

**SYNERGIZING FERTILIZER MICRO-DOSING AND INDIGENOUS VEGETABLE  
PRODUCTION TO ENHANCE FOOD AND ECONOMIC SECURITY OF WEST  
AFRICA FARMERS (Project # 107983)**

**International Scientific and Impact Advisory Board (ISIAB) Board  
Meeting**

**July 23-26, 2017**

**OAU, Ile-Ife, Nigeria**

Synthesis Report by ISIAB

by:

Prof. Victor Okoruwa, University of Ibadan, Nigeria

Dr. Shamie Zingore, International Plant Nutrition Institute (IPNI), Africa, Nairobi, Kenya

Dr. Victor Afari-Sefa, World Vegetable Center, West & Central Africa – Coastal and Humid  
Regions, Cotonou, Benin

Dr Monica Orisadare, Obafemi Awolowo University, Ile-Ife, Nigeria

## **DAY 1**

### **1. General overview of project progress (Prof. Adebooye)**

The progress report presentation given by the Regional Project Coordinator undoubtedly underscored the successes of the project in meeting set goals and deliverables and IDRC's acceptance of all submitted reports over the past year. The Board commended the project team for the tremendous work done, particularly, agronomy, value addition, the complementarities between the innovation platform and satellite dissemination approaches among others as well as the recognition by IDRC for selecting and naming this project a flagship project of the Center and invited the team to Ottawa to meet with Senior management of the Center and that of Global Affairs Canada (particularly the Minister of Global Affairs). ISIAB members were however of the view that some of these keys successes/events should have as well been communicated to members as and when they occurred as opposed to waiting till being surprisingly informed at the annual ISIAB meeting. This was well acknowledged by the Regional Project Coordinator. As done for previous years, an overview of the External Reviewer's comments on the fourth technical report submitted to IDRC provided useful background to the project team as well to the Board and set the tone for the day's agenda for all participants.

Responses from ISIAB members mainly focused on how the team intends to measure effectiveness and impact of the 2 complementary dissemination approaches as per also the request of IDRC. This came up as an issue from ISIAB during the last year's meeting and the team intends undertaking a survey to address this issue. There is also the issue of scaling up of seeds to reach the large number of farmer beneficiaries. Seed production systems can be sustainable with private seed company linkages.

### **2. Food science (Prof. Taiwo / Dr. Sossa)**

The value addition team is commended for the tremendous amount of work from the research through the extension interface to the development of commercial products through private sector linkages, particularly for blended vegetable-fruit juice drink production in Benin. Efforts to get the first ever standards for green products in Nigeria through the Standards Organization for Nigeria (SON) is also commended.

As the team gets to the stage of development of commercial products, there is the need for better integration of the socio-economics and communication teams to better address issues of public awareness creation and cost effectiveness analysis of the value added products developed. Based on the presentations made, there is need, for example, to consider the weight-to-price profit estimations for confectionary products developed that are intended for commercialization as part of the project deliverables. Such analysis aimed at providing the much needed evidence for adoption, scaling, while commercialization can be conducted by students under the supervision of the project socioeconomist. Other issues related to branding such as the best packaging for the vegetables can be addressed by the private sector during technology uptake. Furthermore, the food science team should consider undertaking sensory studies to determine product quality and consumer acceptance of formulated vegetable-based food products for West African markets.

### **3. Agronomy (Prof. Oyedele / Prof. Akponike)**

A joint report as opposed to separate reports for the 3 project focus countries was presented in line with ISIAB's recommendations for last year. This is a good initiative by the team. Excellent progress has been made to generate new scientific knowledge on the best practices for nutrient and water management to optimize vegetable production, while ensuring improved nutrient, water and labour use efficiency. The main project trials and specific topics addressed by students cover a wide range of issues that will make significant contributions to the development of recommendation for sustainable vegetable production intensification. It is also commendable that evaluation of nutrient responses to organic and fertilizer management not only addressed biomass production, but also the improvement of the quality of the vegetables in terms of greenness (with N applications) and shelf life (with K application).

While it is good to that the project has reached a stage where, recommendations for farmers can be made based on research findings, there is the need for site specificity as average results as presented across sites for most technologies (i.e., microdosing and water use efficiency) are not suitable for the highly variable production situations. Currently, the analysis and presentation data from fertilizer response and water management trials is generalized for sites that are characterized by high variability soil types, soil fertility and climate. In essence, research findings from multi-location trials should make it possible to develop site specific recommendations. Perhaps this has been done but was made simplistic for the purposes of power point presentation. It will also be good to see detailed statistics conducted for some of the data presented; not just averages. Disaggregation of data by site to provide the indications of variability of responses should be done to help extension systems to understand how to adapt the recommendations generated to various production situations. Ranges of yield data for soil types and sites will assist in providing flexible recommendations that can be adapted by farmers depending on their location, market access, availability of organic resources, risk averseness etc. This will also help in developing extension and training manuals for training of trainers and farmer beneficiaries regarding research and existing knowledge available for the develop technologies. For example, additional information on the soil types, with a recommendation that for instance beyond a particular threshold value, no fertilizer is required to be applied with respect to a specific agro-ecological zone (coastal savannah or semi-deciduous forest zone) in a particular country.

Current fertilizer use rates for Benin and Nigeria are far high than the optimal rate of 20-40 kg N/ha that was observed in project trials. What is the basis of the current practice and are standard recommendation available? An engagement process with stakeholders, including fertilizer dealers, extension agents and development programs supplying fertilizer is required to create awareness and generate consensus on changes in fertilizer recommendations required.

The presentation also highlighted on several postgraduate student theses completed (e.g., analysis on sulphur iron and other nutrient contents of soils) that were not necessarily core deliverables of the agronomy team but these add a lot of value and some further details would be helpful in future presentations.

The comparisons between irrigation systems was very informative in understanding effective technologies that also address the needs of women farmers. However, there is need to provide more information crop parameters such as to leaf size, plant height and other properties of the

vegetables to water use management. The use of capillary tubing for precision watering is a very innovative technology that needs to be harnessed properly for dissemination. But first the cost of this technology vis-à-vis other technologies such as hand can be watering and surface hand pump watering/irrigation has to be determined to see which of the technologies is most cost effective in terms of reduced water loss and or wastage.

There is need to pay attention to the issues of sustainability of fertilizer microdosing systems in vegetable production. Firstly, the issue of how the project intends to ensure sustainable technological dissemination and use by beneficiaries (technology end-users) needs to be better articulated. For example, what plans are in place for disseminating these technologies to farmers, because training of farmers has been initiated and the project is releasing new technologies going forward. Key questions include: (i) Are there plans to keep going back to training farmers as the project comes to an end? (ii) What are the plans for incorporating such feedback loop into the project. The question of sustainability plans for adaptation of microdosing within existing farming systems. Current trials are based on short-term evaluation, not taking into account past management practices, soil nutrient stocks and indigenous nutrient supply potential, that will change over time with new recommendations. The application of microdosing technology to vegetables (as opposed to field crops) is fairly new. Looking at current uptake levels, we need to ensure that we do not get negative balances on nutrients such as N. Application of organic manure should mainly be seen as a complementary approach to inorganic fertilizer (microdosing) and not a replacement for long-term sustainability while adhering to proper environmental stewardship principles. Provision of manure application is essential for sustainability and should be an integral part of the fertilizer recommendations generated and promoted. A simple model based on simulation of carbon and nutrient dynamics in vegetable production systems could provide an important tool for ex-ante analysis of long-term impact and environmental sustainability.

This brings in the issue of the need to strengthen the monitoring (M&E) aspects of the project in general. ISIAB had made a recommendation to the project team at the 2016 meeting and this needs to be looked into again.

#### **4. Gender studies (Dr. Aransiola and Prof. Baco)**

The application of contemporary gender approaches such as the *Harvard Analytical Framework* and the Women in Agriculture Empowerment Index (WEAI) for mainstreaming gender in the project is a good idea. Results generally show that there should be more focus on training of women as current gender research has shown that the males understand the technologies more than the women.

However, it was evident from the presentation that the Nigerian and Benin team are not necessarily analyzing the same variables nor using similar analytical approaches. It is important for studies conducted to be comparable across countries and sites and this needs to be addressed by the team for coherence. Also the way the presentation, particularly, the presentation on specific issues in Nigeria gave the impression that gender is just about women and men. We acknowledge the fact that the presenters have only conducted preliminary analysis with some data even yet to be collected in the field. It is however important to emphasize that analysis and presentation be focused on first identifying the gender groups at specific sites, including the socioeconomic characteristics of the sampled respondents and how

this influences the gender division of labour and decision making on household production and consumption decisions. Also some detailed statistics such as T-tests are required before valid cross-country comparisons can be made.

We are seeing a lot of separate work from gender. There is need to see linkages between the gender and other teams like the agronomy research work, value addition research work. Gender similar to socio-economics is a cross-cutting theme and must be integrated into the mainstream technologies being developed and promoted. It is also important that the team highlights the assumptions made and any unique observations/findings in the analysis gender so that we can give derive interesting outcomes from the gender research.

## DAY 2

### 5. Communication (Dr. Ayinde)

The communication team has promoted developed technologies via various channels targeted (e.g., jingles, in local languages, e-platform, young vegetable scientists club, distributed facts sheets and bulletins etc.) at different audiences. It would however be good if the team can make this more explicit by simplifying the presentation in a tabular form by specifying set of channels targeted at different audiences and how the effectiveness of such communication channels can be measured. The presentation should ideally also have included internal project communication. This was not the case and needs to be done for future presentations. For the proposed report on the impact assessment of the communication strategies used to IDRC, it is recommended that selected communication channels be evaluated (e.g., radio, e-platform) using for example the **marketing communication AIDA (Awareness, Interest, Desire and Action)** model proposed by the board last year. This will provide not just information to the donor but also information on awareness creation and the impact of the radio programs technology adoption (i.e., production, sales, consumption patterns, etc.).

Studies on the impact assessment can be done in the form of a rapid appraisal. This can possibly be commissioned to an external agent such as a non-project collaborating department in the participating universities or another university. The socioeconomic team can in this case assist the Consultant(s) in developing the survey instruments to speed up the process given the tight deadline.

### 6. NGOs presentation on IPs and SDPs activities

The scaling-up partners (NGOs) have been very much instrumental in scaling the technologies developed by the research institutions. This will also help address the market linkages to benefit value chain actors participating in from the platform. In addition, the actors within the value chain should be allowed to the lead in most of the contacts market expansion and other linkages that might enhance the sustainability of the various innovation platforms.

While lots of progress has been made on reaching appreciable target numbers so far, it is important for the team to again include cross-cutting themes, particularly the socioeconomics theme for enhanced tracking and documentation of progress on monitoring indicators and

impact. These include for example keeping track of your training attendance and reports, numbers attending demonstration farm teachings.

### 3. Conclusion and final Impression of ISIAB

The project team continues to make great progress through the research – extension- farmer continuum with requisite private sector linkages for technology upscaling and value added product commercialization within record timelines and is most commendable. Significant beneficiary target numbers have also been reached. Further recommendations by the Board to further improve project progress, especially as we think of an exit and sustainability strategy include:

- ✓ The need to better embed key crosscutting themes of the project, particular, socio-economics/M&E, gender mainstreaming and communication within the technology delivery and scaling efforts. To this end, there seems to be insufficient feedback loop from some of the training and technology delivery efforts back into the project implementation plans, further requiring the need for on-going involvement of the socio-economic team in R&D activities as opposed to engaging them in ad-hoc evaluation activities. Thus, re-echoing the Board's recommendation in 2016, the project M&E plan and impact assessment requires clarification in terms of indicators and how they are measured and tracked. M&E should facilitate continual exchange and feedback of information between research and scaling components of the project.
- ✓ Issues related to project sustainability need to be given closer attention, especially on the private sector/industry engagement for scaling up and commercialization of value added products beyond the project life cycle. What mechanisms for example are being put in place for a successful uptake of technologies as a project exit strategy given the project officially ends in 1 year?
- ✓ The great successes been chalked by the project is naturally calling for the need to undertake several add-on R&D activities not initially in the project proposal and work plan to provide additional evidences to the donor and stakeholder community. The team should be careful not to lose focus on such requests but always ensure that work plans and budgets are re-adjusted accordingly to accommodate what is reasonably acceptable within the scope of the project.
- ✓ The project has a working communication plan but it would be much better if this is made more succinct in terms of a snapshot summary (preferably, tabular form that specifies set of key communication channels for specific audiences (project team, farmer beneficiaries, donor, stakeholders, private sector players etc.). This will further help improve internal project communication and team building.
- ✓ The gender team needs to better coordinate activities among the 2 focus countries, similar to what is being done by the other disciplines (e.g., agronomy).