

INNOVATION PLATFORM FOR TECHNOLOGY ADOPTION (IPTA): MAIZE VALUE CHAIN IN BURKINA FASO

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ABSTRACT

This paper assesses the effectiveness of the innovation platform for technology adoption (IPTA) along the maize value chain in the Province of Sissili, Burkina Faso with the farmer organisation *Fédération Provinciale des Professionnels Agricoles de la Sissili* (FEPASSI) and processors at the centre. The IPTAs were established in phases around three priority entry-points: (i) farmer access to and soil fertility enhancement of hybrid Bondofa and open pollinated Barka and Wari maize varieties; (ii) commercialisation of quality seed and grain maize of these varieties; and (iii) maize and millet product development and marketing. The key achievements include the enhanced organisational and technical skills sets of FEPASSI to produce improved quality grain

from B-Grade grain maize to A-Grade grain maize within two years. Some of the success drivers of the maize value chain IPTA in Burkina Faso include: champion of change, market opportunities, technical skills strengthening FEPASSI extension agents, access to information through community radio and interestingly but not surprisingly, adult education to improve the reading and writing skills of members of FEPASSI. The *Institut de l'Environnement et de Recherches Agricoles* (INERA) facilitated interactions and relationships, while policy at local government level enabled trust and confidence building among actors. Transporters and media among others facilitated producer access to the input and output markets.

KEY WORDS: *QUALITY SEED, PRODUCT DEVELOPMENT, MARKET OPPORTUNITIES, CAPACITY STRENGTHENING*

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INTRODUCTION AND OBJECTIVES

Agriculture provides employment for the majority of people in sub-Saharan Africa, yet productivity of the sector has generally stagnated. In recent years however, the performance of the agricultural sector has started to show positive trends in a number of African countries (Wiggins and Slater, 2011).

Although the research community has developed technologies with proven ability to improve yields, too little of this potential has been captured by farmers (Giller *et al.*, 2011). It has been contended that organisational and institutional problems need redress, rather than technical capacity per se (Byerlee, 1998; Byerlee and Alex, 1998; Woodhill, 2010). The Forum for Agricultural Research in Africa (FARA) among others, has argued that the root of the problem may be the way research is currently carried out (Clark, 2002; Hall, 2005; FARA, 2006; EIARD, 2009). FARA proposes that the research sector move away from the ‘business as usual’ model of knowledge generation by scientists – knowledge transfer by extension – knowledge adoption by farmers, in favour of an Integrated Agricultural Research for Development (IAR4D) paradigm (CORAF/WECARD, 2011).

This call for change is not new. Chambers *et al.* (1989) argued that the way agricultural research and extension organised itself was a major contributor to the failure of science in improving the livelihoods of the poor, and the linear research-extension-farmer technology transfer approach

championed by the public extension service in 1960s and 1970s was no longer suited to agricultural research for development. The Comprehensive Africa Agriculture Development Programme (CAADP) and the Framework for African Agricultural Productivity (FAAP), for example, call for the robust engagement of a range of agricultural research and development stakeholders to deliver agricultural services in partnership for the benefit of the poor.

IAR4D is not a fixed method, but rather a perspective that places research as one part of a wider innovation system that is needed to see agriculture transformed in the region. IAR4D is not simply about the transfer of technical knowledge or skill from the haves to the have-nots, but a thinking that asks us to be explicit about our philosophy of how change happens. Is change linear or non-linear; predictable or non-predictable, controlled or emergent, technical or political (Woodhill, 2010)? If the change we desire is controlled and predictable, we need to develop detailed blueprints for actions and make sure they are followed; but the weight of development literature is shifting strongly away from this view (Easterly, 2006).

In this paper we assert that a coupling of technological with institutional innovation is needed to see the required transformation across the maize value chain in Burkina Faso. By analogy, the technology is the hardware and the institutions are the software (Woodhill, 2010). These must be

properly combined if the whole system is to work as expected. The means of combining the hardware and software is to form what is called an ‘innovation platform’ – a ‘learning by doing’ tool where all the relevant actors interact, build relationships and learn together, giving rise to the potential for new products, business relationships, processes, services, policy or financial instruments.

Sumberg (2005) proposed that by bringing all relevant stakeholders fully into the research process, the focus will shift from ‘research for its own sake’ to ‘research for development’ and this will mean a new way of doing business for research organisations. The actors include non-governmental organisations (NGOs), public and private sector providers of inputs and services, farmers’ organisations, transporters, processors, retailers, policy advocates and media. Partnerships between the public and private sectors are potentially very important tools in conducting pro-poor agricultural research in developing countries (Spielman and von Grebmer, 2006).

This paper reports on the establishment of an innovation platform for technology adoption (IPTA) for addressing the maize value chain in the zone of Leo, Sissili province, Burkina Faso and to suggest why, out of the 47 IPTAs along the maize and cassava value chains in seven countries in the CORAF/WECARD region of West and Central Africa, the maize value chain IPTA in Burkina Faso was the most effective.



MATERIALS, METHODS AND DATA SOURCES

The IPTAs were established through the active participation of the farmer organisation FEPPASI (*Fédération Provinciale des Professionnels Agricoles de la Sissili*), processors and entrepreneurs including Société Nationale de Gestion des Stocks de Sécurité (SONAGESS) and Association des Transformateurs du Burkina (ATCB). The *l'Association des Aviculteurs de Ouagadougou* as well as the *Association des transporteurs de la Sissili*, les Services chargés de la vulgarisation and policy-makers at local government level all played critical roles. The IPTA process was managed by the *Institut de l'Environnement et de Recherches Agricoles (INERA)*.

The maize value chain was analysed to determine the critical interventions necessary to promote quality seed and grain maize production, product development and marketing. Three priority entry-points were identified:

- farmer access to hybrid (Bondofa) and open pollinated maize varieties (OPV) Barka and Wari and the means to enhance soil fertility
- commercialisation of quality seed and grain maize of these varieties
- maize product development and marketing.

An innovation platform was created around each of the entry-points above and these were replicated across communities in Sissili and Ouagadougou. The stakeholders and their role in each of the IPTAs are shown in Table 1.

TABLE 1: ACTORS AND THEIR ROLES IN THE MAIZE VALUE CHAIN INNOVATION PLATFORM FOR TECHNOLOGY ADOPTION (IPTA) IN SISSILI, BURKINA FASO

Stakeholder	Key role	IPTA 1 Seed, fertiliser access	IPTA 2 Production of quality seed	IPTA 3 Development and marketing
IPTA co-ordinator	Managing the IPTAs and accounting for funds	INERA	INERA	INERA
Farmer organisation	Promoting seed and grain maize production by FEPPASI extension agents	FEPPASI	FEPPASI	FEPPASI representative
Agri-businesses	Contracts to supply maize to local markets and national food reserves. Developing maize and millet based products for the local market	Association Provinciale des commerçants de céréales (ATCB)	ATCB, SONAGESS; Comité interprofessionnel des filières céréales et niébé du Burkina Faso (CICB), others	ATCB, CTRAPA (Centrale de transformation des produits agricoles), Djigu Espoir, Association Femme-Enfants plus, Etablissement Sapientia, Les Distributeurs organisés dans CERFAS (La Céréalière du Faso)
Transporters	Facilitating collection and delivery of seed and grain maize and inputs and products	Association des transporteurs de la Sissili	Association des transporteurs de la Sissili	Transporteurs des Ouagadougou
Public extension	Improving the technical skills of FEPPASI extension agents. Assessing consumer preferences for maize and millet products	DIRECTION provinciale de l'Agriculture et de l'Hydraulique (DPAH)		Anthropologist/ sociologist
Research	Training of extension agents and champion farmers. Assessing nutritional changes in households	INERA	INERA	Nutritionist – Département de la technologie alimentaire (DTA)/Institut de Recherche en Sciences Appliquées et Technologies (IRSAT), INERA
Policy	Enhancing trust and confidence building among IPTA actors	Local government	Local government	Ligue des consommateurs Direction de la nutrition du Ministère de la santé



TABLE 1 CONTINUED: ACTORS AND THEIR ROLES IN THE MAIZE VALUE CHAIN INNOVATION PLATFORM FOR TECHNOLOGY ADOPTION (IPTA) IN SISSI, BURKINA FASO

Stakeholder	Key role	IPTA 1 Seed, fertiliser access	IPTA 2 Production of quality seed	IPTA 3 Development and marketing
Media	Sensitisation and information dissemination among IPTA actors. Promoting the visibility of IPTA along maize value chain	Christian Relief and Development Organisation (CREDO), Radio Évangile Développement (la RED)/ Agence d'Information du Burkina (AIB)	Christian Relief and Development Organisation (CREDO), Radio Évangile Développement (la RED)/ Agence d'Information du Burkina (AIB)	National TV, national radio Burkina, Sidwaya (national state daily journal)
Retail consumers	Feedback on perceptions and consumer behavioural changes			Mini-markets / superette

INERA provided the improved maize varieties and facilitated the experiential learning on quality seed and grain maize production through 0.5 ha demonstration plots, farmer field schools and field days. This enabled individual members of FEPPASI to access hybrid and OPV seed maize and each cultivated at least one ha of maize each. CREDO (an NGO) informed actors and rural communities about maize value chain best-bet practices through the Sissili rural radio, while the local press la RED (*Radio Évangile Développement*) and AIB (*Agence d'Information du Burkina*) provided targeted information to the population within and outside Sissili. The active engagement of policy-makers through the local government improved confidence and helped to build trust among actors.

RESULTS AND DISCUSSION

An estimated 6,250 IPTA actors (4,687 men and 1,563 women) directly benefited from the IPTA process. There were up to 20,000 indirect beneficiaries (13,335 men and 6,665 women) who were reached through demonstration plots, field days, farmer field schools, peer learning visits, broadcasting through radio in local languages and the local press. The president of FEPPASI farmers' organisation in the Province de la Sissili, Burkina Faso, Dagano Moussa Joseph, describes the process as follows:

"We used to conduct isolated small scale tests with INERA. When we adopted the maize value chain IPTA approach in 2008 through INERA facilitation however, we had more interactions and relationship building with relevant stakeholders on

the maize value chain and within 2-years, we inspired commercial production of certified seed and grain maize among farmers. We are witnessing the emergence of seed maize farmer entrepreneurs each producing Barka and Wari OPV quality seed maize of 2 tons/ha, and up to 5 tons/ha hybrid Bondofa. FEPPASI farmer households are at the level of entrepreneurship skills development in seed maize production and commercialization of grain maize, and their challenge is the governance of producer entrepreneurship" (CORAF/WECARD, 2011).

About 1,245 ha (of which 85 ha was seed maize) was cultivated over the two-year period. Average yields of 2 tons/ha quality seed maize and 3.5 tons/ha for OPV maize and 5.0 tons/ha hybrid maize, respectively, were obtained under farmer conditions. A total of 170 tons of quality seed maize and 4,357.5 tons of 'A-Grade grain maize' was produced by the farmers' organisation FEPPASI. Below are experiences recorded from participating farmers:

"I joined the IPTA to improve my skills on maize production in order to increase my yields. I used to harvest 10 bags of 50 kg grain maize per ha, which increased to over 50 bags of 50 kg grain maize per ha and now, my yields are 5–6 tons per ha".

"I cultivated 5 ha of hybrid maize Bondofa because I know I have a reliable market and will make a profit. I will therefore be able to afford hybrid seed for subsequent seasons."

"Last year, the seed certification service tested



my seed maize harvest and reported 98% germination and I was very happy and proud, and made money."

The enhanced organisational and technical skills of the farmer group FEPPASI, through their interaction and relationship building among IPTA actors, resulted in improved grain maize quality from 'B-Grade grain maize' to 'A-Grade grain maize'. For the first time, FEPPASI successfully supplied 'A-Grade maize grain' to SONAGESS and l'Association Aviculteurs de Ouagadougou, as reported by the Director General of SONAGESS:

"Enhanced technical and organizational skills of the farmer organisation (FEPPASI) through facilitated systemic interactions and relationship building among IPTA actors resulted in improved grain maize quality from 'B-Grade grain maize' to 'A-Grade grain maize', and the supply of 'A-Grade grain maize' to SONAGESS through a national competitive bidding".

Seed maize was sold at CFA400–500/kg (\$0.87–1.00/kg) while commercial grain maize was sold at CFA130/kg (\$0.28/kg). Similarly, maize and millet grit and flour product development was enhanced through baby food supplement fortification using complex vitamins and minerals or a combination of these.

A major obstacle to the functioning of the maize IPTA value chain was the perception by farmers that processors and entrepreneurs did not pay a fair price to the farmers. Representatives of the

FEPPASI maize producers and the ATCB agreed to conduct a cost-price analysis on production of one hectare of maize by FEPPASI and compare it to processing of one ton of grain maize by ATCB. They concluded that both were making profit on their investment and the slight income gains of the processor over the producer were insignificant.

"Before our engagement with the IPTA process, processors and maize farmers had mistrust and lack of confidence over grain maize price. When we engaged in the IPTA process, we agreed to conduct joint analysis of a fair profit margin for both parties based on our respective investments. Evidence showed that both parties are making profit on investments and processors are making a difference of only CFA 1.00 over and above the profit margin of the producers".

Biego Samsonna, President de ATCB.

The maize value chain IPTA in Burkina Faso demonstrated that the innovation platform is a powerful means of promoting the adoption of agricultural best-bets, as suggested by other authors (Hall *et al.*, 2001; Ekboir and Parellada, 2001; Clark, 2002; Watts *et al.*, 2003). The innovation platform provided the diverse social and economic actors an opportunity to understand each other's perceptions, competing interests, risks, access to resources and the incentives needed to enable entrepreneurship. The high level of interaction and relationships among the maize value chain actors demonstrated that social capital

is a powerful tool to catalyse institutional and technological innovation. The situation was summarised by Prof. Gnissa Konate, *Ministre de la Recherche Scientifique et de l'innovation du Burkina Faso*:

"As former Director of INERA and adviser to policy and now a substantive policymaker, I am convinced that the innovation platform facilitates better organisation of actors along value chains and the adoption of technology with great potential to contribute to wealth creation. We convinced policy to allocate funds to innovation platforms. Within 5–10 years, we could see the impact of the innovation platform in research on economic and social development of Burkina Faso. I am inspired to discuss with my colleagues in Government, the issue of organizational convergence using innovation platform to break the barriers to institutional convergence".

There were of course many obstacles to overcome, including timely disbursement of funds to the IPTAs and delays in the justification for how the money was spent. INERA was unable to adequately respond to issues on governance and business skills development of the actors. The low literacy of the primary end-user, the African farmer, remains a fundamental challenge. If the critical mass of farmers cannot read and write, agricultural development and economic growth in general will continue to be painfully slow. FEPPASI tackled this problem through complementary inter-sectoral



adult education through the *Programme d'alphabétisation sur la gestion de l'exploitation agricole (PAGEA)* and this enhanced the performance of the IPTA in terms of exchange of information and knowledge.

CORAF/WECARD facilitated a peer learning visit by IPTA focal persons from seven countries in West and Central Africa to the maize value chain IPTA in Burkina Faso. This changed the perspectives of peers in other national systems and enhanced their skills in the creation and facilitation of the IPTA. The DONATA focal person commented:

"We should institutionalise peer learning visits because this enables us to see and learn practical skills on the functioning of the IPTA on value chains including interactions and relationships among platform actors".

Of the 47 maize and cassava IPTAs in the seven countries in the CORAF/WECARD region, the Burkina Faso maize value chain IPTA was the most dynamic and interactive, despite its limited capacity to address governance and business skills development of the IPTA actors. The key success factors of the IPTA on maize value chain in Burkina Faso within a relatively short period of two years were:

- farmer (grain and seed) and processors at the centre of the IPTA;
- champion of change (president of farmer organisation FEPPASI);
- farmer access to preferred improved maize varieties through INERA;

- farmers in groups, each growing at least 1 ha hybrid and improved OPV maize varieties;
- local market opportunities to produce and sell quality seed and grain maize;
- farmer technical skills strengthening by INERA;
- involvement of the input and output agribusinesses and transporters;
- FEPPASI extension agents providing advisory service;
- robust policy engagement at local government level in the province of Sissili;
- end-user access to information through community radio;
- adult education to improve the literacy skills of members of FEPPASI.

CONCLUSIONS, RECOMMENDATIONS AND IMPLICATIONS

Maize based technology alone will not result in the level of change that is needed to impact on rural poverty in Burkina Faso. The operation of innovation platforms served to diagnose constraints, explore opportunities and investigate solutions. In the case of the maize value chain in Burkina Faso, the farmer organisation (FEPPASI), processors and entrepreneurs were the catalyst. INERA played the central role of facilitating interactions and relationships among actors, while policy at local government level enabled conditions for trust and confidence building to thrive. The interactive and print media sensitised and informed

IPTA actors and non-actors alike on the promise of the maize value chain in the rural economy. Transporters enhanced access to the input and output markets.

The maize value chain IPTA progressively evolved from access to, and production of, farmer and consumer preferred maize varieties, to market access for quality white and yellow grain and seed maize, as well as maize and millet grit and flour product development and marketing. Key achievements included the significant improvements in technical skills of FEPPASI to produce 'A-Grade quality seed and grain maize' over 'B-Grade maize' of the previous years, with average yields of 3.5– 5.0 tons/ha.

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