.</p>	<p>season); hence it is difficult for farmers to access credit facilities from microfinance institutions. Interest rates are prohibitive at 18%. <u>Phone access and network coverage:</u> MTN and MOOV have good coverage in this area. Also, all household have access to cell phones especially household heads and spouses.</p> <p>2.) This group discussion produced similar concerns about biopesticides in that farmers are less satisfied with the efficacy of biopesticides against field pests. According to the farmers, many rounds of biopesticide spraying are needed to achieve results comparable with synthetic pesticides. It is worth noting that farmers appeared to be aware of the potentially hazardous health impact of human exposure to chemical pesticides. Another major issue that was raised was on access to credit to encourage adoption of new technologies. <u>Phone access and network coverage:</u> Cell phone access among the women group is about 50%. MOOV and MTN have good network coverage in this area.</p>	
	<p><u>DAY 3:</u> The team travelled from Glazoue to Davihoue in the Cuoffo Department. Here, we interacted with two farmers in separate meetings:</p> <p>1.) The first farmer we met had participated in past projects where he received training from IITA researchers (under the PRONAF project) regarding biopesticide application.</p> <p>2.) The second farmer has never had any direct contact with previous projects.</p>	<p><u>DAY 3:</u></p> <p>1.) In this area, cowpea is mostly grown in the minor season from September –November. This farmer applies only biopesticides on his farms. He pointed out that if the potency of biopesticides could be improved, many farmers would be encouraged to adopt them. In addition, biopesticides must be readily available on markets in user-friendly forms to promote large-scale use among farmers. Also, the farmer emphasized the need for researchers and policy makers to educate farm households on the benefits of biopesticides. In contrast with other farmers’ opinions, this farmer asserts that there is no noticeable difference in crop yield when you compare harvests from synthetic pest control methods against those of biopesticide approaches. In the various field interactions with farmers, I observed that those who have participated in previous projects tend to exhibit some sense of loyalty to the teachings of those projects (that trained them on the use of biopesticides). Therefore, during the survey sampling stage the economics team may have to account for this possible source of bias by stratifying farm households into ‘participants’ and ‘non-participants’.</p> <p>2.) The second farmer was blunt in telling us that he uses synthetic pesticides because biopesticides are not effective against pests. He added that “if you do not apply synthetic pesticides on your farm you end up harvesting nothing” (literally translated). To this farmer, synthetic pesticides application is the best and most reliable pest control strategy available.</p>	<p><u>DAY 3:</u> Michael Agyekum, Elie Dannon, an IITA Field assistant and a driver.</p>

	<p>3.) The field visits was concluded at about 3:30 pm on this day so the team decided to travel back to Cotonou, arriving at approximately 8:00pm.</p>	<p>Interestingly, the synthetic pesticides he applies are those designated for cotton plants. This farmer appeared to be aware of the negative health impacts from synthetic pesticides but his concern was on grain storage practices and not pre-harvest pest control methods. However, he is open to biological pest control approaches provided they can be as reliable as synthetic pesticides.</p> <p><u>Phone access and network coverage:</u> MTN has the best coverage here but internet connectivity is quite slow. Cell phone access is 100% at the household level. On per head basis, cell phone access rate for women is lower.</p>	
	<p>DAY 4:</p> <p>1.) Back to Cotonou, I started wrapping up the Benin visit by meeting with Dr Razack Adeoti to talk more on his search and how we will be coordinating with Mr. Eustache Biaou and Dr. Patrice Adegbola at INRAB.</p> <p>2.) Final Skype meeting with the Economics team members at MSU and UIUC.</p>	<p>DAY 4:</p> <p>1.) Razack has promised to coordinate with colleagues at INRAB (Eustache Biaou and Patrice Adegbola) to assemble much of the information needed from them. To facilitate sharing of files, I suggested that he create a Dropbox account for that purpose.</p> <p>This meeting was to keep the economics team members up to speed with the week’s field visits to the biopesticide social enterprises and the Women’s group at Glazoue and surrounding villages. Also, the economics team discussed some of the accomplishments from this preliminary visit to Benin, namely the field trips and contacts made with IITA collaborators and national partners in identifying sources of secondary data/information that would be critical for the ex-ante economic impact assessment of the cowpea precision IPM project. The meeting concluded with discussions on available sample frames to inform an appropriate sampling strategy and the need to stratify farmers into ‘project participants’ and ‘non-participants’ during the field survey and choice experiment design and implementation.</p>	<p>DAY 4:</p> <p>1.) Michael Agyekum, Razack Adeoti.</p> <p>2.) Michael Agyekum, Cynthia Donovan, Kathy Baylis.</p>
	<p>DAY 5:</p> <p>1.) Final meeting with the Biocontrol team at the IITA station in Cotonou to conclude my two-week visit to Benin.</p>	<p>DAY 5:</p> <p>1.) In this meeting, I asked the biocontrol team about names of the multiple field release sites planned for the final stage of the biocontrol agent releases. Dr. Tamo indicated that the unconfined field releases is likely to take place in the Southern and Central zones of Benin during the minor season (September-November). The following is the distribution of the planned parasitoids release sites by Departments:</p> <p>A.) <u>Mono Cuoffo</u>; Davihoue and Cuoffo Valley. B.) <u>Oueme Valley</u>; Sedje and Dannou. C.) <u>Zou-Coulline</u>; Glazoue. D.) <u>Attacora</u>; Bassila. And E.) <u>Borgou</u>; Opara.</p> <p>According to Manu, releases will be done both in cowpea farms and in wild vegetation. Therefore, before the releases roll out, the biocontrol team will</p>	<p>DAY 5:</p> <p>1.) Michael Agyekum, Elie Dannon, and Manu Tamo.</p>

	<p>2.) Concluding tour of various insect laboratories under the Biocontrol Unit of the IITA station in Cotonou, Benin.</p>	<p>meet with farmers to explain the biocontrol intervention and the need for their collective support to promote establishment of the parasitoids population. Farmers will be ‘sensitized’ to comply with the directives by using strictly biopesticides on their farms because synthetic pesticide applications will be detrimental to the successful establishment of the biological control agents. To encourage farmers’ cooperation, the IPM project will supply biopesticides and also promise compensation packages for any yield losses suffered by farm households due to their decision to avoid chemical pesticide application even in the midst of excessive pest pressure.</p> <p>Also, the biocontrol team would want the economics team to find out whether farmers would be willing to cooperate by avoiding synthetic pesticides especially during the experimental phase (i.e. the initial stages) of the field releases.</p> <p>Finally, I asked a question about availability of field interviewers the economics team could work with during the survey implementation stage. Dr Tamo indicated that Razack, Eustache and Patrice can assist the economics team to hire the services of interviewers they have worked with in the past. In fact, most of these interviewers are workers (research assistants) with IITA and INRAB. For example, Manu mentioned Mohammed who works with Dr. Brice Jean Gbaguidi and Dr. Razack Adeoti.</p> <p>2.) Dr Elie Dannon walked me through the world of biological control agents; various life-cycle stages, types of biocontrols, and pest-host interactions under lab and field conditions. I inspected various insect pests and corresponding parasitoids. The focus of this tour was on past and present parasitoids of the cowpea pest <i>MARUCA VITRATA</i>.</p>	<p>2.) Michael Agyekum, Elie Dannon.</p>
<p>Saturday, February 14- Sunday, February 15, 2015</p>	<p>Michael Agyekum travelled back to Kumasi, Ghana.</p>	<p>Ground transportation from Cotonou, Benin to Accra, Ghana. Followed by a layover in Accra before continuing the journey (from Accra) to Kumasi, Ghana on Sunday February 15, 2015.</p>	<p>Michael Agyekum,</p>