

National Policy Roundtable of the Program of Accompanying Research for Agricultural Innovation (PARI)



BENIN'S NATIONAL POLICY ROUNDTABLE REPORT

By

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Executive summary

Sixty-eight agricultural innovation stakeholders from the Benin government ministries, education, extension, and research institutions; development organisations, farmers organisations; and from the regional and international organisations (like FAO) and research institutes like the Forum for Agricultural Research in Africa (FARA), IITA, ZEF, and AGRODEP/IFPRI; gathered together in the conference hall of the National Agricultural Research Institute of Benin (INRAB), to ground-truth PARI study results, and prepare the political ground necessary for scaling of agricultural innovations, job creation and food security in Benin on February 6, 2018. GIZ/GIC – Benin’s representatives also participated to this policy dialogue. The meeting was split in five subsequent presentation and discussion sessions. Session 1 opened the meeting. Session 2 set the scene for discussion of agricultural innovation in Benin, and featured presentations from: FARA and ZEF (on overview of PARI activities and results in Benin); INRAB (on status and impact of agricultural innovations, investments and multi-stakeholder platforms in Benin); IFPRI (on Targeting investments in agricultural innovation using typology of micro-regions), and AGRODEP/IFPRI (on Benin eAtlas: A tool for prioritization of investments and policies). Session 3 and 4 addressed innovation opportunities in small ruminants value chains in Benin (by INRAB); project of Green Innovation Centres for the Agri-food value chains in Benin (by ProCIVA/GIZ); impact of climate change adaptation strategies on maize yields and income in Benin (by INRAB); employment generation along the cotton and rice value chains in Benin (by University of Parakou); and, feasibility and impacts of personalized nutrition advice in Africa - Insights from Benin (by TUM and INRAB). The fifth and last session was made of a panel discussion on “outcomes and future of PARI agenda”, among researchers from INRAB, ZEF, and FARA, farmers’ representative, and policymakers from the ministry of agriculture, livestock and fisheries of Benin.

Discussions focused on quality of research in Benin; main issues faced by farmers and researchers; contributions of research to productivity, livelihoods of value chains’ stakeholders, marketing, and food security; and the roles PARI, science, and policymakers may play in solving farmers and research problems. Participants acknowledged that many research efforts have been done, but more quality efforts are still required to respond to productivity, market prices’ volatility understanding and prediction, profitable marketing, and livelihood aspirations of agricultural stakeholders, especially farmers in Benin. In relation with food security, participants learnt that Benin Republic imports and re-exports many agricultural and livestock products to neighboring countries, but also gives high priority to the production and consumption of staple crops. It has therefore been suggested that policymakers and politicians provide researchers with investments and incentives required for the generation of quality and demand-driven data and technologies needed to respond to production challenges (climate change included), and aspirations of policymakers, politicians, and agricultural stakeholders. PARI project promised to support INRAB for the generation of data, models, and technologies that can help respond to aspirations of farmers and policymakers, and fulfil food and nutrition security goals of Benin Republic. More specifically, new priority topics for the future of PARI relate to: investment; mechanization; digitalization; vocational education and training; engagement of policymakers; and employment of the youth. In all, holistic and scientific approach to the generation and scaling of technologies, and to the improvement of productivity, marketing, incomes, and livelihoods of agricultural stakeholders; and adequate political supports have been found as keys to agricultural research, growth, and food and nutrition security.

Introduction

The programme of accompanying research for agricultural innovation (PARI) aims among other things to improving the framework conditions for innovations in its target countries, including Benin. To this end, it carries out policy related research activities and organises national policy roundtable across PARI countries to ground truth PARI research findings with national agricultural stakeholders, link up researchers with national policymakers to ensure buy-in of PARI research findings, and inform agricultural policy decisions. In 2017, PARI organised the first two national policy roundtables in Ghana (in July-August) and in Ethiopia (in October). The present report relates to the third national policy roundtable organised by PARI in Benin, on 6th February 2018.

It recalls the objectives of the policy roundtable; summarizes contents and discussions related to study results presented by PARI partners on Benin, and panel discussions.

Roundtable objectives and methodology

The National Policy Roundtable of the Program of Accompanying Research for Agricultural Innovation (PARI) in Benin addressed the following objectives:

- Present preliminary research findings of relevance to key stakeholders engaged in national agricultural innovation processes in Benin;
- Ground-truth the findings with local expertise and receive guidance on further research; and,
- Jointly identify policy implications of the research, especially scope for promising innovations that would serve agricultural development, jobs and food security.

Methodologically, the PARI policy dialogue in Benin consisted essentially of 1 day interaction among agricultural innovation stakeholders of Benin. It started with introductory speeches from representatives of key organizations participating in the meeting. The introductory speeches were followed by plenary discussion of PARI research results related to Benin, the panel discussion, and closing remarks.

Speeches and study findings presented by PARI partners during the roundtable and discussions are summarized as follow.

Summary of opening speeches



The opening remarks to the Benin policy dialogue have been made by five representatives of the key institutions involved in the organization of the meeting. They were:

- Dr. Françoise Assogba-Komlan, Secretary General of the Ministry of Agriculture, Livestock and Fisheries of Benin; representing the Honorable Minister;
- Prof. Joachim von Braun, Director of ZEF;
- Dr. Yemi Akinbamijo, Executive Director of FARA; and,
- Dr. Patrice Ygué Adegbola, Director General of INRAB.

During this opening ceremony, the panelists welcomed the participants; recalled the objectives and activities implemented by PARI, contributions from PARI partners, and the context and objectives of the policy dialogue; and wished fruitful deliberations for the meeting. More specifically, they highlighted the importance of agriculture for the development of African countries, and the important role that good quality science, innovation, and fruitful partnerships have to play for the transformation of African agriculture.

Efforts of researchers from INRAB, IFPRI, TUM, and ZEF, and the coordination and financial supports from ZEF, FARA, and the German Government have also been acknowledged by the panelists.

Summary of presentations and discussions

In total, nine study results were presented in four subsequent sessions during this policy dialogue.

Session 2 presentations and discussions: Agricultural innovation in Benin



This session was chaired by Professor Simplicite Davo Vodouhê, from the Faculty of Agronomic Sciences of the University of Abomey-Calavi (FSA/UAC), Benin, and it featured four presentations from FARA, INRAB, and AGRODEP/IFPRI. This session set the scene of the Benin national policy dialogue.

Overview of PARI activities and results in Benin (by Dr. Augustin Kouévi, from FARA)



Dr. Kouévi provided participants with an overview of PARI countries, research themes, activities, and outlooks. From his presentation, one could understand that twelve African countries and India are engaged with PARI project. Research themes addressed relate to stock-taking on innovation environment and promising innovations; analyses of innovation potentials; and improving the framework conditions for innovations. Dr. Kouévi highlighted that job creation for improved food security; focus on rural development instead of value chains; learning across countries and continents; integration of research findings; targeting innovation investments; mechanization and related skill development; digitalization in agriculture and food; and youth engagement in rural development will be parts of PARI focus for the next two years (2018 – 2019).

Status and impact of agricultural innovations, investments and multi-stakeholder platforms in Benin (by Mr. Baudelaire Kouton, from INRAB)



In this presentation, Mr. Kouton recalled that agricultural innovations took place in more than 18 agricultural value-chains in Benin between 1996 and 2016. The most important quantity of the innovations related respectively to meat, vegetables, maize, roots and tubers, and cashew nut value chains. Later on, Mr. Kouton focused on the impact of the adoption of maize and rice related innovations on adopters and non-adopters' livelihoods, and concluded that adoption of the rice and maize innovations significantly and positively influenced livelihoods of adopters.

Furthermore, Mr. Kouton indicated that participation of farmers to platforms significantly improved their productivity, their bulk selling capacity, and their income. This study also pointed out that investing in research and extension leads to positive social gains. Therefore, Mr. Kouton suggested that policymakers and financial and technical partners invest in research and extension for agricultural innovations, and for the improvement of farmers' livelihoods.

Targeting investments in agricultural innovation using typology of micro-regions (By Dr. Eduardo Maruyama from IFPRI)



To realize the typology of micro-regions, the IFPRI team uses to build on household surveys of the target countries. However, due to absence of relevant data in the context of Benin, the IFPRI team used alternative approaches that consisted of clustering available aggregate and GIS data related to: 1) biophysical conditions (land cover and rainfalls); 2) accessibility to cities/markets; 3) crop (cassava, maize, rice and yam) productions; and, 4) welfare/poverty spread. In all, Dr Maruyama and his team divided Benin country into 6 clusters:

country into 6 clusters:

- a) High agricultural potential areas with good agricultural production, a mosaic of croplands, forests, shrublands, and grasslands, and good access to markets. These areas are all located around the Oueme River in the Southern-Benin.
- b) Low priority areas are located near Cotonou. They include more urban centers; have lower poverty rates and good access to markets.
- c) Medium agricultural potential areas: They are located in the North, Centre, and South of Benin republic. They have mixed biophysical conditions, average production levels, and poorer access to markets.
- d) Good agricultural potential areas, with good rice and yam production, above average rainfall, but poor access to markets. They are located in the Northern Benin.
- e) High priority I areas: with high poverty rates, a mosaic of croplands, forests, shrublands, and grasslands, and good access to markets. They are located in the Centre and South-West of the country.
- f) High priority II areas: With high poverty rates, lower levels of rainfall, and poorer access to markets. These areas are also located in the Centre and South-West of the country.

This typology is expected to guide the choice of areas where agricultural investments are needed in Benin.

Benin eAtlas: A tool for prioritization of investments and policies (By Mohammed Ahid, from AGRODEP/IFPRI)



Mr. Mohammed Ahid from GIS group of AGRODEP/IFPRI–Dakar took participants through the eAtlas-Benin (online), and provided them with an overview of data access and use possibilities offered by the eAtlas. He stated that the eAtlas can currently provide thematic interactive web-based Geographic Information Systems (GIS) on 23 African countries. This is a decision support tool that can ease typology and prioritization of intervention areas for decision makers across Africa.

Issues discussed

- On Baudelaire's presentation:
 - o The impact of 2T/ha is it not overestimated? Why do we get only 43,000 CFA/year as profit?
 - o Why did you use 10% as discount rate? Would that not be too conservative? What is the duration of evaluation of the investment project?
 - o What exactly do you mean by effective involvement of agricultural research?
 - o Can you explain a bit how the multistakeholders' platform affects the yield? The platform is supposed to change stakeholders' practices.
 - o Your study would gain more by integrating quantitative and qualitative approaches such as to highlight diversity of products and practices generated by agricultural innovations.
 - o Since innovation adoption can cost, I wonder what your vision about the financing of agriculture is. Is it necessary to subsidy innovations?
 - o Agroecological zones of Benin should be taken into account.
 - o What are roles and responsibilities of multi-stakeholders platforms?
 - o Why did you not study competitiveness as you did for the productivity?
 - o What are differences between promising innovations and innovations developed?
 - o Did the adoption rate consider the duration of exposure to the varieties?
 - o Why does the number of multi-stakeholder platforms vary from year to year?
 - o Why have you not emphasized the size of the platforms?
 - o Are innovation impacts also measured on low adopted varieties?
 - o Can we couple varieties and measure their joint effects on farmers profits?
- On Augustin's presentation
 - o Which kind of research is accompanied by PARI: Fundamental or applied?
 - o How to also accompany fundamental research?

- It would be good to add climate change, water management, seeds and specific fertilizers management to the research perspectives of PARI 2.0.
- What are strategies to adopt to scale and sustain agricultural innovations?
-
- On Ahid's presentation (eAtlas):
 - Can someone build on his own data to generate his own maps on the eAtlas platform?
- On Eduardo's presentation
 - Can the household survey data collected from more than 700 Benin households by TUM and INRAB, be useful for the IFPRI typology?
 - Since the typology focuses on agriculture which is highly dependent on temperature, why did you not include temperature among your geographical variables?
- *General comment*
 - It would be good to organize a reflection day to define mechanism to fund agricultural research in Benin.

Sessions 3 and 4 presentations and discussions

These two sessions focused on innovation opportunities in selected value chains in Benin, and on improving nutrition security through targeted nutrition advice. They were co-chaired by Dr. David Arodokoun, Former DG of INRAB, and Dr. Nestor Ahoyo, the actual DDG of INRAB. Representatives from INRAB, ProCIVA/GIZ, University of Parakou, and Technical University of Munich (TUM), respectively shared their research findings related to – small ruminants value chains; ProCIVA and Green Innovation Centres; adaptation to climate change; employment along cotton and rice value chains; and feasibility and impacts of personalized nutrition advice in Africa.

Innovation Opportunities in Small Ruminants value chains in Benin (By Dr. Serge Mensah, from INRAB)



This study mapped the small ruminants' values chains in Benin and highlighted constraints, opportunities, and innovations in these value chains. The key stakeholders focused on were: breeders, traders, meat-sellers, and meat processors. As constraints, Dr. Mensah stressed at poor organisation, limited reproduction and feeding skills, and inadequate equipment and infrastructure along the ruminants' value chains. To overcome these issues, the stakeholders may need to be provided with relevant training, equipment, and infrastructure. However, the main solution provided to stakeholders of these value chains consist essentially of technical fact sheets proposed by livestock researchers from INRAB.

Project of Green Innovation Centres for the Agri-food value chains in Benin (ProCIVA) (by Mr. Boniface Ayenan from CIV/GIZ)



In this presentation, Mr. Ayenan recalled to the participants that the green innovation centre (GIC or Centre d'Innovations Vertes [CIV] in French) project (named ProCIVA in French) is one of the projects under the special initiative "One World No Hunger (SEWOH)" of the Federal Government of Germany. SEWOH aims at ending

malnutrition and hunger in the world. It intervenes in 24 countries from 4 continents. The GICs are established and managed by the GIZ through 12 countries in Africa, and India. *ProCIVA* is one of the five projects funded in Benin through SEWOH. It aims at improving livelihoods, employment, and food access of agri-food value chains stakeholders. *ProCIVA* links up value chain stakeholders for the scaling up/out of agri-food related innovations. In Benin, *ProCIVA* is implemented in 17 Communes (out of the 77 Communes composing Benin Republic). The agri-food value chains promoted by ProCIVA in Benin are rice, soya, and poultry. In all, this project has been scaling both systems-related and technical innovations in Benin. As achievement, ProCIVA has:

- trained/skilled about 190 trainers and extension agents;
- trained/skilled (within 6 – 9 months) and improved business management capacities and turnover (by 19% to more than 100%) of about 1600 small and medium enterprises (SME). 290 of these enterprises could create 599 permanent jobs of which 81% for the youth and 47% for the women;
- positively impacted about 32,000 smallholder farms;
- raised productivities in poultry (from 2 to 10 chicks per hen), rice (from 2.5T/ha to 3.7T/ha), and soya (from 0.8T/ha to 1.1T/ha);
- improved gross margins of rice producers (by 48%), soya producers (by 46%), and poultry farmers (by 96%);
- linked-up with 6 major farmer organisations through which green innovation services (business development, business matchmaking, technologies dissemination) are offered to smallholder farmers, and small and medium enterprises (SMEs). The farmer organisations represents green innovation centres for GIZ in Benin; and
- established strong linkage with Benin agricultural development system through GIZ; the national agriculture, food and nutrition security strategies and plans; the national agricultural advisory strategy; the Ministry of Agriculture, Livestock and Fisheries; and INRAB.

Most of the green innovation initiatives are planned to be mainstreamed in the national agriculture, food and nutrition security, and the national agricultural advisory strategies, plans, and actions.

Impact of Climate Change Adaptation Strategies on Maize Yields and Income in Benin (By Mrs Pélagie Hessavi, from INRAB)



In this presentation, Mrs Hessavi, building on rainfall, temperature, and relative humidity data in fishery areas of Benin, indicated that rainfall and relative humidity have generally decreased between the 1960s and 2013, while the temperature in the same areas has increased. More specifically, the presenter mentioned delay in rainfall starts, uneven distribution of rainfalls, early stop of rainfalls, and violent winds as demonstrations of climate change in the studied fishery areas of Benin. These changes involve low germination rate of seeds, drying and degeneration of seedlings, delay in the growing of plants, and low yields. As main adaptation strategies used by farmers, Mrs Hessavi mentioned: diversification of income-generative activities; adoption of short cycle varieties; organic soil mulching; and alley cropping. Econometric assessments revealed that adoption of mulching and short-cycle varieties positively and significantly affect yields and incomes of maize farmers. Therefore, investments in short-cycle varieties and mulching have been suggested as relevant alternatives for maize producers to adapt to climate change.

Employment generation along the cotton and rice value chains in Benin (By Dr. Boris Lokonon, University of Parakou)



Before addressing job creation along the cotton and rice value chains in Benin, Dr. Lokonon first described the stakeholders and activities composing each of the value chains. After these descriptions, he stated that most jobs along the agricultural value chains such as those of rice and cotton are informal and unstable, and hence, difficult to count. However, building on existing literature, Dr. Lokonon mentioned that about 70,000 farmers are involved in the rice value chains (of which 21% are women). Meanwhile cotton value chains would employ more than one million temporal and permanent employees.

Feasibility and impacts of personalized nutrition advice in Africa: Insights from Benin (presented by Prof. Kurt Gedrich, and Dr Paul Houssou, from TUM and INRAB)



This presentation informed the policy dialogue participants about the theory behind, the objectives, and the progress of this study in implementation in Benin and other African countries. Mainly, Prof. Gedrich defined what is meant by personalized nutrition, and presented the process towards a personalized nutrition. After this introductory presentation, Dr Houssou described the activities already carried out through the eight agroecological zones of Benin, from communes to households' selection, and from survey design and implementation to anthropometric measurements, after ethical clearances. This study is now at the step of blood samples collection and analysis.

These presentations were immediately followed by panel discussions.

Summary of panel discussion



From left to right, Mr. Vigan, Dr. Koudande, Dr. Adegbola, Prof. von Braun, Dr. Akinbamijo, and Mr. Guezodje

The panel discussion took place among six panelists:

- Mr. Lionel Guézodjè, former President of the Federation of Farmers' Organisations (FUPRO-Benin); and actual President of the FUPRO cooperative;
- Mr. Olivier Vigan, former Secretary General of the Ministry of Agriculture, Livestock, and fisheries of Benin; and actual Director General of the National Fund for Agricultural Development (FNDA);
- Dr. Patrice Adegbola, Director General of INRAB;
- Dr. Delphin Koudande, Former DG of INRAB, and Former Minister of Agriculture, Livestock and Fisheries of Benin;
- Dr. Yemi Akinbamijo, Executive Director of FARA; and,
- Prof. Joachim von Braun, Director of ZEF.

The panelists got to share with participants, their reflections on “outcomes and future of PARI agenda” under the facilitation of Dr. Oluwole Fatunbi from FARA.

Before asking questions to the panelists, Dr Fatunbi recalled the PARI goal and the food importation and exportation statistics of Benin. He reminded the panelists that PARI intends to conduct research to generate knowledge and information that will influence the direction of investments so that we can have innovations with socio-economic benefits for stakeholders in agriculture. Therefore, PARI wishes to inform policy and direction for growth in agriculture.

In summary, the facilitator asked the panelists to opine on the reasons why Benin Republic imports foods more than it exports; main issues faced by farmers and researchers; and the roles PARI, science, and policymakers can play in solving farmers and INRAB researchers’ problems. The answers of panelists stressed that Benin import foods both for its population but also for neighboring and hinterland countries. Benin essentially imports perfumed rice, milk, and poultry products in response to changes in food consumption habits of its population. In spite of importations, Benin ranks 11 out of African countries from nutritional point of view, to some extent because staple crops are highly prioritized by farmers. As issues, farmers are concerned with highly productive crops, inputs and technologies that respond to climate and other challenges they face; continuous access to profitable markets for agricultural products; and the support of policymakers for the promotion and consumption of locally produced agricultural products. Researchers from INRAB acknowledged that they lack financial resources and demand-driven approach to timely respond to the technical and technological needs of farmers. Therefore, the DG of INRAB pleaded for improved investment in agricultural research and change of research approach from supply-driven to demand-driven. PARI project is ready to support INRAB for the generation of data and models that can help farmers understand and predict the formation of market prices. These models can help decision-makers and farmers to prevent to some extent the volatility of market prices in Benin, which does not encourage for investment. However, PARI warned INRAB that long term and reliable price database will be required. This means that good science with good productivity, investment, and profitability data and models, with quality data inputs from both farmers and researchers is needed to contribute to the improvement of productivity, marketing, income and livelihoods of agricultural stakeholders in Benin. Therefore, a holistic and scientific approach to the generation and scaling of technologies, and to the improvement of productivity, marketing, incomes, and livelihoods of agricultural stakeholders is a key. Researchers are expected to deliver relevant evidences that can gain the support of policymakers and politicians towards this holistic intervention process. New priority topics for the future of PARI relate to: investment in agricultural innovation; mechanization in Africa; digitalization of agriculture; Vocational Education and Training; engagement of policymakers; and Youth employment.

Verbatim of the panel discussion

With reference to food importation and exportation statistics of Benin Republic, the facilitator stated: “when we quickly look at the agricultural data in Benin, as at December 2016, food

imports in Benin ranged to USD 2.63 billion. The export expenses of agricultural products in Benin were at USD 407 million. The total GDP was at USD 8.580 Billion, while GDP per capita was USD 873. These data suggest that we are spending 31% of our GDP on food importation. So, on top of all our sweat we use 31% to import the food we cannot produce. When you think around that, in line with other commodities that we import, you realise that we use everything we generate to buy something from outside, and we are operating in a negative balance. When I look at that in line with poverty incidence for 2006, it was 37.5%, but it has risen consistently and reached 40-41% in 2015. These statistics are not fantastic at all, suggesting that we still have opportunity to foster change, and to deliver for Benin”.

Facilitator: Dr. Adégbola, what will you consider based on your position and experience, as powerhead technological issues that we can push out to give birth to the change we desire for agriculture in Benin?

Dr. Adégbola :

I followed the statistics, mainly those related to imports and poverty incidence. With regard to massive importations, in general the yields of our crops are low, because technological innovations and inputs are poorly used by the farmers. Farmers are also discouraged by imports of agricultural products such as poultry products that highly compete with local productions. From my view, to reverse this trend, we need to improve yields. Appropriate technologies also need to be generated and adopted to this end. Secondly, we need to generate products that meet preferences and purchase power of consumers. In all, we need to invest in agricultural research to reverse the current trend.

Facilitator: What you have said now, we have been saying it for more than 15 – 20 years already. It appears that the problem is not changing, because we have been applying the same solutions. Is there anything, just one thing that we can do to bring forth change?

Dr. Adegbola:

It is true that we need to change our research approach/method. We need to move toward **back-ups**. Years back we used research and development approach to develop demand-driven and appropriate technologies. Later on we stopped. But now, we are working towards this research approach again. And this will allow us to respond to demands of agricultural platforms.

Facilitator: Dr. Delphin Koudande, you have been minister of agriculture and director general of INRAB in Benin. From your experience, how do we effectively influence policymakers to trigger knowledge informed actions with them?

Dr. Koudande:

Before answering your question, I would like to reflect a bit on the first two questions addressed to Dr. Adegbola. When looking at the development process of Benin since the 1960s, there are changes in food consumption habits/behaviors that are also at the origin of food importation trends we face today. For instance, Benin people tend nowadays to eat more rice than maize. Milk is also been highly valued from nutrition point of view in Benin. Milk is for instance considered as a landmark for appreciating nutrition through countries. Another element to consider is the population growth which has moved from 2-3 million in 1960, to 10 million today. To feed this growing population, we need highly productive resources and inputs (soils, fertilisers, seeds, etc.) in agriculture. Whatever we are doing, we need to maintain the productivity of our soils in order to be able to feed our population and reduce importations. Importations are mainly due to changes in food consumption habits. With regard to your question, policymakers want to be sensitised with concrete information related to what themselves and the population who vote for them will gain from technologies or innovations. Verbiage does not interest policymakers, they want to hear and see concrete and profitable evidence.

Facilitator: Mr Lionel Guezodje, you have been president of Benin farmers' Union. What are the crucial issues in your different farmers' platforms? What can we do in a short term to give birth to the change needed by farmers and the private sector?

Mr. Lionel Guezodje:

Farmers seek improvement of their incomes. And to this end, we need improvement of productivity and access to profitable markets. With regards to productivity, I acknowledge that researchers have been doing efforts since years. However, I think we need to improve a bit on research process by setting yield targets and timelines to researchers, and evaluating them, instead of giving them freedom as this has been the case up to now. This can consist for instance of asking researchers to manage to improve the yield of maize, from 2 Tons to 3 Tons per ha within the next 3 years. It is because we have not been fixing targets to researchers that productivities have been stagnating since 40 years. Should we also continue relying on rainfalls for the irrigation of our agriculture? I think no. Climate changes and every other changes going on nowadays require that we adapt by mastering production factors like water. This means that much remains to be done from technological points of view. With regard to the market, the problem we farmers face each year relates to the volatility of prices. There are projects and programmes that help farmers to master production costs. However, once farmers get to the markets, they are not often able to sell at profitable prices. What farmers want to understand today is what determines prices? Where are prices formed? By who? And how are the prices imposed to the farmers? These are key research questions that researchers may help us understand. For instance, last year, we sold 1kg of soya beans at 175 FCFA; but this year, the kg of soya is sold at 230 FCFA. So how can we explain this fluctuation, how to predict and work with it, etc.? Researchers need to provide stakeholders of the agricultural value chains with satisfactory explanations.

Nowadays, policymakers are playing their role by putting in place relevant policy frameworks that will help solve some of the agricultural problems. Other political reforms are needed to allow farmers to sell their products at profitable prices. But unfortunately, we cannot understand why policymakers are not yet concretizing their concerns for the improvement of farmers' livelihoods. As example, it has been 2 years now that the rice producers' association has been unsuccessfully requesting the right to supply prisons, hospitals, military camps, and schools with the rice they produce. I cannot understand that such a decision to encourage local rice producers can be taking so much time to be concretised by our policymakers. We wish that policymakers more and more listen to and support us especially with regard to marketing issues, because without profitable market, even if there is improvement of productivity, farmers will not feel motivated to produce.

Facilitator: I can see that everything turns around policymakers. Mr. Olivier, you have been General Secretary of the Ministry of Agriculture of Benin, and you have gone through the data. You are also minister at certain level. The farmers' representative said that increased productivity will lift farmers from poverty only if they can access profitable markets. He almost preached that policymakers moderate market prices so that farmers can make more money. What do you think would be the best option to resolve the issue of productivity and market?

Mr. Olivier Vigan:

I believe it is not bad to become Minister. 5 – 10 years ago, when he has not yet experienced the position of Minister, Dr. Koudande would have not spoken the way he is speaking today, and I would have supported him. However, given that I have also been Secretary of the Minister of Agriculture, I know that we do not only speak with numbers. To respond to your question, I would start asking Mr. Guezodje, what he means by profitable market. In a market context, it is common to only talk about volatility of prices. As big as it is with high level economists, Nigeria has not been able to master the sudden fluctuations of oil prices, and this affects Benin even up to agricultural domains. Farmers have no landmarks to understand and predict markets. It is even difficult for farmers to document their farming practices and to provide historical records that can help fixing prices. Also, the market we are talking about is not only the market of Dantokpa (Cotonou). We are talking of the international market where prices are continuously formed. Let me come back to the definition of policymaker. Policymakers want to keep their decision-making power as long as possible together with their supporters, and for the sake of securing the votes of the farmers who elected or will elect them. Therefore, as far as you will not guarantee this decision-making position to them, you are not good. When Dr. Koudande and I will want to contribute to policies with our technical backgrounds, some of our propositions may not meet farmers' aspirations. The President of the National Platform of Farmers' Organisations (PNOPPA) is here to witness that when we wanted to change inputs distribution practices to control crisis in cotton value chains in 2012, farmers preferred to follow politicians. Farmers

did not ask politicians to follow technical policymakers. Therefore, there is no good or bad markets, only strategies count. Each one should know the price ranges he/she can tolerate and sell accordingly.

One thing that we lack access to is fresh and reliable information. We should find way for real-time circulation of market information. Most of existing statistics are lies of field technicians that are carried on as truth to and by decision-makers. Ask for instance for statistics of maize: they are difficult to access. But when you ask for statistics of Cotton, you have them, because high level decision-makers know that cotton is directly correlated to the GDP. Therefore, they invest as much as possible so that data can be as reliable as possible. Statistics of the other crops are just guessed by field agents based on those of cotton. Dr. Koudande mentioned that investment in food importation is high, because of changes in food consumption habits. What do we import: pastas, perfumed rice, milk, and plenty other things that we cannot easily replace in a short term. Politicians know why they have been doing what they do. They have created for instance the Directorate of Applied Food and Nutrition (DANA) without providing it with necessary means for its effective functioning. I would finish with a story drawn from the book “the man of the people” which narrates that a Minister of trade prefers an imported coffee to the locally produced ones, while he used to preach for the consumption of locally produced foods. This is to conclude that effective changes have to come from top leaders. Markets are there, prices are information, and farmers should look for information by all relevant means, which is all about technology, technology and technology. Thank you.

Facilitator: Professor Joachim, it appears that PARI still has a big role to play in our research collaboration with INRAB. Looking at the eAtlas for example, what do we have on the table to make the PARI support functional for the agricultural sector in Benin? How can PARI research in Benin get in knowledge in innovation platforms, needs for investments, need for appropriate pricing strategies? How can we get these in place to help Benin?

Prof. Joachim von Braun:

Let me start by making a comment on market and price. We observed that domestic market price is not stable in Africa compared to other places in the world. Therefore, something has to change. The solution which I believe many scholars in food price would have given is that Africa needs more free trades, especially for maize and that could bring more stability to the African partners. High volatility is very bad for investment because it senses a signal for risk. Climate change and extremely bad weather will increase price volatility unless the markets are better organized with better market information systems. So my complete proposal is to collect a set of data. To analyse the effects of price volatility, we need long term prices records. Maybe in collaboration with colleagues from Benin, we can identify key forces. We cannot say anything right now. Benin has a particular problem linked to neighboring countries, which influence exchanges: It imports and exports through

neighboring countries. So, the exchange rate is a key factor. Maybe imports have to change with a temporary distortion of exchange rates. Coming back to PARI project, it would be important that we do not look at individual pieces of research. We must look at PARI as a stream of innovative research programme. And we see as an accompanying research programme associated with activities of the GIZ and others, as part of a stream. The good news is that some technical research are of very good quality. We have examples here and there. But countries where there are investments in technical research are most successful in productivity and competitiveness.

I think, we need to keep in mind that in Benin, the focus on staple crops is still very exceptional. Why is it so exceptional to increase yield and productivity in these crops? Because farmers will probably go for the high productivity staple crops and be able to go for profitable markets. If they have problem with staple crops they cannot optimize production of other crops. This is why we recommend as priority number one to improve the productivity of staple crops.

When you look at the GDP dollars, are people in Benin better off today compared to 1990s, from nutrition point of view? From nutrition point of view, when we look at the whole Africa, Benin is number 11, this is a great sample. Benin has made progress compared to the 1990s. Apparently this has been managed through policy and services, which is not bad.

One more thing, the farmers do not just produce commodities. He and she produce many products. An innovative farmer has to be at the center with his whole business rather than this value chain or the other.

Facilitator: Dr. Yemi, having listen to five different distinguished panelists at the high table, and sitting at the continental level, you carry the heavy load of ensuring that science leads to the development of agriculture, not only productivity, but change in the livelihoods of the farmers. Do you think the role of science can be underplayed in this or can it be over emphasized? How can Benin best leverage on the mega waves in the agricultural sector?

Dr. Yemi Akinbamijo:

This is a very complex situation. I have been into the agricultural sector in Africa for a while, and I should have thought that we should have put most of the problems we discuss today behind us. Unfortunately, the situation is that they are still with us until today. Let us look at the right side of the dynamics that have been creating this situation. We have to take a holistic approach to solve the productivity, marketing and other problems we face at the same time. I read in the social media this afternoon about what the billionaires export or do to become wealthy. The conclusion was that each of them looked down for opportunities, and out of ten opportunities, food was ranked number three. On this continent, at least three billions meals will be served today. But where are these foods coming from: are they all imported or locally produced?

What is also clear is that, Africa is declared as the richest in agricultural terms. When we go to the CGIAR centres, they are fifteen but four of them are in Africa. Meaning that in terms of research, we are not short of service when it comes to science. What I also learnt is that if we can look at where the points of inflection are, that can really help us improve.

My farmer friend nicely captured the causes of farmers' issues in terms of productivity and market. When you look at these two things, one of them is biology base and the other is social science base. There is a lot of emphasise on the biology side of agriculture, while the social science aspect that should help scaling out have been failing. And I wonder why? For me, it is because we have not been putting enough emphasise on the science of scaling. For instance, IITA – Ibadan is less than five hours by car from Cotonou, and they have a lot of innovations on maize, cassava, beans, etc. However, we have a big missing middle between the gate of research and the table of consumers. Outside Africa, you are likely to find orange juice in every supermarket every day in the year, because they import from Egypt, and the Middle East where rainfall is scarce, and also because of science. But here in Africa where we produce orange, orange juice availability is seasonal.

Back to your question, I will respond that science is the key issue.

Dr. Delphin Koudande:

I would like to come back to one important issue: postharvest management. After improving productivity, we need to control pest attacks on crops. After harvests, we also need to either well conserve and/or process agricultural products. A previous work with CORAF about 18 years ago, indicated that harvest loss reach 40 to 50% in Benin. This means, that there is a lot to do on harvest loss to reduce losses and improve yields.

Prof. Joachim von Braun:

PARI work is in progress. The question where are the opportunities for investment would require good geographic mapping. This question is relevant to be posed in front of policymakers. PARI project has pooled innovations by farmers, researchers, business people, and policymakers. And we realised that each of the twelve African PARI countries and India are pursuing different innovations. Lastly, the new priority topics for the future relate to: mechanization in Africa; digitalization of agriculture; Farmer Vocational Education and Training; Policymakers and Policymaking; and the Youth.

Facilitator: Dr. Adegbola, I saw your research reports and you put out four policy briefs. Is anyone reading this policy brief? Is anyone listening to you? What are you and your colleagues doing to bring existing innovations to scale?

Issues discussed on session 3 and panel discussion

- What do you think about the financing of agriculture in general, and agricultural research in particular?
- Presentations did not highlight origins of innovation ideas, the development of the innovations and their results.
- The 4th presentation related to job creation did not clearly mention the jobs created at the level of each value chain.
- Volatility of prices is a major problem for the trade of agricultural products. Laws related to the stabilization of regional prices should be applied.
- Transparency should be improved along the markets of agricultural products with the help of cellphones.
- Investment on agricultural research should be improved.
- Update and demand-driven technologies should be developed to support agricultural development in Benin.
- Why do prisons for instance not buy our local products? Because, our products are neither calibrated nor listed among price lists of the government. Farmers' organisations may struggle to make sure their products are calibrated and priced in the public price list of the government.
- Farmers should start financing research activities instead of waiting for everything from the government.
- Most products imported in Benin are re-exported towards hinterland countries. Benin products are hardly exported to those hinterland countries, because it functions as a transit country.
- On nutritional plan, Benin has improved compared to the 1990s.
- It seems to me that science is absent or obsolete vis-à-vis our development process. As example, some livestock are imported by UDOPER, and capons are not yet produced in Benin.

Answer to questions

Mr. Lionel Guézodjè:

The growing generation will be much more exigent than ours that is not much educated. This growing generation that knows how to use ICTs will require that researchers update themselves to be able to respond to their needs, otherwise, question mark.

Dr. Akinbamijo:

There are key contingences: Agenda 2063, STISA, Malabo, AARP, TAAT. However, what do these mean, and what is the future of PARI in this context? I see PARI in a customized way to the situation in the light of these political frameworks. And, I do believe that there is

a lot of space in Benin to be able to take the opportunities and advantages that agriculture represents in terms of making business out of it, and making poverty a history in our nations. There is regional implication for Benin being a transit country. The volume of import in the region reflects the extent to which existing opportunities in the region are untapped. And there again, we wonder what is the future of PARI? PARI may help us bridge this gap in our production system and our baskets. Regional integration of markets, policies, etc., has also to become a reality and built on. To close, I said something in a meeting at IITA when I was 50 years old. I said that we did not need to look too far to find solution to the many problems in African agriculture. Because, when you look at how Africa is written, you see two letters in its middle R and I which means to me that Research (for R) and Innovation (I) have to be at the center of agriculture in Africa. We forget it we will not go too far.

Prof. Joachim von Braun:

I want to quick out one of the statement of one of you who said “I came here to learn where the innovations come from, but I did not get the answer”. The big heros of innovation research like professor Schumpeter created the idea that innovation really happens if things get destroyed (creative destruction). Things need to be destroyed before we look forward to change situations. The Nobel price Schultz T. W. wrote a book “transforming traditional agriculture” and he said that accessible innovations have to be brought to farmers. However, innovation also requires money. If the country does not spend at least 1% of agricultural outputs for agricultural research projects, there will not be growth. From PARI perspective, PARI aims to share research insights from Germany, India, and across Africa. We need to share research because we need to learn from each other, we need to get access to our patterns, we need to be more open with sharing, and not reinvent the wheel. To comment on research and policy, every country needs a strategy to be informed by evidence from good research. They need a lot of models, a lot of statistics, a lot of hard work by academics. That is how President Kagame could ask for tax when he developed his agricultural strategy. So, lots of models, lots of good science, giving policymakers options, not only one recipe, are needed. The countries those were most successful in Africa to overcome food hunger and malnutrition and low agricultural growth, built bridge between ministries of agriculture, industry, economics, and health. So policy has to respond well to what good research suggests.

Mr. Olivier Vigan:

Under the supervision of the former Minister Dr. Koudande, we developed the strategic agricultural development plan of Benin, and adaptive mechanisms for funding and assuring the different farmer categories. I use to read and re-read these documents as policy document

of reference. From my view, we have the necessary policy documents. Next we need to develop plans and implement these policies and plans. The only problem I foresee is that our farmers do not know how to write down the problems they face and their projects. Therefore, they will have to refer to project designers who will not necessarily be able to accurately express/transcribe problems and aspirations of the farmers. Also, farmers will not be given the chance to present and defend their projects in front of the financiers. Sometimes, farmers' concerns seem to only relate to how to access finances for consumption instead of for business development. This means that we still have to work hard to put in place and implement efficient agricultural financing mechanisms. Researchers, farmers, and every other stakeholders are highly concerned with this agricultural financing reform going on. We want to finance the whole value chains from farming to marketing. However we need stakeholders who can anticipate market needs. Agricultural financing, yes, but not as a salvation army! I am not ready to waste the financial partners' money. We have to consider regional integration in our agricultural transformation process. And the first key production factor to consider is information. We need to collect real-time data and teach people how to use those data. I do not have a closing word. We are in front of an open notebook. We have to continue with integration and cooperation to fill this notebook.

Dr. Delphin Koudande:

I would like to emphasise the influence of changes in food consumption habits, and of the population growth on food importation, and their implications for agricultural research and practices. Back to the 1960s, no one used to talk about irrigation, as we do nowadays, because of population growth and reduction of arable land areas. About the formation of agricultural prices, the government does not play any role, except when farmers and the population are facing food security and other challenges. Prices are formed based on demands and supplies, with the fact that smarter stakeholders (traders and intermediaries) take more advantage than the other stakeholders of the value chains. I congratulate organisers, presenters, participants, panelists for their active participation to this policy dialogue. Certainly that we could have not been able to discuss everything, but at least we could open the discussions. We should continue such as to be able to contribute to the improvement of research results, policies, and livelihoods of the agricultural stakeholders.

Dr. Patrice Adegbola:

To the question related to access and use of policy briefs, I would like to mention that they are mostly accessed via INRAB's website and library, and used by researchers who need their content. These information documents are not often accessed by farmers, processors, extension agents, etc. We need to improve on information sharing with research results

users. Recently we visited a research and development organization in Israel, and we asked our colleagues if they publish their results. They responded that they do not publish for their career development, but they write and share technical fact sheets with farmers. At INRAB, we need to upgrade our scientific career with publications, however, we should first work for farmers, processors, and we should provide them with technical fact sheets. With regard to strategies to scale technologies, at INRAB, we believe that technologies will naturally be scaled around research stations and innovation platforms. However, we will need to highly use ICTs, instead of continuing with traditional extension approaches, which require many extension agents and important financial resources. As closing comments, I will emphasise the need to change our research approach from researcher or supply – driven to farmers or demand – driven. With reference to the development of Dr. Koudande, former minister of agriculture, from now onwards, we should target impacts of our research on working conditions and livelihoods of end-users, who are electoral clients of policymakers, in order to mobilise necessary political supports. INRAB is working so that all research and development sites can be able to evaluate impacts of the adoption research and development outputs on adopters. Next, we will need to collaborate with the other stakeholders, such as agro-industries, modern farms, youth, in order to improve our impacts on end-users or research products.

Dr. Nestor Ahoyo, DDG of INRAB:

The importance of investment in agricultural research is well acknowledged by everyone. However, this acknowledgement has not yet been reflected in practice as we wish. Yet, we need to thank policymakers, financial partners, and other stakeholders for all the efforts they have been doing for the financing of agricultural research in Benin. A special vote of thanks to the former Minister, Dr Koudande, who did all his best to improve the financing of agricultural research in Benin! The current Minister is also following the pathways of Dr Koudande, and we are glad with this political support. We need to follow the suggestion of the DG of INRAB by effectively changing our research approach to increasingly respond to the needs of end users.

Closing remarks

The panelists thanked organisers (INRAB, FARA, AGRODEP/IFPRI, and ZEF), participants, and policymakers for the good organisation, and the fruitful contributions of each other. More specifically, the representative of farmers expressed the availability of farmers to accompany INRAB, PARI, and policymakers in all initiative they may want to take to fruitfully transform its agriculture and livelihoods of agricultural stakeholders in Benin. INRAB has been urged to improve its working methods such as to adequately respond to the needs of research clients.

The DG of INRAB acting for the Minister of agriculture, also thanked all participants and organisers before declaring closed the Benin National Policy roundtable of PARI.

Conclusion and ways forward

Organising national policy roundtables around research findings of the programme of accompanying research for agricultural innovation (PARI) for the sake of informing agricultural innovation related policy decisions in PARI countries is one of the objectives of PARI project. This justifies the organisation of the national policy roundtable in Benin on the 6th February 2018, as reported above. This policy roundtable gathered sixty-eight agricultural innovation stakeholders from the Benin government ministries, education, extension, and research institutions; development organisations, farmers organisations; and from the regional and international organisations (like FAO) and research institutes like the Forum for Agricultural Research in Africa (FARA), IITA, ZEF, and AGRODEP/IFPRI; in the conference hall of the National Agricultural Research Institute of Benin (INRAB). It allowed the participants and organisers to ground-truth PARI study results and prepared the political ground necessary for scaling of agricultural innovations, job creation and food security in Benin. The meeting was split in five subsequent presentation and discussion sessions. Session 1 opened the meeting. Session 2 set the scene for discussion of agricultural innovation in Benin, and featured presentations from: FARA and ZEF (on overview of PARI activities and results in Benin); INRAB (on status and impact of agricultural innovations, investments and multi-stakeholder platforms in Benin); IFPRI (on Targeting investments in agricultural innovation using typology of micro-regions), and AGRODEP/IFPRI (on Benin eAtlas: A tool for prioritization of investments and policies). Session 3 and 4 addressed innovation opportunities in small ruminants value chains in Benin (by INRAB); project of Green Innovation Centres for the Agri-food value chains in Benin (by ProCIVA/GIZ); impact of climate change adaptation strategies on maize yields and income in Benin (by INRAB); employment generation along the cotton and rice value chains in Benin (by University of Parakou); and, feasibility and impacts of personalized nutrition advice in Africa - Insights from Benin (by TUM and INRAB). The fifth and last session consisted of a panel discussion on “outcomes and future of PARI agenda”, among researchers from INRAB, ZEF, and FARA, farmers’ representative, and policymakers from the ministry of agriculture, livestock and fisheries of Benin.

Discussions focused on quality of research in Benin; main issues faced by farmers and researchers; contributions of research to productivity, livelihoods of value chains’ stakeholders, marketing, and food and nutrition security; and the roles PARI, science, and policymakers may play in solving farmers and research problems. Participants acknowledged that many research efforts have been done, but

more quality efforts are still required to respond to productivity, understanding and prediction of price volatility, profitable marketing, and livelihood aspirations of agricultural stakeholders, especially farmers in Benin. In relation with food security, participants learnt that Benin Republic imports and re-exports many agricultural and livestock products to neighboring countries, but also gives high priority to the local production and consumption of staple crops. It has therefore been suggested that policymakers and politicians provide researchers with investments and incentives required for the generation of quality and demand-driven data and technologies needed to respond to production challenges (price volatility, and climate change included), and aspirations of policymakers, politicians, and agricultural stakeholders. PARI project promised to support INRAB for the generation of data, models, and technologies that can help respond to aspirations of farmers and policymakers, and fulfil food and nutrition security goals of Benin Republic. More specifically, new priority topics for the future of PARI relate to: investment in agricultural innovation; mechanization; digitalization; vocational education and training; engagement of policymakers; and employment of the youth. In all, holistic and scientific approach to the generation and scaling of technologies, and to the improvement of productivity, marketing, incomes, and livelihoods of agricultural stakeholders; and adequate political supports have been found as keys to agricultural research, growth, and food and nutrition security.

Appendixes

Roundtable Programme



National Policy Roundtable of the Program of Accompanying Research for Agricultural Innovation (PARI)



Cotonou, Benin, 6 February 2018

Roundtable objectives:

1. Present preliminary PARI research findings of relevance to key stakeholders engaged in national innovation processes.
2. Ground-truth the findings with local expertise and receive guidance on further research.
3. Jointly identify policy implications of the research, especially scope for promising innovations that would serve agricultural development, jobs and food security.

Time	Activity	Chair / Presenter
08:00 – 09:00	Registration	INRAB/FARA
Session 1: Opening		
09:00 – 10:00	Welcome Remarks by: <ul style="list-style-type: none">• Dr. Patrice Ygué Adegbola, Director of INRAB (MC)• Dr. Yemi Akinbamiyo, Director of FARA• Prof. Joachim von Braun, Director of ZEF• Hon Minister of Agriculture Benin	Dr. Patrice Ygué Adegbola, DG INRAB
10:00 – 10:30	Coffee Break & Group Photograph	
Session 2: Agricultural innovation in Benin – Setting the scene (Chair: Prof. Simplicé D. Vodouhê [FSA/UAC])		
10:30 – 10:45	Overview of PARI research and outputs related to Benin	Dr. Augustin Kouevi, FARA
10:45 – 11:00	Status and impact of agricultural innovations, investments	Mr. Kouton, INRAB

	and multi-stakeholder platforms in Benin	
11:00 – 11:15	Geographical targeting of innovation investments in Benin – A Rural Typology	Dr. Eduardo Maruyama, IFPRI
11:15 – 11:30	Benin eAtlas: A tool for prioritization of investments and policies	Dr. Abd Salam El Vilaly, AGRODEP/IFPRI
11:30 – 12:30	Discussion	
12:30 – 13:30	Lunch	
Session 3: Innovation opportunities in selected value chains in Benin (Chair: Dr. David Arodokoun, Former DG, INRAB)		
13:30 – 13:45	Innovation Opportunities in Small Ruminants value chains in Benin	Dr. Serge Mensah, INRAB
13:45 – 14:00	Value chain innovations of the Green Innovation Centre (soy, rice, ruminants)	Mr. Kay Grulich, GIC/GIZ
14:00 – 14:15	Impact of Climate Change Adaptation Strategies on Maize Yields and Income in Benin	Mrs Pelagie Hessavi, INRAB
14:15 – 14:30	Employment generation along the cotton and rice value chains in Benin	Dr. Boris Lokonon, University of Parakou,
14:30 – 15:15	Discussion	
15:15 – 15:45	Coffee Break	
Session 4: Improving nutrition security through targeted nutrition advice (Chair: Dr. Nestor Adjovi, DDG INRAB)		
15:45 – 16:00	Feasibility and impacts of personalized nutrition advice in Africa: Insights from Benin	Prof. Kurt Gedrich, TUM,
16:00 – 16:30	Discussion	
Session 5: Panel Discussion on “Reflections on Outcomes & Future PARI Agenda”		Dr. Oluwole Fatunbi, FARA
16:30 – 17:15	<p>Panelists:</p> <ul style="list-style-type: none"> • Dr. Patrice Ygué Adegbola, Director of INRAB • Dr. Yemi Akinbamiyo, Director of FARA • Prof. Joachim von Braun, Director of ZEF • Mr. Lionel Guezodjê, former President of FUPRO • Dr. Delphin Koudande, Former Minister of Agriculture Benin; • Mr. Olivier Vigan, Director of National Funds for Agricultural Development; and former Secretary General of the Ministry of Agriculture, Livestock and Fisheries of Benin. <p>Closing Remarks – DG of INRAB, representing the Hon Minister of Agriculture Benin</p>	

List of participants

Presentations (see PARI website)

Link to photographs