# MASTER'S THESIS
# In
# Engineering of Project and Public Policy

*Faculty of Economics, University of Montpellier 1*

## Topic

**Impact evaluation of an innovation platform on improvement of crop and livestock productions in four villages of Yatenga province, Northern Burkina Faso**

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# Abstract

This study is linked to Volta2 project, launched in December 2010 for 3 years. Volta2 project has used innovation platforms as its principal development tool to achieve integrated management of rainwater for crop-livestock agroecosystems in 2 West African countries (Burkina Faso and Ghana). The aim of our study is to assess the impact of structure of innovation platform members, their conduct, and the consequence on the improvement of performance of crop and livestock production in four focal villages of Yatenga province, northern Burkina Faso (Ziga, Koura Bagre, Pogoro Silmimosse and Bogoya). The study was conducted from April to September 2013 with 2 months of field surveys between mid-May and mid-July 2013 in the four villages.

This study was conducted through one approach borrowed from socio-economic theory: the model of "Structure – Conduct – Performance (SCP)". The improvement in crop and livestock production was measured by asking farmers for their perception of this improvement. For data collection, focus group discussions and individual surveys with different stakeholders were used. Data analysis was carried through SPSS software, firstly for factor analysis to identify the dominant constructs of what makes innovation platform successful. And then, for regression analysis to determine the relationships between structure of innovation platform, the conduct of its members and whether they are achieving the objectives they set themselves in terms of improvement of crop and livestock production. Qualitative data was also interpreted to complete and interpret the results obtained through the analysis of quantitative data.

Our study shows a positive impact of innovation platform, set up by Volta2 project, on IP member's practices in Yatenga province. Innovation platform have contributed to the change of mentalities and conduct of its members in their activities. Indeed, through IP, its members have benefited from different support in their activities that have contributed to their capacity development, mainly by the reinforcement of their human and social capacity. The human capacity was improved through different trainings and advice received by IP members from different facilitators of innovation platform, such as training in animal and crop production, training in access to market, training in management of rainwater for crop and livestock production, etc. The social capacity of IP members was improved through new contacts and new partners that IP members have got in their activities. Indeed, through innovation platform, IP members of one village have entered in contact with IP members of other villages. Innovation platform have contributed to closer working relationships among IP members within the same village and to villagers gaining easier access to some organisations such as micro-credit organisations, animal husbandry and phytosanitary services of agricultural ministry, etc., which can help them to improve their activities. This improvement of human and social capacity of IP members has resulted in the improvement of crop and livestock production through a better exchange of information and knowledge between different stakeholders and a better access to different support services.

Thus, our study shows a positive impact of innovation platform set up by Volta2 project for improvement of crop and livestock production in Yatenga province. These findings justify the necessity to support this kind of project in the perspective of reinforcing food security and reducing poverty in rural areas around the world.



**Keywords**: Impact Evaluation, Innovation Platform, Value Chain Analysis, Crop and Livestock Productions, Yatenga Province.

# Résumé

Cette étude entre dans le cadre du projet Volta2, lancé en Décembre 2010 pour une durée de 3 ans. Le projet volta2 utilise les plates-formes d'innovation comme principal outil de développement pour parvenir à la gestion intégrée des eaux pluviales pour les agroécosystèmes de culture-élevage dans 2 pays de l'Afrique de l'Ouest (Burkina Faso et Ghana). Le but de notre étude est d'évaluer l'impact de la structure des membres de la plate-forme d'innovation ainsi que leur mode de conduite sur l'amélioration des performances des productions végétales et animales dans quatre villages de la province du Yatenga, au Nord du Burkina Faso (Ziga, Koura Bagré, Pogoro Silmimosse et Bogoya). L'étude a été menée d'Avril à Septembre 2013 avec 2 mois d'enquêtes de terrain entre mi-Mai et mi-Juillet 2013 dans les quatre villages cibles.

L'étude s'est réalisée à travers une approche empruntée à la théorie socio-économique: le modèle "Structure - comportement – performance (SCP)". L'amélioration des productions végétales et animales a été mesurée en demandant aux agriculteurs leur perception de cette amélioration. Pour la collecte des données, différentes approches ont été adoptées dont les groupes de discussions et les enquêtes individuelles auprès des différents acteurs. L'analyse des données s'est effectuée grâce au logiciel SPSS qui a permis, d'abord, de procéder à une analyse factorielle afin d'identifier les constructions dominantes qui contribuent à la réussite de la plate-forme d'innovation. Par la suite, des analyses de régression multiples ont été effectuées pour déterminer comment les relations entre la structure et la conduite des membres de la plate-forme d'innovation permettent d'atteindre les objectifs fixés en termes d'amélioration et d'augmentation des productions végétales et animales. Les données qualitatives ont également été exploitées pour compléter et interpréter les résultats obtenus grâce aux analyses statistiques.

Notre étude montre un impact positif de la plate-forme d'innovation, mis en place par le projet Volta2, sur les pratiques de ses membres. La plateforme d'innovation a contribué au changement des mentalités et des comportements de ses membres dans leurs activités. En effet, à travers IP, ses membres ont bénéficié de différents supports dans leurs activités, lesquels supports ont contribué au renforcement de leurs capacités, notamment humaines et sociales. La capacité humaine a été améliorée grâce aux différentes formations et conseils reçus par les membres d'IP des différents animateurs de la plate-forme d'innovation, comme la formation en productions animales et végétales, la formation à l'accès aux marchés, la formation en matière de gestion des eaux de pluie pour les cultures et l'élevage, etc. La capacité sociale des membres d'IP a été améliorée grâce aux nouveaux contacts et nouveaux partenaires qu'ils ont obtenus dans leurs activités. En effet, à travers la plate-forme d'innovation, les membres d'IP d'un village sont entrés en contact avec les membres d'IP des autres villages. La plate-forme d'innovation a contribué à des relations de travail plus étroites entre ses membres au sein du même village et a permis aussi aux villageois de bénéficier d'accès facile à certaines organisations telles que les organisations de microcrédits, les services de l'élevage et de phytosanitaire du ministère de l'agriculture, etc., qui peuvent les aider à améliorer leurs activités. Cette amélioration de la capacité humaine et sociale des membres d'IP a abouti à l'amélioration des productions végétales et animales à travers un meilleur échange d'informations et de connaissances entre les différents acteurs et un meilleur accès aux différents services de soutien à l'agriculture.

Ainsi, notre étude montre un impact positif de la plate-forme d'innovation, mis en place par le projet Volta2, en termes d'amélioration des productions végétales et animales dans la province du Yatenga. Ces résultats justifient la nécessité de soutenir ce genre de projet dans la perspective de renforcer la sécurité alimentaire et réduire la pauvreté dans les zones rurales à travers le monde.



**Mots Clés**: Evaluation d'Impact, Plate-forme d'Innovation, Analyse de Chaînes de Valeurs, Productions Végétales et Animales, Province de Yatenga.

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## Abbreviations

| | |
|---|---|
| **ACIAR** | Australian Centre for International Agricultural Research |
| **AKIS/RD** | Agricultural Knowledge and Information Systems for Rural Development |
| **ANOVA** | Analysis of variance |
| **CORAF** | West and Central African Council for Agricultural Research and Development |
| **EADD** | East Africa Dairy Development |
| **FAO** | Food and Agriculture Organization |
| **FNGN** | National Federation of Naam Groups |
| **ICRISAT** | International Crops Research Institute for the Semi-Arid-Tropics |
| **ILRI** | International Livestock Research Institute |
| **IP** | Innovation Platform |
| **KMO** | Kaiser-Meyer-Olkin |
| **NIE** | New Institutional Economics |
| **OECD** | Organisation for Economic Co-operation and Development |
| **PROGEBE** | Regional Project on Sustainable Management of Endemic Ruminant Livestock in West Africa |
| **SCP** | Structure-Conduct-Performance |
| **SNV** | Netherlands Development Organization |
| **TESA** | Technical Cooperation |

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## General Introduction

African smallholder farmers continuously seek to improve their agricultural enterprise, to improve their food security and to increase their income by making more efficient use of their assets. Farmers need to intensify their production systems and adapt to continuous, often unforeseen and sudden changes in their production and marketing environments, which presupposes continuous innovation (**Nederlof *et al.*, 2011; World Bank, 2012**).

Thinking around innovation platforms is fundamentally for increased understanding of successful innovation processes. Given that agricultural innovation is complex and highly contextual in nature; experimentation and learning are required and need to be stimulated through innovation platform. Innovation platforms are equitable, dynamic spaces designed to bring heterogeneous actors together to exchange knowledge and take action to solve a common problem **(ILRI, 2012)**.

Working through such innovation platforms has become increasingly relevant to projects developing agrifood value chains in developing countries because governments and donors have finally recognized the role of the private sector and civil society in agricultural development so as to achieve food security (**World Bank, 2008**). Also, some previous study on agricultural intervention through innovation platforms have shown the potential positive role of innovation platform in terms of impact upon the livelihood outcomes of rural smallholder farmers in Africa (**Mapila *et al.* 2011; Nyikahadzoi *et al.*, 2012**). Today, national agro-industrial development policies in developing countries are encouraging the strengthening of value chain networks **(Cadilhon, 2013)**; and innovation platforms are one example of such networks.

However, despite the potential of the innovation platforms approach, the understanding of its implementation and particularly of the process of setting up its multi-stakeholder platform is still largely lacking. There is still very little research published on the impact assessment of innovation platforms; most evaluation reports use case studies to evaluate the impact of innovation platforms (**Gildemacher and Mur, 2012**). Researching the mechanisms of how these multi-stakeholder systems foster agrifood chain development and the impact pathways between different elements of these systems is thus highly topical. The interventions of the policy makers are also dysfunctional due to lack of the needed interaction with other stakeholders within the system (**Adekunle and Fatunbi, 2012**). Policy makers often act in an isolated fashion with summarized information from their advisers; this has often led to inappropriate policy interventions. Also, most of the partnerships did not sufficiently pay attention to monitoring and impact assessment of innovation platforms. Monitoring and evaluation of impact of innovation platforms requires the development of suitable, partnership-specific innovation indicators **(Cadilhon, 2013)**. Indicators can be used for diverse purposes. For example, the development and communication of agricultural innovation indicators, such as coordination, joint planning, increasing crop and livestock productions, etc., can be a powerful tool to facilitate policy dialogue and guide agricultural innovation policy.

So, agricultural research interventions, through agricultural innovation systems concepts, aim to change the way in which low income rural agrarian households in Africa interact with the market and the way in which they make decisions pertaining to the development of their agro-enterprises and the scarce resources which are at their disposal (**Mapila *et al.*, 2011**).

Our present study aims to evaluate the impact of an innovation platform project. This project, based in Yatenga province (Northern Burkina Faso), consists in improving of rainwater management to contribute to poverty reduction, improved livelihoods resilience, and increasing crop and livestock production.

The objectives aspired to in 2013 by this innovation platform in his second year of existence after having been set up by the Volta 2 project were related to natural resource management as well as agrifood marketing; namely, access to inputs, access to credit, increased crop and livestock production, improved soil and water management, information access and exchange, capacity building among value chain actors, coordination of activities among value chain actors and improved market access.

Our own objective in impact evaluation approach of this innovation platform project is to assess the impact of structure of innovation platform members, their conduct, and the consequence on improvement of performance of crop and livestock production in four focal villages of Yatenga province (Ziga, Koura Bagre, Pogoro Silmimosse and Bogoya). To attain this objective, we are going to:

i) Describe the structure of innovation platform members such as age, gender, seniority within innovation platform (IP), level of education, participation to IP meetings, type of activity within IP, etc.;

ii) Understand the mode of conduct of IP members within innovation platform, mainly through indicators of coordination and joint planning;

iii) Identify the performance of innovation platform, mainly through indicators of increasing crop and livestock productions;

iv) Determine the relationship between structure of IP members, their conduct, and the consequence on the improvement of performance of crop and livestock production.

This work will consist on two mains part. The first part deals with the literature review of innovation platforms and the theoretical and conceptual framework for impact assessment of innovation platform. The second part presents our methodological approach for impact evaluation of innovation platform, set up by the Volta2 project in Yatenga province, the main results, discussions, conclusions and recommendations.

# Part I: Innovation Platforms: Understanding, Theoretical and Conceptual Framework for Impact Assessment

This part of study presents the literature review of innovation platforms and the theoretical and conceptual framework for impact assessment. At first, we are going to present the innovation platforms through its definition, mode of process and operation and its functions. Secondly, we will present the theoretical and conceptual framework for impact evaluation of Innovation Platforms.

## *I.1. Innovation Platforms*

### I.1.1. Definition of Innovation Platforms

There are several definitions of innovation platforms mentioned in literature, all having the same scope and derived from one of the first definitions **(Freeman, 1987).** Here we are going to choose two definitions, from some authors, for summarize and explain what is mean by the term of innovation platforms.

**Tenywa *et al.* (2011)**, defines Agricultural Innovation Platform as a forum that brings together multi-stakeholders for visioning, planning and implementing or application of new ideas, practices or services which arise through interaction, creativity, insight, empowerment, with the aim of improving the existing situation or conditions around a common interest by bringing desired change. This author emphasizes the existence of multiple stakeholders that share together their knowledge around a common interest by improving an existing situation through providing of news ideas.

According to ILRI (International Livestock Research Institute), innovation platforms are "equitable, dynamic spaces designed to bring heterogeneous actors together to exchange knowledge and take action to solve a common problem". ILRI's definition takes in consideration all the elements present in the definition of **Tenywa *et al.* (2011).** However, ILRI's definition also takes in consideration the notions of space, dynamics and equitability. The notions of space mean that they are not necessarily fully-fledged organizations or groups; rather, they can simply be a mechanism or a location for the different platform members to get together. By dynamic, ILRI definition understands that the participation is voluntary; new members can join the platform; current members can decide to leave it if it no longer tackles their area of interest. Because innovation platforms are formed to take action to solve a common problem, it is also perfectly acceptable for the platform to disappear once the problem has been solved. Finally, ILRI experts put an emphasis on the desired equitability of innovation platforms. Although this might not always be the case in real life **(Cadilhon, 2013)**, the various members of the platforms (producers, input suppliers, traders, processors, consumers and other civil society groups, facilitating institutions, etc.) should have an equal footing to voice their viewpoint within the space. In this study, we are going to consider the ILRI definition of innovation platforms.

## I.1.2. Innovation Platforms Process

**Gildemacher and Mur (2012)** trough five case studies distinguish three different processes in agricultural innovation: needs and opportunities, experimentation and "bringing into routine use".

Needs and opportunities are the first points of the process of agriculture innovation which consists in identifying entry points for innovation by descriptions of needs and opportunities from multiple stakeholders, who may be farmers, private entrepreneurs, researchers or others, and they are meant to trigger the initiation of local experimentation with new practices. Indeed, by this first point of agricultural innovation process, we will be able to respond to some important questions such as: Why implement innovation platform? What are the real aims of implementation of innovation platform? This will also allow us to understand well the innovation platform and to make its evaluation according to the previous attempts.

The second point of agricultural innovation platform process is experimentation which consists to test and adapt, under real circumstances, the innovation platform project (its practical application). This point of agricultural innovation process can also be considered as a point to captures of essence of innovation system thinking, which emphasizes innovation as the outcome of interactive learning among multiple stakeholders involving both explicit and tacit knowledge from different sources, such as scientific, experiential and indigenous knowledge **(Leeuwis and van den Ban, 2004) cited by Kilelu *et al.* (2013)**.

The end point of agricultural innovation process is "bringing into routine use" which aims to see how to copy the experimentation of innovation platform in large scale. However, this point is much discussed. Indeed, if one considers that each innovation platform is specific in its own nature, copying an experimentation of innovation platform from one place to another place remains problematic. In terms of innovation platform, what has worked in one place cannot simply be 'copied' to another environment. Indeed, any environment is specific: behaviour of stakeholders, technology, capacities and aptitude of stakeholders, local practice, political environment, etc., changes from one place to another **(Gildemacher and Mur, 2012)**. So, copy of innovation from one place to another needs an adaptation, and also means taking some risks.

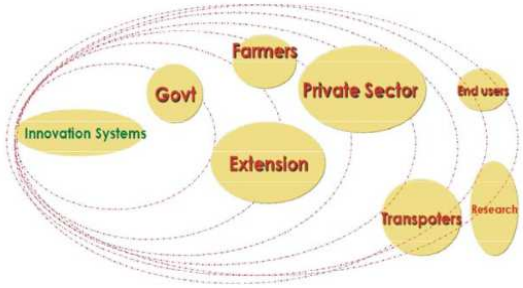
According to **CORAF (2012)**, agricultural innovation platform process can also be described in three main phases. The first phase corresponds to preparatory phase for innovation platform formation through engagement with stakeholders by seeking a common understanding of opportunities for agricultural development. The second phase concerns action planning through deepening understanding around common priorities, participatory learning and action research through multi-stakeholder action, assessment and learning from process and practice. The third phase is about adapting and re-planning by reassessing priorities, plans and activities.

**Kilelu *et al.* (2013)** consider innovation platform as co-evolutionary which mean a highly dynamic process with various interactional tensions and unexpected effects. The distributed nature of intermediation is important in resolving some of these tensions emerging at different

actor interfaces. Is why the methodology approach is focused to make the trajectory of innovation i.e. to search to show the chronological co-construction of platform since his establishment up the moment of evaluation. This methodology also attempts to understand the role of innovation intermediaries in the process including some of the tensions that may be emerged in the process. The concept of co-evolutionary also allows to understand that all stakeholder need to be involved in the innovation process which means the need of joint planning as an element of conduct.

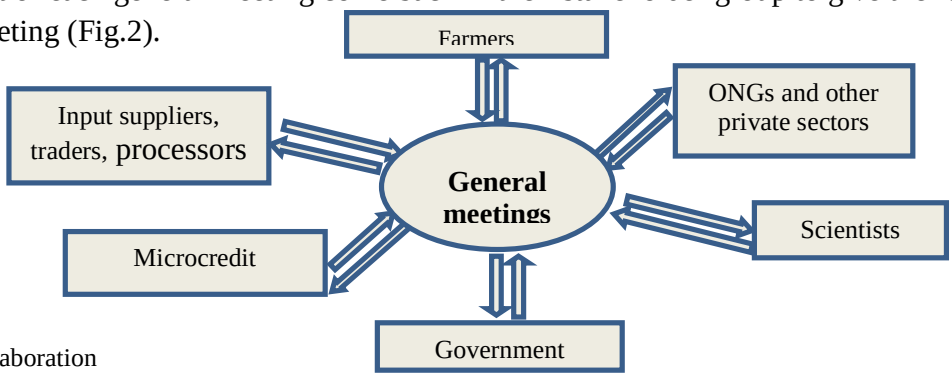
### I.1.3. Mode of Operation within Innovation Platforms

Given that agricultural innovation platform can be consider as a place for different stakeholders to find the solution to a common problem, it success mean the necessity to develop some mode of operation. According to **Adekunle and Fatunbi (2012)** a typical agricultural innovation platform should have a mix of stakeholders drawn from both the public and private sector such as scientists, extension workers, representatives of farmers, farmers' associations, private firms, non-governmental organizations and government policy makers who communicate, cooperate and interact (often across sectorial and ministerial lines) (Fig.1). And the interaction of different stakeholders within this agricultural innovation platform should be motivated by the common belief that increasing agricultural productivity can help improve the welfare of all members of society **(Eicher, 2006).**




**Source**: Adekunle and Fatunbi (2012)
**Fig.1**: Gainful interaction on an innovation platform

The main mode of interaction within agricultural innovation platforms is through different meetings that take place at two main different levels. Indeed, each stakeholder has his representatives (key stakeholders) who represent him in general meetings. Those representatives after take part of each general meeting come back in their stakeholder group to give the feedback through a meeting (Fig.2).




**Source**: Own elaboration
**Fig.2**: Example of mode of interaction between stakeholders within agricultural innovation platforms

### I.1.4. Function of Innovation Platforms

Understanding the emergence of innovation systems has recently been put at the centre of research analysing the process of technological change **(Hekkert and Negro, 2009)**, in order to understand the aims and functions of those innovation systems.

Innovation platforms can help advocate the interests of the platform members to public decision makers. This is particularly useful at the national level for industry stakeholders to provide relevant ideas and feedback into national agrifood policy making. One of the latest examples of such national innovation platform is the Tanzanian Dairy Development Forum which was launched in early 2013 to assist in dairy development policy making and to address the bottlenecks faced by industry players (**ILRI, 2013**).

Innovation platforms can also be a way to undertake collective promotion of the goods produced by the platform members, thus increasing sales to consumers and benefitting all value chain participants. An example is the East Africa Dairy Development (EADD) project which aims to transform attitudes to gender so as to achieve increased participation of women in livestock development activities. This project contributes to support decision making and innovation, expand smallholder dairy farmers' access to markets for their milk, and increase farm productivity and economies of scale.

Innovation platforms are also particularly well suited to set up food quality and safety standards in a collective manner (**FAO, 2009**).

Finally, innovation platforms can be at the centre of innovation systems to implement research and development activities in order to improve farm productivity and marketing efficiency. We have the example of PROGEBE (Regional Project on Sustainable Management of Endemic Ruminant Livestock in West Africa) which was conceived through the willingness of the participating states of the Gambia, Guinea, Mali and Senegal to promote the development of trypanotolerant livestock breeding on a sustainable basis. Innovation platforms set up by the research community rely on the active participation of platform members to suggest new research topics that will address real-life issues faced by the value chains; platform members also participate in the field-testing of new technologies and processes, and in the dissemination of successful innovations. For the researchers **(Tenywa *et al.*, 2011; Nyikahadzoi *et al.*, 2012)**, working with innovation platforms also provides a unique opportunity to tap local or traditional knowledge to be included in research protocols. At a more local level, innovation platforms can assign to some of their members the task of gathering and disseminating local market information for the benefit of all members.

According to **Hekkert and Negro (2009),** all functions of innovation platforms can be summarized in 7 functions:

- **Function of Entrepreneurial Activities**

The existence of entrepreneurs in innovation systems is of prime importance. Indeed, without entrepreneurs, innovation would not take place and the innovation system would not even exist. The role of the entrepreneur is to turn the potential of new knowledge development, networks and markets into concrete action to generate and take advantage of business opportunities. According to **Foray *et al.* (2012),** entrepreneurial actors are best placed to know or discover what they are good at producing. This typically happens through trial and error and experimentation in new activities. It therefore needs to pro-actively involve entrepreneurial actors in strategy design and offer more incentives for risk taking.

- **Function of Knowledge Development (learning)**

Mechanisms of learning are at the heart of any innovation process. Research / Development and knowledge development are prerequisites within the innovation system. This function encompasses 'learning by searching' and 'learning by doing'. **Tenywa *et al.* (2011)** show that agricultural innovation platform is an occasion for all stakeholders to learn from each order. Farmers can learn from scientist and scientist can also learn from farmers. According to these authors, the recognition and value of indigenous knowledge and capitalization on prevailing policy, institutional setting and involvement of local leadership is vital in agricultural innovation platforms.

- **Function of Knowledge Diffusion through Networks**

According to **Carlsson and Stankiewicz (1991),** the essential function of networks is the exchange of information. This function is important in a strict Research / Development setting, but especially in a heterogeneous context where Research / Development meet government, competitors, and markets. This way, a network activity can be regarded as a precondition to 'learning by interacting'. When user producer networks are concerned, it can also be regarded as 'learning by using'. **Hartwich *et al. (2007)*** show that knowledge, in fact, cannot be easily generated in research organizations, and passed down to the extension services and development projects which diffuse it among farmers. These authors show how agricultural innovation platform is a new way of managing knowledge across developing countries by focusing on new dynamics such as participation, collaboration and joint learning between farmers and other agents and thus contributing to the development and diffusion of knowledge beyond the traditional farmer-extension link.

- **Function of Guidance of the Search**

**Hekkert and Negro (2009)**, consider that guidance of the search refers to those activities within the innovation system that can positively affect the visibility and clarity of specific wants among technology users falling under this system function. An example is the announcement of the government goal to aim for a certain percentage of renewable energy in a future year. This event grants a certain degree of legitimacy to the development of sustainable energy technologies and stimulates the mobilisation of resources for this development. Innovation platforms also guide

the research insofar the contributions of different stakeholders such as local knowledge are very important to improve and go ahead in research and technology. **Makini *et al.* (2013)** evoke that innovation platforms have to strategically engage researchers for continual contribution to the development of technologies, new products, increased productivity, natural resource management, policy, markets development and gender.

- **Function of Market Formation**

It is important to create protected spaces for new technologies. One possibility is the formation of temporary niche markets for specific applications of the technology (**Schot *et al.*, 1994**). This can be done by governments but also by other agents in the innovation system. Another possibility is to create a temporary competitive advantage by favourable tax regimes or minimal consumption quotas. This is typically a government's task. One practical example of this function of innovation platform come from study of **Victor and Sridharan (2013)**, where they show how markets can contribute to the dissemination and adoption of innovations that improve livelihoods in Zimbabwe and Cambodia. Other example comes from southern Africa, where the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) was use innovation platforms to improve the production and marketing of goats. They helped lower transaction costs in the value chain, meant that farmers could make a bigger profit, and ensured that the market guides investments in goat production.

- **Function of Resource Mobilisation**

Resources, both financial and human capital, are necessary as a basic input to all the activities within the Innovation System. And specifically for biomass technologies, the abundant availability of the biomass resource itself is also an underlying factor determining the success or failure of a project. **World Bank (2012)** discusses why investments in agricultural innovation systems are becoming so important, especially investments in physical, human, and social capital.

- **Function of Creation of Legitimacy / Counteract Resistance to Change**

In order to develop well, a new technology has to become part of an incumbent regime, or has to even overthrow it. Parties with vested interests will often oppose this force of "creative destruction". In that case, advocacy coalitions can function as a catalyst to create legitimacy for the new technology and to counteract resistance to change.

Both the individual fulfilment of each system function and the interaction dynamics between them are of importance. Positive interactions between system functions could lead to reinforcing dynamics within the system, setting off positive feedback loops that lead to the diffusion of a new technology. Negative feedback loops are also possible, where a negative function fulfilment leads to reduced activities related to other system functions, thereby slowing down or even stopping the progress. **Adekunle and Fatunbi (2012)** show that a striking characteristic of an innovation platform is the enhanced interaction among the different stakeholders leading to iterative learning at the interphase of which innovation is generated and perfected.

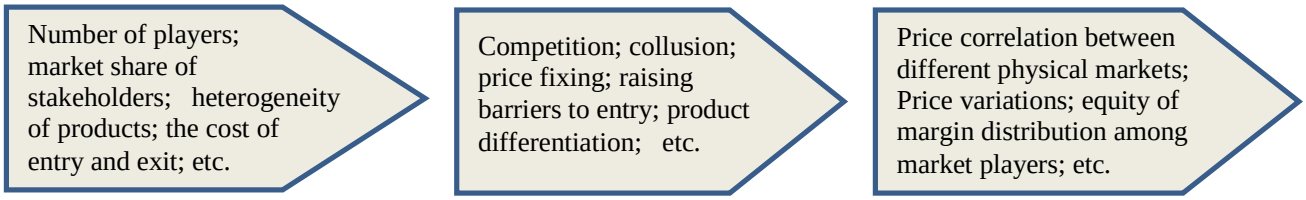
## *I.2. Theoretical Framework for Impact Evaluation of Innovation Platforms*

Different approaches can be used for impact evaluation of innovation platforms. We are going to present here, on first, the theoretical methodology approach for impact evaluation of innovation platforms based on three strands of literature of socio-economic theory: the Structure – Conduct – Performance (SCP) model, New Institutional Economics and Supply Chain Management and Marketing. Then, we will present the Characterization of business relationships in marketing research.

### I.2.1 Three Strands of Literature of Socio-Economic Theory

#### I.2.1.1. Structure - Conduct – Performance (SCP) Model

Developed by **Bain in 1959** for an industrial setting and derived from the pure and perfectly competitive market model, the structure-conduct-performance framework posited a link between the structure of a market (number of players, market share of stakeholders, heterogeneity of products, etc.), the conduct of traders (competition, collusion, price fixing, raising barriers to entry, product differentiation, cost of entry and exit, etc.) and the performance of the market measured by price indicators (price correlation between different physical markets, price variations, equity of margin distribution among market players, etc.) (**Moustier et al., 2003**). Performance in the SCP model has two meanings; the performance of individual firms and the performance of the economy as a whole. The SCP paradigm of strategy assumes market structure would determine firm conduct which would determine performance (Fig.3). The benchmark market in this type of analysis was the pure and perfectly competitive model with price indicators used to measure better performance.




**Source:** Own elaboration adapted from **Bain (1959)**
**Fig.3:** The Structure – Conduct – Performance model for pure and perfectly competitive market

#### I.2.1.2. New Institutional Economics

The new institutional economics is an attempt to incorporate a theory of institutions into economics **(North, 1991).** However in contrast to the many earlier attempts to overturn or replace neo-classical theory, the new institutional economics builds on, modifies, and extends neoclassical theory to permit it to come to grips and deal with an entire range of issues heretofore beyond its ken. The exploration of food marketing systems using new institutional economics and transaction cost economics has become prominent since the 1970s taking account of the uncertainty that is endemic in the food industry because of the technical and economic characteristics of the products, e.g., seasonality of agricultural production, instability of weather and food market conditions (**Furubotn and Richter, 2010**).

Globally, the new institutional economics aims to: i) understand what are the institutions, and why they are important to the economic growth; ii) examine how the new institutional economics differ from conventional economic theory iii) review and understand important information provided by the new institutional economics on nature and challenges of institutional reform and, at the end, iv) examine ways to make further institutional reform effective.

**The Institutions**

**North (1991)** defined institutions as the humanly devised constraints that structure political, economic and social interaction. They consist of both informal constraints (sanctions, taboos, customs, traditions, and codes of conduct), and formal rules (constitutions, laws, property rights). Throughout history, institutions have been devised by human beings to create order and reduce uncertainty in exchange. Together with the standard constraints of economics they define the choice set and therefore determine transaction and production costs and hence the profitability and feasibility of engaging in economic activity. Institutions provide the incentive structure of an economy; as that structure evolves, it shapes the direction of economic change towards growth, stagnation, or decline.

**New Institutional Economics and Conventional Economic Theory**

Based on Adam Smith's famous notion of the "invisible hand" traditional economics considered the market as simply a place where consumers and entrepreneurs met, exchanged commodities and, in the process, established prices. This conception of the traditional economic model was fully consistent with the standard neoclassical model of a capitalist economy (**Furubotn and Richter, 2010**). Indeed, neoclassical economics complete the traditional economics by assuming the existence of a large number of perfectly rational individuals, each endowed with a well defined preference ordering and a bundle of goods. In this system of neoclassic economics, individuals knew that, by exchange, they could improve their welfare. Moreover, given zero transaction costs, they would be motivated to bargain with each other until they reached a Pareto efficient exchange equilibrium. That is, they would proceed to a state of the economy in which no actor could improve his individual position without harming someone else.

In this neoclassical model of costless transactions, perfect foresight, and perfect rationality, there is no need for a specific market organization (**Furubotn and Richter, 2010**). It does not matter whether an individual trades only occasionally or professionally, whether he goes to the next street corner or sets up a whole network of trade relationships. This is the world of general equilibrium theory in which each actor trades with everybody else for whatever commodity he wishes, and for all dates to come. Its order consists of the elementary constitutional rules of private property, contractual obligations, and obligations from tortuous acts. All these rules are guaranteed by a supreme authority (the state), and constitute the legal basis for the perfect market of neoclassical microeconomics.

At contrary, New Institutional Economics (NIE) envisions a much less perfect world than the one just considered. It presupposes the existence of positive transaction costs, the absence of a

comprehensive set of futures markets, imperfect foresight, and the presence of boundedly rational economic actors. Conditions are such that specific markets and their characteristics are of definite interest. Some of the markets are formally established and organized like the London Stock Exchange, eBay, weekly town markets, and annual fairs. Others are informally or semi-formally established and set up by intermediaries or by producers.

In general, new institutional economics define 3 types of institutional arrangements of market. The spot markets forms, where there are no customer relationships and identities. The hierarchies market also called firms or vertical integration, where the transactions take place under the same administrative system. The hybrids or intermediate forms of institutional arrangement of market, whose attributes lie in between those of markets and hierarchies, traders have freedom of action and some level of control from contracting partners.

In summary, New Institutional Economics deserve the attribute institutional for its accomplishment to powerfully show the importance of institutions for any kind of collective action (**Zimbouer, 2001**). Moreover in combination with rational choice it has directed the attention to a broader encompassing concept of institutions beyond formal regulation.

### I.2.1.3. Supply Chain Management and Marketing

Quality is a major competitive priority of manufacturing firms worldwide. The processing firms need to apply quality management systems to reduce and manage quality uncertainty **(Han *et al.*, 2011**). The relational exchange perspective also illustrates the impact of long-term relationships and interpersonal trust on quality management. Moreover, nowadays, due to the opportunistic behavior of some actors (melamine-tainted milk, horse meat sold as beef, etc.), there is a need to appeal quality management system to maintain product quality and maintain consumer confidence.

## I.2.2. Characterization of Business Relationships in Marketing Research

Marketing and business management research has been traditionally more focused on identifying the various hybrids forms of institutional arrangements of market, and, in line with transaction cost economics, has put the distribution of information along the chains at the core of its analyses **(Cadilhon, 2013).** Thereby, **Webster (1992)** quoted by **Cadilhon *et al.* (2009),** defined a marketing continuum taking account of the intermediate forms of inter-firm relationship arrangements. **Noble *et al.* (2002)** have characterized how a marketing orientation pushes firms to be customer-focused throughout their activities, implementing market analysis techniques to discover the needs of customers, co-operating to react to the results of the market analysis and embedding the marketing concept in all departments of the firm. In this sense, innovation platforms participate in the distribution of information along chain stakeholders. They help in placing the market as an important decision-making factor of their members and contribute to regulate some of the marketing relationships along the chain. It is thus relevant to use some insights from the marketing literature to analyse how innovation platforms are working **(Cadilhon, 2013).**

A literature review by **Cadilhon (2005)** has concluded that the field of relationship marketing had usually been more attached to researching the hybrid forms of market organization than studies using a purely new institutional economics framework, which were more focused on the polar spot market and firm integration. The business management marketing literature provides a range of indicators for the conduct of transaction partners and the performance of their marketing arrangements **(Cadilhon, 2013)**. If many of these indicators were originally tested in industrial contexts of OECD (Organisation for Economic Co-operation and Development) countries, they have increasingly been validated through empirical research using agrifood value chains of developing countries **(Han *et al.*, 2011)**.

### I.2.3. Elements Characterizing Stakeholder Conduct within Innovation Platforms

The marketing literature has been developing constructs to characterize the way businesses undertake transactions along dyadic relationships involving suppliers and customers **(Cadilhon, 2013)**. Stakeholder conduct within innovation platforms can be characterized through information sharing, communication, cooperation - coordination - joint planning, and trust.

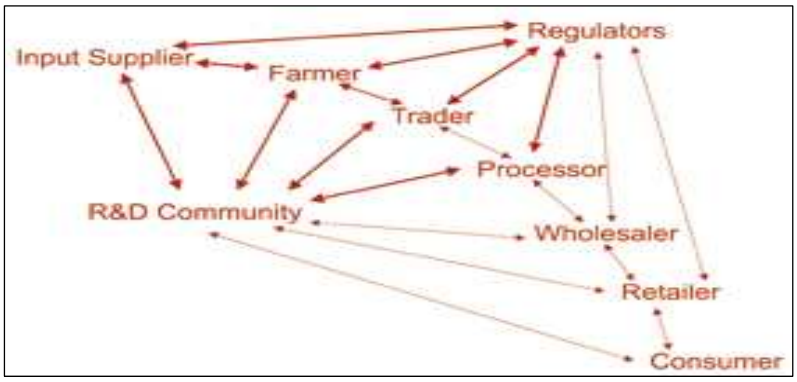
#### I.2.3.1. Information Sharing

Agricultural innovation platforms can be considered as a place of sharing information, identification of challenges and opportunities and agreement on joint activities related to a shared interest (**ACIAR, 2013).** The Agricultural Innovation Platform has been found to be an appropriate mechanism for social learning and also stimulating uptake of agricultural innovations in an atmosphere where each actor plays their appropriate role. Rather than keeping information to themselves, market-oriented firms in successful partnerships exchange information so as to better customize their activities to those of their partners and to the needs of the final consumer. When information can be codified and communicated easily, it becomes possible to supply customized products without complex interactions **(Humphrey, 2006).** Information sharing can help to increase performance according to several studies of agrifood produce marketing in developing countries where sharing information along a value chain is generally limited. For example, **FAO (2005)** considers that Agricultural Knowledge and Information Systems for Rural Development (AKIS/RD) is the entire complex of agencies and institutions that provide rural people with the knowledge and information necessary for promoting innovation in their diversified livelihoods. Also exchange of information can contribute more to food traceability by helping food-business operators to be able to supply information about where the product was sourced from and where it was sold; thus, problems can be detected in the food chain (**Humphrey, 2006).**

#### I.2.3.2. Communication

With its roots in innovation systems theory, the Innovation Platform is the real world implementation of new concepts including the valorisation of local knowledge. Innovation platform system facilitates dialogue between the main local players in the value chain: farmers,

input suppliers, traders, transporters, processors, wholesalers, retailers, regulators, and the research and development fraternity (Fig.4).




**Source: Rooyen and Homann (2010)**
**Fig.4:** Increased communication between the main role players in the Innovation Platform is indicated by bold arrows. Traditionally, communication was between the R&D community and farmers only

Indeed, despite the advent of modern information and communication technologies, face-to-face discussions and physical visits to business partners have been recognized as success factors in building stable inter-firm relationships **(Dyer and Ouchi, 1993).** Physical interactions are important as they allow the building of strong inter-personal relationships between business stakeholders who can relate to each other rather than to only a name or a business title **(Cadilhon, 2013).** Effective and frequent communication, including physical visits, was shown to have a direct positive impact on relationship benefits such as profits and waste reduction in Vietnamese fresh produce supply chains **(Cadilhon and Fearne, 2005).**

### I.2.3.3. Cooperation, Coordination and Joint planning

Cooperation has been defined as 'similar or complementary coordinated actions taken by firms in interdependent relationships to achieve mutual outcomes or singular outcomes with expected reciprocation over time' **(Anderson and Narus, 1984).** The fundamental idea of relational contracting theory is that an "integration into a relation" takes place between the exchange parties, hence price is replaced by social norms of long-term cooperation and non-opportunistic behaviour (**Rokkan, 1995)**. Four domains of potential cooperation between industrial buyers and suppliers can be identified: flexibility, information exchange, shared problem solving, and restraint in the use of power **(Heider and Miner, 1992).** As an example of cooperation, we have the TESA (Technical Cooperation) at Jærenis (Norway) based on use of a common knowledge base, the same raw materials, and generally base their interaction on social values and collective visions that foster trust and reciprocity (**Asheim and Isaksen, 2002).**

Joint planning is part of cooperation and specifically addresses the actions decided by both firms together **(Claro *et al.*, 2003). FAO (2005)** assumes joint planning among Agricultural Knowledge and Information Systems for Rural Development (AKIS/RD) agencies and organizations and is broadly concerned with fostering practical knowledge in an agriculturally organized rural learning society, with a view to developing a rural knowledge society.

Coordination mechanisms are viewed as arrangements between economic entities that govern how they cooperate to develop an innovation project **(Grandori and Soda, 1995)** cited by **(Gardet and Mothe, 2011).** And a dynamic coordination is how firms manage their business activities over time as conditions change. This definition focuses on interactions on a strategic level rather than on an operational level (such as the distribution of tasks or communication means). According to **Gardet and Mothe (2011)**, it is important to investigate on coordination mechanisms in innovation networks, because firms must interact with others and manage these relationships to develop innovation projects. Organizational arrangements, being voluntary chains, are in their very nature instruments for overcoming some kind of collective action problem that exists due to specialization and hence a need for coordination **Rokkan (1995).**

### I.2.3.4. Trust

Trust between the partners involved in the transaction is one important element of rationalism (**Rokkan, 1995)**. The concept is discussed by several writers and can be described as follows: "Trusting a person means believing that when offered the chance, he or she is not likely to behave in a way that is damaging to us, and trust will typically be relevant when at least one party is free to disappoint the other, free enough to avoid a risky relationship, and constrained enough to consider the relationship an attractive option" **(Gambetta, 2000).**

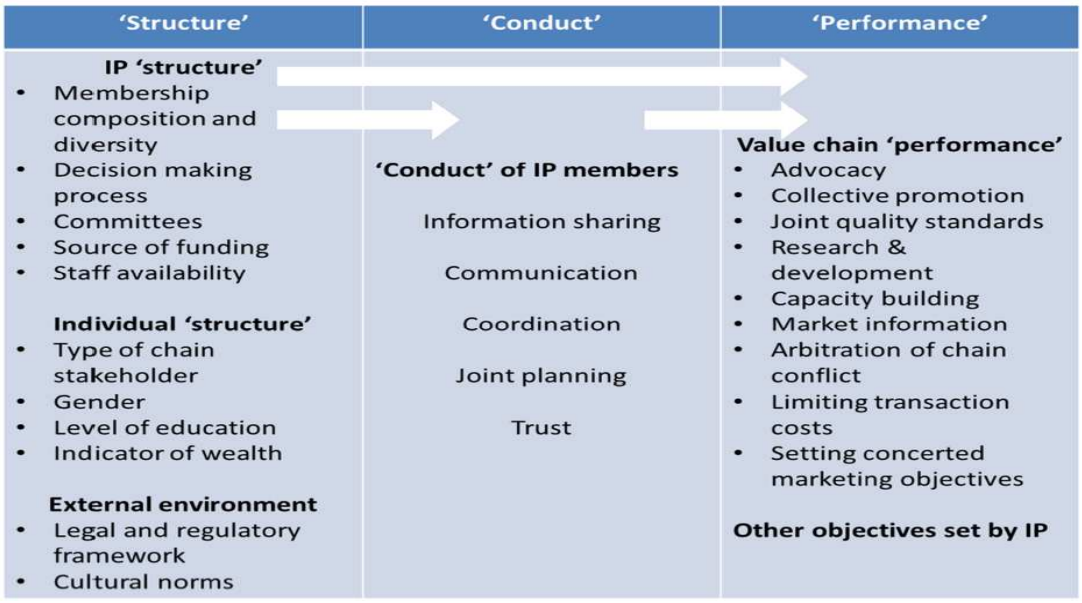
Many definitions of trust within a supplier-customer dyad can be found in the marketing literature. **Kumar (1996)** proposed that trust was the belief that each party was interested in the other's welfare and that neither would act without first considering the impact of his or her action on the other. Publications in empirical marketing have confirmed the theory on the differentiation of trust into different types of trust **(Cadilhon, 2013)**. The concept of generalized trust, norms and conventions by which all individuals are bound has been shown to be prevalent in some societies and nations **(Platteau, 1994),** where trust can even become a prerequisite to economic exchange **(Batt, 2003). Morgan and Hunt (1994)** posit that "presence of relationship commitment and trust is central to successful relationship marketing, not power." In Africa, credit institutions often develop at the local level based on trust **(FAO, 2005)**. In Cameroon, for example, there are traditional savings and credit structures at the local level in different regions of the country. These institutions, known as "*Tontine*" in the local language of Northwest Province, are based on mutual trust.

## I.3. Conceptual Framework for Impact Evaluation of Agricultural Innovation Platforms

According to (**Gildemacher and Mur, 2012), t**here is still very little research published on the impact assessment of innovation platforms; most evaluation reports use case studies to evaluate the impact of innovation platforms. We are going to present and discuss here two conceptual frameworks proposed for impact evaluation of agricultural innovation platforms.

According to **Cadilhon (2013)** the conceptual framework for impact evaluation of innovation platforms can be based on socioeconomic model of Structure- Conduct-Performance. This model

(Fig.5) positing that the structure of innovation platforms will have an impact on the conduct or behaviour of its members, which in turn will influence the performance of the platform in attaining the development outcomes it has set itself to reach. And the platform's structure may also have a direct impact on its performance.




**Source: Cadilhon (2013)**

**Fig. 5:** Elements of a conceptual framework to monitor and evaluate the impact of innovation platforms on value chains development

The methodological research proposed by **Cadilhon (2013)** conceptual framework consists to use the data collected through focus group discussions and individual surveys with platform stakeholders. Especially, the Likert-scale individual rankings of statements characterizing conduct and performance, and the structural indicators collected from platform facilitators and individual members. The data can be analysed with a series of multiple regressions in order to identify the statistically significant relationships existing between the different elements of the model. Triangulation of quantitative and qualitative data collected will help produce a richer and more robust interpretation of the results from the data analysis.

**Gildemacher and Mur (2012)** propose the impact pathway evaluation as a suitable conceptual framework to assess change in complex processes such as agricultural innovation platforms. These authors were used this approach for impact assessment of five different case of agricultural innovation platforms in sub Saharan Africa. Impact pathways are a practical description of the more abstract theory of change. They help to describe the intended and unintended results, to reconstruct in retrospect how change has come about, and to identify critical events. Its show how interventions have been realised and have contributed or not to certain results and to current and potential future impacts on people's lives. The methodological research proposed by **Gildemacher and Mur (2012)** conceptual framework consists to the collection of both quantitative and qualitative data trough focus group discussions and

individuals surveys. The surveys aimed to quantify the changes identified through the impact pathway exercise. These surveys are also conducted among control groups. Focus group discussions concerns the processes through which change and innovation occurred. Beside these quantitative and qualitative data collection, cost benefit analysis was done through estimation of costs of intervention activities and related to the current and future impact estimates.

These two different approaches for impact assessment of agricultural innovation platforms are all relevant. Also, both these conceptual frameworks combine both qualitative and quantitative data to assess to the impact of agricultural innovation platforms. The approach proposed by **Gildemacher and Mur (2012)** is very interesting in this sense that this approach combines different technique to achieve the impact assessment of agricultural innovation platforms such as use of control group and cost benefit analysis. However, **Cadilhon (2013)** approach is more formalised and transmissible than approach proposed by **Gildemacher and Mur (2012)**. Moreover, the approach proposed by **Cadilhon (2013)** is supported on socioeconomic model of structure - conduct - performance which is used in organisational economy with a great success. We will use the approach of **Cadilhon (2013)** for the impact assessment of agricultural innovation platform in northern Burkina Faso.

## I.4. Partial Conclusion

This part of study has contributed, firstly, to the understanding of innovation platforms through its definitions, mode of process and operation and functions. Secondly, it allowed us to understand the Theoretical framework for impact assessment of innovation platforms through three strands of literature of socio-economic theory: 1) the Structure – Conduct – Performance model, 2) New Institutional Economics and 3) Supply Chain Management and marketing. Furthermore, this bibliographic review helps to understand market arrangement and organisation both in traditional economic, neoclassical economic and new institutional economics. Through this first part of study, we have also capitalized the knowledge on business relationships in marketing research and on the elements characterizing stakeholder conduct within innovation platforms. Finally, this first part was contributed for the appropriation of some conceptual frameworks for impact assessment of agricultural innovation platforms. All these knowledges and approachs learned through this first part of study will be capitalized for the impact assessment of innovation platform set up by the Volta2 project in Yatenga province, northern Burkina Faso.

# Part II. Methodological Approach for Impact Evaluation of an Innovation Platform on Improvement of crop and livestock production in four villages of Yatenga province, Northern Burkina Faso

This second part of study aims, at first, to present the methodology approach for impact assessment of innovation platform on four villages of Yatenga province, in the Nord Region of Burkina Faso. Secondly, it consists to present the results of study, then the discussions and recommendations.

## *II.1. Approach for Impact Assessment of Innovation platform in Yatenga*

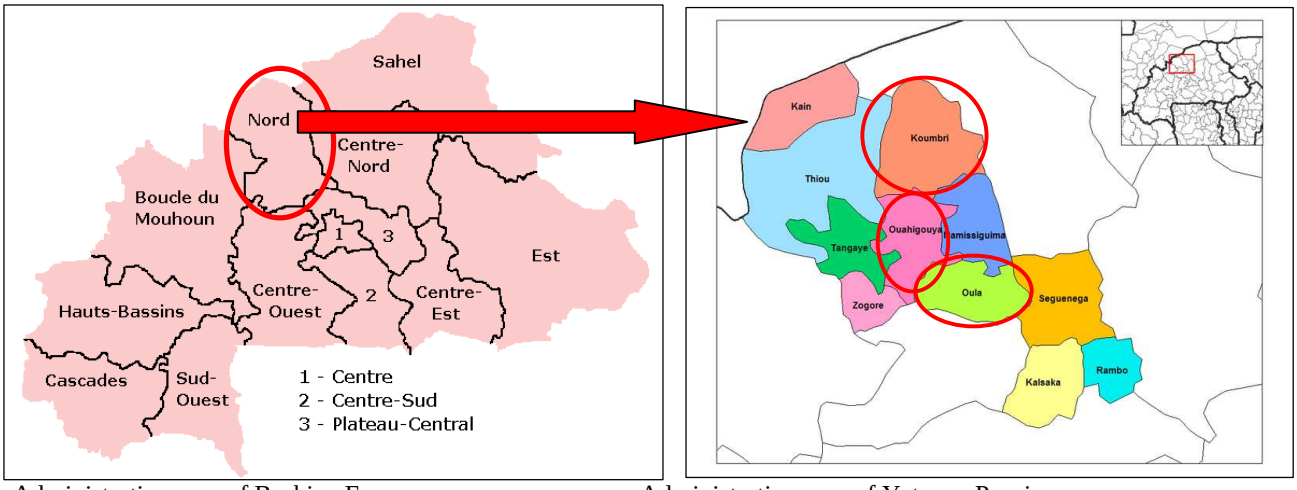
### II.1.1. Context of Study

This study is linked to Volta2 project, launched in December 2010 for 3 years around integrated management of rainwater for crop-livestock agrosystems in 2 West African countries (Burkina Faso and Ghana). The aim of study is to appreciate the impact of the structure of innovation platform members, their conduct, and the consequence on the improvement of performance of crop and livestock production in four focus villages of Yatenga province.

### II.1.2. Study Area

#### II.1.2.1. Presentation of Study Area

This study was conducted in North region of Burkina Faso, precisely in the province of Yatenga. In this Yatenga province the study was conducted in 3 communes and focused on four villages: two villages in Oula commune (Koura Bagre and Ziga), one village in Ouahigouya commune (Bogoya) and one village in Koumbri commune (Pogoro Silmimosse) (Fig.6). The study was conducted for 6 months from April to September 2013 with 2 months of field surveys between mid-May and mid-July 2013.




Administrative map of Burkina Faso — Administrative map of Yatenga Province

**Source:** Own elaboration adapted from Wikipedia

**Fig.6: Administrative map of Burkina Faso and Yatenga Province**

### II.1.2.2. Characteristic Description of Study Area

Yatagan province, by its position almost has the same physical characteristics as the entire northern region of Burkina Faso. Because of its physical setting, the northern region of Burkina Faso seems naturally disadvantaged. Indeed, it has physical constraints such as the phenomenon of erosion which leads to a continuous loss of soil fertility, erratic and low rainfall and a wildlife endangered **(Ripama and Sawadogo, 2009).**

The climat of northern region Burkina Faso is the Sudano-Sahelian climate which is characterized by the alternation of two seasons: a long dry season usually from October to May and a short rainy season from June to September. The months of July and August are periods of heavy rains. The region is influenced by the harmattan winds and monsoons. The harmattan blows from October to April with dry and cool winds (October to February) and hot dry winds (March and April). The monsoon season, in turn, corresponds to a moist air flow that brings rain, it extends from May to September. Rainfall is low and erratic with an annual rainfall of 600 to 700 mm.

In general, the physical characteristics of Yatenga province makes difficult the agriculture practice due to low soil fertility, low rainfall, lack of water and pasture for animals. This means a real need of adaptation of producers for the practice of agriculture in this area of Burkina Faso. Some particular agronomic techniques such as stone bunds, half-moons, zai, etc., are very practiced in this area of Burkina Faso for retain rainwaters and enhance soils fertility.

## II.1.3. Methodological Research Approach

This study was conducted based on approach proposed by **Cadilhon (2013)** illustrated in section I.3. of the first part.

### II.1.3.1. Sample

We have, first, made focus group discussions with innovation platform (IP) members in each of the four villages identified. Then, 3 questionnaires for individual surveys were administered: one questionnaire was administered to 57 members of the innovation platform, one questionnaire to 12 key stakeholders chosen among innovation platform members and one questionnaire to 9 facilitators or managers of innovation platform (appendix 1 to 4).

### II.1.3.2. Data Collection

The impact evaluation of innovation platform is based on focus group discussions and on questionnaires administered to members and facilitators or managers of innovation platform. The questionnaires capture the evolutions in the platform “structure”, “conduct” and “performance”. Statistical tools enable to demonstrate potentially significant relationships between structure, conduct and performance over time. It will be possible to attribute the relative share of the structure and ways of functioning of an innovation platform on its development outcomes. Besides individual surveys, we make different focus group discussions to understand well the

viewpoint of the stakeholders in terms of perception of innovation platform and it impact on their activities.

The questionnaire to IP members has three main parts related to structure, conduct and performance. The two latter parts are based mainly on 5-rank Likert scales so as to capture variability of stakeholders' opinions. Questions on structure of IP members aim to identify individual characteristics such as age, sex, gender, seniority within innovation platform (IP), level of education, participation to IP meetings, type of activity within IP, indicators of wealth, etc.; administered to innovation platform members. Questions related to structure aim also to identify the modus operandi of the innovation platform such as membership composition; decision making process; dedicated committees, units or sections; source of funding; staff availability, function and numbers; legal and regulatory framework; administered to facilitators or managers of innovation platform. Questions related to conduct aims to take the opinion of platform stakeholders on the way the platform facilitates interactions between chain members, administered to members and facilitators of the platform. Questions related to performance use selected indicators according to objectives agreed upon by innovation platform.

#### II.1.3.3. Data Analysis

For data analysis, SPSS software was used for factor analysis to identify the dominant constructs of what makes innovation platform successful. Then, regression analysis was done to determine the relationships between structure of innovation platform, the conduct of its members and whether they are achieving the objectives they set themselves in terms of improvement of crop and livestock production. Qualitative data was also interpreted to complete and interpret the results obtained through analysis of quantitative data.

## *II.2. Data Analysis Process and Results*

We present here, step by step, our data analysis process through factor analysis and regression analysis. Then we present the results obtained through regression analysis.

### II.2.1. Factor Analysis and Regression Analysis

#### II.2.1.1. Factor Analysis

We are going to make the factor analysis for elements of conduct and elements of performance in order to reduce the number of variables and limit the problem of multicollinearity between independent variables which will be used for regression analysis.

##### *II.2.1.1.1. Factor Analysis for Elements of Conduct*

We would like to make a factor analysis for eight variables of elements of conduct below:

26a. I attend periodic meetings of value chain actors to discuss common marketing problems;
26c. I use mobile phones to call other value chain partners to ask for market information;
28a. I exchange information with my value chain partners about my on-going activities;
28b. My value chain partners exchange about their on-going activities with me;

28c. I plan my activities according to the activities of my value chain partner;
29a. I can express my views freely in exchanges with my value chain partners;
29b. My value chain partners and I plan activities together according to our production potential and customer demand;
29c. My viewpoints is taken into account by my value chain partners when they plan their activities.

For the reason that our eight variables of elements of conduct above are based on a likert scale, we need to make the Cronbach's Alpha test to measure internal consistency (reliability) of the scale used for these eight variables before use them in our analyses. The Cronbach's Alpha test gives the results below.

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|---|---|---|
| ,815 | ,836 | 8 |

The table above shows that the Cronbach's alpha is **0.815**, which indicates a high level of internal consistency of our scale for the eight variables.

**Item-Total Statistics**

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|---|
| 26a. | 26,43 | 20,210 | ,605 | ,467 | ,782 |
| 26c. | 26,39 | 20,163 | ,416 | ,296 | ,825 |
| 28a. | 26,20 | 20,521 | ,722 | ,913 | ,768 |
| 28b. | 26,20 | 20,681 | ,678 | ,893 | ,774 |
| 28c. | 26,63 | 21,038 | ,508 | ,376 | ,798 |
| 29a. | 25,25 | 25,474 | ,380 | ,285 | ,816 |
| 29b. | 27,10 | 19,730 | ,588 | ,478 | ,786 |
| 29c. | 26,08 | 23,434 | ,595 | ,641 | ,795 |

We can see on Item-Total Statistics tableau above that removal of any question, except questions 26c and 29a, would result in a lower Cronbach's alpha. However, removal of questions 26c and 29a not bring enough improvement in Cronbach's alpha (0.821 instead of 0,815). Also we can see that the Corrected Item-Total Correlation value are not too low (0.416 for 26c and 0.380 for 29a) for these two items. So we can keep these two variables in our analyses.

For factor analysis, we consider the following six variables: 28a, 28b, 28c, 29a, 29b, 29c.

**KMO and Bartlett's Test**

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | ,689 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 171,230 |
| | df | 15 |
| | Sig. | ,000 |

KMO is 0.689 > 0.5, which mean an adequacy of the 6 variables used for factor analysis. Bartlett's Test of sphericity shows a significacity of 0.000, which mean that all correlations are not equal to zero (all variables are not independents). These two conditions of KMO and

Bartlett's Test are good and confirm the possibility to use the 6 variables for factor analysis. Factor analysis gives the results below.

**Total Variance Explained**

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 3,208 | 53,468 | 53,468 | 3,208 | 53,468 | 53,468 |
| 2 | 1,103 | 18,381 | 71,848 | 1,103 | 18,381 | 71,848 |
| 3 | ,746 | 12,435 | 84,283 | | | |
| 4 | ,500 | 8,337 | 92,620 | | | |
| 5 | ,387 | 6,448 | 99,067 | | | |
| 6 | ,056 | ,933 | 100,000 | | | |

Extraction Method: Principal Component Analysis.

Total variance explained shows that two component explain 71,85% of variables. The component matrix below expresses the loading of each variable on the two factors.

**Component Matrix[a]**

| | Component | |
|---|---|---|
| | 1 | 2 |
| I exchange information with my value chain partners about my on-going activities | ,880 | ,253 |
| My value chain partners exchange about their on-going activities with me | ,852 | ,378 |
| My viewpoint is taken into account by my value chain partners when they plan their activities | ,771 | -,362 |
| My value chain partners and I plan activities together according to our production potential an customer demand | ,699 | -,381 |
| I plan my activities according to the activities of my value chain partner | ,655 | -,442 |
| I can express my views freely in exchanges with my value chain partners | ,444 | ,652 |

Extraction Method: Principal Component Analysis.
a. 2 components extracted.

After rotation, we have the rotated component matrix below:

**Rotated Component Matrix[a]**

| | Component | |
|---|---|---|
| | 1 | 2 |
| My viewpoint is taken into account by my value chain partners when they plan their activities | ,823 | ,218 |
| I plan my activities according to the activities of my value chain partner | ,786 | ,082 |
| My value chain partners and I plan activities together according to our production potential an customer demand | ,780 | ,157 |
| My value chain partners exchange about their on-going activities with me | ,410 | ,837 |
| I can express my views freely in exchanges with my value chain partners | -,078 | ,785 |
| I exchange information with my value chain partners about my on-going activities | ,512 | ,759 |

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 3 iterations.

Through this factor analysis we have two factors (factor 1 = FAC1_1 and factor 2 = FAC1_2) which are going to be our new variables that we will use as a part of elements of conduct in our regression analysis.

The factor 1 regroups the 3 questions below:

29.c. My viewpoint is taken into account by my value chain partners when they plan their activities;
28.c. I plan my activities according to the activities of my value chain partner;
29.b. My value chain partners and I plan activities together according to our production potential and customer demand.

We have called this factor 1 “Joint Planning”, which reflects the ability of stakeholders to work by concertation and by planning their activities together.

The factor 2 regroups the questions below:

28.a. I exchange information with my value chain partners about my on-going activities;

28.b. My value chain partners exchange about their on-going activities with me;

29.a. I can express my views freely in exchanges with my value chain partners.

We have called this factor 2 “Coordination”, which reflects the ability of stakeholders to work by coordinating their activities together.

In sum, we have the two new variables below that we will use as a part of elements of conduct in our regression analyses:

- FAC1_1: Joint Planning of activities among value chain stakeholders
- FAC1_2: Coordination of activities among value chain stakeholders

#### *II.2.1.1.2. Factor Analysis for Elements of Performance*

We are going to make two factor analyses to reduce the number of variables for the elements of performance.

- **First factor analysis of elements of performance**

We are going to make the first factor analysis for following six variables:
34a. I can borrow money when I am in need from financial services
34b. I have been able to obtain credit in the area more easily in the past two years
37b.The prices I pay for crop and animal husbandry inputs are good value
40a. My knowledge about my activity has improved in the past 2 years
55i. I have easy access to agricultural equipments
55j. I have easy access to storage equipments

First, we need to make the Cronbach's Alpha test to measure internal consistency (reliability) of the scale used for these six variables before use them for factor analyses.

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|---|---|---|
| ,752 | ,757 | 6 |

We can see that Cronbach's alpha is **0.752**, which indicates a high level of internal consistency of our scale for the six variables.

**Item-Total Statistics**

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|---|
| 34a. | 14,90 | 11,463 | ,508 | ,510 | ,737 |
| 34b. | 15,90 | 7,674 | ,594 | ,714 | ,689 |
| 55i. | 17,50 | 10,684 | ,363 | ,193 | ,746 |
| 55j. | 16,00 | 7,263 | ,802 | ,690 | ,609 |
| 37b. | 16,20 | 9,326 | ,518 | ,322 | ,708 |
| 40a. | 15,00 | 10,632 | ,303 | ,374 | ,762 |

We can see on Item-Total Statistics tableau above that removal of any question, except questions 40a, would result in a lower Cronbach's alpha. However, removal of question 40a does not bring enough improvement in Cronbach's alpha (0.762 instead of 0,752). Also we can see that the Corrected Item-Total Correlation value are not too low (0.303) for this item. So we can keep this variable in our analyses.

Now we can make the factor analysis with the six variables: 34a, 34b, 55i, 55j, 37b, 40a.

**KMO and Bartlett's Test**

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | ,598 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 36,394 |
| | df | 15 |
| | Sig. | ,002 |

KMO is 0.598 > 0.5, that mean a mean an adequacy of the 6 variables used for factor analysis. Bartlett's Test of sphericity shows a significance of 0.002, that mean that all correlations are not equal to zero (all variables are not independents). So these six variables can be used for factor analysis. The factor analysis shows the results below.

**Total Variance Explained**

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 2,819 | 46,982 | 46,982 | 2,819 | 46,982 | 46,982 |
| 2 | 1,036 | 17,275 | 64,257 | 1,036 | 17,275 | 64,257 |
| 3 | ,992 | 16,540 | 80,797 | | | |
| 4 | ,608 | 10,139 | 90,936 | | | |
| 5 | ,391 | 6,522 | 97,458 | | | |
| 6 | ,153 | 2,542 | 100,000 | | | |

Extraction Method: Principal Component Analysis.

Total variance explained shows that two factors explain 64,257% of variables. The component matrix below expresses the loading of each variable on the two factors.

**Component Matrix[a]**

| | Component | |
|---|---|---|
| | 1 | 2 |
| I have easy access to storage equipments | ,887 | ,118 |
| I have been able to obtain credit in the area more easily in the past two years | ,819 | -,455 |
| I can borrow money when I am in need from financial services | ,671 | -,562 |
| The prices I pay for crop and animal husbandry inputs are good value | ,663 | ,428 |
| I have easy access to agricultural equipments | ,503 | ,251 |
| My knowledge about my activity has improved in the past 2 years | ,467 | ,503 |

Extraction Method: Principal Component Analysis.
a. 2 components extracted.

After rotation, we have the rotated component matrix below:

**Rotated Component Matrix[a]**

| | Component | |
|---|---|---|
| | 1 | 2 |
| I have been able to obtain credit in the area more easily in the past two years | ,904 | ,246 |
| I can borrow money when I am in need from financial services | ,873 | ,067 |
| The prices I pay for crop and animal husbandry inputs are good value | ,176 | ,770 |
| I have easy access to storage equipments | ,552 | ,703 |
| My knowledge about my activity has improved in the past 2 years | -,017 | ,687 |
| I have easy access to agricultural equipments | ,185 | ,531 |

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 3 iterations.

Through this factor analysis we have two factors (factor 1 = FAC2_1 and factor 2 = FAC2_2) which are going to be our new variables that we will use within the elements of performance in our regression analyses.

The factor 1 regroups the questions below:

34a. I can borrow money when I am in need from financial services
34b. I have been able to obtain credit in the area more easily in the past two years

We have called this factor 1 “Facility access to credit”, which reflects the impact of innovation platform in term of facility for its members to access to the credit from financial services.

The factor 2 regroups the questions below:

37b. The prices I pay for crop and animal husbandry inputs are good value
40a. My knowledge about my activity has improved in the past 2 years
55i. I have easy access to agricultural equipment’s
55j. I have easy access to storage equipment’s

We have called this factor 2 “Facility access to inputs and knowledge”, which reflects the impact of innovation platform in term of facility to access to agricultural inputs and knowledge.

- **Second factor analysis of elements of performance**

We are going to make the second factor analysis for the elements of performance with the four variables below:

55c. My animal and vegetal production is increasing
55d. My total quantity of products sold per year is increasing
55k. My production system has improved in the past 2 years
55l. My total production is increasing this last 2 years

We first need to make the Cronbach's Alpha test to measure internal consistency (reliability) of the scale used for these four variables before using them on our analyses.

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|---|---|---|
| ,747 | ,751 | 4 |

We can see that Cronbach's alpha is **0.747**, which indicates a high level of internal consistency of our scale for the four variables.

**Item-Total Statistics**

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|---|
| 55d. | 12,71 | 2,499 | ,518 | ,294 | ,710 |
| 55c. | 12,43 | 2,468 | ,603 | ,375 | ,653 |
| 55k. | 12,25 | 3,173 | ,439 | ,232 | ,741 |
| 55l. | 12,16 | 2,683 | ,633 | ,409 | ,642 |

We can see on Item-Total Statistics tableau above that removal of any question would result in a lower Cronbach's alpha. So we can keep all four variables in our analyses.

Now we can make the factor analysis with the four variables.

**KMO and Bartlett's Test**

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | ,744 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 50,337 |
| | df | 6 |
| | Sig. | ,000 |

KMO is 0.744 > 0.5, which mean an adequacy of the four variables used for factor analysis. Bartlett's Test of sphericity shows a significance of 0.000, that mean that all correlations are not equal to zero (all variables are not independents). So these four variables can be used for factor analysis. The factor analysis shows the results below.

**Total Variance Explained**

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 2,301 | 57,526 | 57,526 | 2,301 | 57,526 | 57,526 |
| 2 | ,754 | 18,840 | 76,365 | | | |
| 3 | ,505 | 12,615 | 88,980 | | | |
| 4 | ,441 | 11,020 | 100,000 | | | |

Extraction Method: Principal Component Analysis.

Total variance explained shows that one factor explain 57,526% of variables. The component matrix below expresses the loading of each variable on this factor.

**Component Matrix[a]**

| | Component |
|---|---|
| | 1 |
| My total production is increasing this last 3 years | ,826 |
| my animal and vegetal production is increasing | ,801 |
| my total quantity of products sell per year is increasing | ,731 |
| There improving of my production system this last 3 years | ,667 |

Extraction Method: Principal Component Analysis.
a. 1 components extracted.

So, through this factor analysis, we get a new variable for elements of performance (FAC1_3). We have called this variable "Improvement and increasing of crop and livestock production", which reflects the impact of innovation platform project in terms of improvement of crop and livestock production systems.

In sum, for three new variables that we got through factorial analysis of elements of performance, we are going to retain the two variables below that we will use as a part of elements of performance in our regression analyses:

- FAC2_2: Facility access to inputs and knowledge
- FAC1_3: Improvement and increasing of crop and livestock production

## II.2.1.2. Regression Analysis

### *II.2.1.2.1. Definition of Variables for Regression Analysis*

We would like to see the impact of IP in terms of two following dependent variables:

- FAC1_3: Improvement and increasing of crop and livestock production;
- FAC2_2: Facility access to inputs and knowledge.

We need now to define independent variables that can explain each of these two dependent variables in order to be able to write the theory model of our regression through this general model: $Y = a + b_1x_1 + b_2x_2 + \ldots + b_nx_n + u$;

Where Y = dependent variable; a = constant; $x_1$, $x_2$, …, $x_n$ = independent variables; $b_1$, $b_2$, …, $b_n$ = slope of each independent variables and u = error for the model.

- **Improvement and increasing of crop and livestock production**

This dependent variable can be explained by some variables from the elements of structure and from the elements of conduct.

For the variables from the elements of structure we can have the following variables: gender, age, seniority within the IP (Senio_IP), level of education (High_ed), participation to IP meeting (Ptici_IP), principal source of income (Prin_SR) and average of income per year (R_year). The principal source of income has 2 categorical variables which are: 1) agricultural activities; 2) non-agricultural activities. The variable seniority within IP also corresponds to 2 categorical

variables: one for IP members who joined the IP at the beginning in 2011 and the other for those joining the IP in 2012.

For the variables from the elements of conduct we can have the following variables:

FAC1_1: Joint Planning of activities among value chain stakeholders and 25c: Extension agents usually provide information that is relevant to my needs and production calendar.

So, we can write the first theoretical model of regression analysis below:

$$FAC1\_3 = a + b_1 gender + b_2 age + b_3 Senio\_ip + b_4 High\_ed + b_5 Ptici\_IP + b_6 Prin\_SR + b_7 R\_year + b_8 FAC1\_1 + b_9 25c + u$$

- **Facility access to inputs and knowledge**

This dependent variable can be explained by some variables from the elements of structure and from the elements of conduct.

For the variables from the elements of structure we can have the following variables: gender and participation to IP meeting (Ptici_IP).

For the variables from the elements of conduct we can have the following variable:

FAC1_2: Coordination of activities among value chain stakeholders.

So, we can write the second theoretical model of regression analysis below:

$$FAC2\_2 = a + b_1 gender + b_2 Ptici\_IP + b_3 FAC1\_2 + u$$

We can note here that for both the independent variables above there very little explanatory variables. This is due to the little size of our sample and the non-compliance of assumptions of linear regression by many of explanatory variables when they are used in the model.

### *II.2.1.2.2. Regression Analysis Outputs*

- **Improvement and increasing of crop and livestock production**

**Model Summary[b]**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|---|---|---|---|---|---|
| 1 | ,736[a] | ,542 | ,439 | ,71110487 | 2,101 |

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 23,973 | 9 | 2,664 | 5,268 | ,000[b] |
| | Residual | 20,227 | 40 | ,506 | | |
| | Total | 44,200 | 49 | | | |

**Coefficients[a]**

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|
| | B | Std. Error | Beta | | | Tolerance | VIF |
| (Constant) | ,580 | 1,290 | | ,450 | ,655 | | |
| Participation in IP meetings | ,447 | ,151 | ,343 | 2,951 | ,005 | ,846 | 1,182 |
| seniority within IP | -,554 | ,288 | -,216 | -1,925 | ,061 | ,909 | 1,101 |
| Your average income per year in dollars | ,001 | ,000 | ,262 | 1,834 | ,074 | ,561 | 1,783 |
| Your main source of income? | -,984 | ,481 | -,284 | -2,044 | ,048 | ,593 | 1,687 |
| Joint Planning of activities among value chain stakeholders | ,356 | ,111 | ,379 | 3,199 | ,003 | ,816 | 1,226 |
| age | -,014 | ,010 | -,177 | -1,386 | ,173 | ,701 | 1,426 |
| gender | ,414 | ,354 | ,132 | 1,169 | ,249 | ,897 | 1,115 |
| highest level of education | -,086 | ,299 | -,050 | -,287 | ,776 | ,375 | 2,668 |
| extension agents usually provide information that is relevant to my needs and production calendar | ,204 | ,161 | ,174 | 1,266 | ,213 | ,606 | 1,651 |

a. Dependent Variable: improvement and increasing of crop and livestock production

**Test of Homogeneity of Variances**

Unstandardized Residual

| Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|
| 1,752 | 5 | 31 | ,152 |

**Tests of Normality**

| | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|
| | Statistic | df | Sig. | Statistic | df | Sig. |
| Unstandardized Residual | ,110 | 50 | ,180 | ,958 | 50 | ,071 |

a. Lilliefors Significance Correction

## ➢ Facility access to inputs and knowledge

**Model Summary[b]**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|---|---|---|---|---|---|
| 1 | ,657[a] | ,432 | ,325 | ,82162359 | 2,445 |

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 8,199 | 3 | 2,733 | 4,048 | ,026[b] |
| | Residual | 10,801 | 16 | ,675 | | |
| | Total | 19,000 | 19 | | | |

**Coefficients[a]**

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|
| | B | Std. Error | Beta | | | Tolerance | VIF |
| (Constant) | -1,517 | ,966 | | -1,570 | ,136 | | |
| gender | -,716 | ,425 | -,318 | -1,684 | ,112 | ,996 | 1,004 |
| Coordination of activities among value chain stakeholders | ,068 | ,190 | ,068 | ,358 | ,725 | ,989 | 1,011 |
| Participation in IP meetings | ,754 | ,246 | ,579 | 3,060 | ,007 | ,993 | 1,007 |

a. Dependent Variable: Facility access to inputs and knowledge

**Test of Homogeneity of Variances**

Unstandardized Residual

| Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|
| ,015 | 1 | 11 | ,906 |

**Tests of Normality**

| | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|
| | Statistic | df | Sig. | Statistic | df | Sig. |
| Unstandardized Residual | ,159 | 20 | ,198 | ,919 | 20 | ,095 |

a. Lilliefors Significance Correction

### *II.1.6.1.2.2. Respect of Assumptions of Linear Regression*

Here we want to show whether our data used for each model of multiple regression above meet the assumptions of linear regression. In particular, we will consider the following assumptions.

- **Test of Normality**

All the data used in each of our 2 models show that the errors are normally distributed. Indeed, the signification of the test of Kolmogorov-Smirnov is above 0.05 for the data use for each 3 models of multiple regressions.

- **Homogeneity of error variance (homoscedasticity)**

The error variance is constant for all data used in each of our 2 models. The signification of levene test of error variance is above 0.05, which means the homoscedasticity of the error variance.

- **Test of no perfect multicollinearity**

There is no perfect linear relationship between two or more independent variables. This premise can be checked with the VIF (Variance Inflation Factor) which is lower than 3 for all independent variables used in our 2 regression models.

- **Test of Independence**

**T**he errors associated with one observation are not correlated with the errors of any other observation. This is confirmed by the test of Durbin-Watson with the value between 1 and 3 for all the data used in our 2 models.

## *II.3. Analysis and Discussion of Results*

This part aims to analyse and discuss the results of impact assessment of innovation platform for increasing crops and livestock productions in four villages of Yatenga province, Northern Burkina Faso. For this analysis and discussion, we are going to combine the results of regression analysis with the qualitative data got from different interviews during field work.

### II.3.1. Discussion on Method Used for this Study

The method used for this study is based on the socioeconomic model of Structure – Conduct – Performance (SCP) proposed by **Bain in 1959** for industrial market economy. Although this method was proposed to us by the host laboratory, we find it very interesting and appropriate to the context of study.

In the context of rural activities in developing countries it is not always easy to apply the common approaches of impact evaluation of projects which presuppose the quantification of all activities created or deleted by the new project in order to measure the real impact of this new project on the community by taking in account both its positive and negative externalities. Indeed, it is not possible to quantify the real impact of a project on its beneficiaries through these common approaches in the context of developing countries such as Northern Burkina Faso where farmers are generally supported by different types of projects. The variations in the output of farmers are the common result of actions of different types of projects. It is thus difficult in this context to link the impact of one project on its beneficiaries through quantitative approach. The approach based on triangulation of qualitative approach (focus group discussions) and quantitative approach (Likert Scale measurement) is thus more appropriate.

Therefore, the improvement in crop and livestock production, in northern Burkina Faso, was measured by asking farmers for their perception of this improvement. We are confident to use this proxy rather than an actual measure of crop or livestock production because **Liebig and Doran (1999)** have found that Nebraskan farmers' perception of soil quality indicators was correct or nearly correct 75% of the time. This past finding backs our using the perception of farmers to measure variations in the output of their main activity: crop and livestock production.

### II.3.2. Improvement and Increasing of Crop and Livestock Production

The theoretical model shows that only three variables are statistically significant at 5% probability or less to explain the improvement and increase of crop and livestock production: joint planning of activities among value chain stakeholders, participation in IP meetings and main source of income.

- **Joint Planning of Activities Among Value Chain Stakeholders**

According to regression results, joint planning of activities among value chain stakeholders has contributed significantly to the improvement and increase of crop and livestock production.

Indeed, the members of IP during the field surveys have testified the role played by IP in terms of planning their activities. IP has created closer working relationships among IP members within the same village by exchanging knowledge in their activities, planning their activities and thinking together how to resolve common problems. This ability of IP members to work together to find solutions to common problems is one of the main objectives that highlights the definition of innovation platforms **(ILRI, 2012)**. IP members who also belong to other groups or associations said the IP brought them to work in a network and integrated way for mutual help; this was the main difference between working within an IP and other groups or associations. IP has also opened them to new partners such as the structures of micro-credit and IP members of other villages. IP has also strengthened the partnership of its members with the services of livestock, agriculture or animal health.

As was evoked by some IP members, IP has taught them that the work together is a powerful thing to help them to improve mutually their activity and their income. All members of value chain are important to others and no one can improve his activity by not taking in account the other value chain partners.

Thus, how joint planning of activity among value chain stakeholders has really contributed to improvement and increasing of crop and livestock production in the four villages of Yatenga province?

The IP members declared that through joint planning of the activities, they have finally understood that when their animals have diseases, they can call immediately the service of animal health, which they did not do before. A consequence of this has been reduced mortality through the timely treatment of the sick animals. The producer members of IP have learned the necessity to prepare for marketing of their produce even before production by contacting the traders on their requirements. This has resulted in the improvement of market access, which contributes to the improvement and increase of their production. This improvement of market access corresponds to one main function of innovation platforms, evoked by **Hekkert and Negro (2009)**, which is the function of market formation. Through the IP, the members have also learned about the necessity for them to plan their activity by interacting with some organizations such as agricultural and phytosanitary services of the agricultural ministry, in order to access to inputs and other services for their activities. For example, before the IP, some producers did not use improved seeds. With IP, they began to use improved seeds and also tried to see how they could make a good combination between improved and unimproved seeds. Indeed, according to what was said by some producers, using the improved seeds is profitable when there is good rainfall and they also offer the possibility that their residues can be further used for animal feed. But with low rainfall, use of the improved seeds is less profitable than the unimproved seeds. So, the strategy of these producers is to combine both types of seeds in their production in order to produce in the context of uncertain rainfall. This adaptation of producers, through innovation platforms, backs the assertion of **Nederlof et *al.* (2011)** that farmers need to intensify their

production systems and adapt to continuous, often unforeseen and sudden changes in their production, which presupposes continuous innovation.

There are other impacts of joint planning which have not yet borne fruit. Indeed, the IP has raising awareness its members about the necessity to conduct their activities by taking into account the possibility to borrow money from micro-credit institutions. Awareness was also raised by the IP on the warehouse receipt system. The implementation of this system means that IP members need to plan their activities by linking up with the micro-credit institutions. The warehouse receipt system can help producers not to sell their product at low prices during harvesting through access to credit for their needs and thus keep their harvest for sale during the period when the prices are good on the market. This system is yet to be implemented, but what is interesting is that many IP members find this idea very interesting to improve their market access and their income, which is one main function of innovation platforms **(Hekkert and Negro, 2009)**.

- **Participation in IP Meetings**

The regression analysis shows that participation of IP members at IP meetings has significantly contributed to improving the members' perception of increases in their crop and livestock production. As evoked by IP members, capacity development is one thing that can differentiate their mode of collaboration within the IP from that of other organizations, because the IP emphasizes on capacity development of its members. IP meetings are the base for exchanging information and knowledge between different participants of the platforms, an essential function of networks as was asserted by **Carlsson and Stankiewicz (1991)**. Indeed, through IP meetings, IP members have received various training on crop and livestock production, techniques of feeding and animal husbandry, market access, composting, construction of enclosures, etc. IP members during focus group discussions have emphasized the importance of training and advice that they have received from the IP in changing their practices and they suggested these training and advice should continue. Specifically various training and technical advice received by IP members during different meetings have contributed to the improvement of their knowledge in their activities and thus contributed to the improvement and increase of crop and livestock production.

- **Main Source of Income**

According to the results from regression analysis, main source of income has a statistically significant impact (at 5% level) on the interviewee's perception of improvement and increase of crop and livestock production. This means that IP members whose main source of income comes from agriculture also report improved crop and livestock production compared with respondents who have non-agricultural activities as their main source of income. Farmers are likely to contribute more to the improvement of crop and livestock production than those whose main source of income comes from non-agricultural activities. Likewise within the IP, members whose main source of income comes from agriculture probably mobilize their time and means through

the platform for improvement of their agricultural activities. Indeed, resources mobilization, both financial and human capital, are necessary as a basic input to all the activities within the Innovation system and which determine the success or failure of a project (**Hekkert and Negro, 2009).**

### II.3.3. Facility access to inputs and knowledge

The results show that the participation to IP meetings by IP members has significantly contributed to facilitate their access to inputs and knowledge. Indeed, different meetings with different stakeholders make IP members work closer together with different agricultural support services such as agricultural and phytosanitary services, veterinary services, National Federation of Naam Groups (private local organization), etc. So, different IP meetings have given facility access to inputs for IP members by helping them to know where they can buy different inputs for their needs through different agricultural support services listed above. Also, during the two first years of its operation, IP was provided free improved seeds and fertilizers to its members, which can also explain the facility access to inputs evoked by IP members. Specially, concerning facility access to knowledge, as we already explained above, IP meetings have procured many trainings and advice to IP members which have contributed to the improvement of their knowledge in their activities.

### II.3.4. More qualitative results about contribution of IP to increasing of crop and livestock production

Different focus group discussions and individual surveys with IP members and facilitators have contributed to get more qualitative data about the impact of innovation platform, set up by Volta2 project, on IP member's practices in Yatenga province. For example, through the analysis of qualitative data we are able to identify two socioeconomic concepts which result in positive impact of IP on its members, by changing their practices and their conduct, contributing thus to the improvement and increasing of crop and livestock production.

Innovation platform has contributed to the capacity development of its members through the reinforcement of their human and social capacity. Human capacity was improved through different trainings and advice received by IP members from different facilitators of innovation platform, such as training in animal and vegetal productions, training in access to market, training in management of rainwater for crops and livestock production, etc. Social capacity of IP members was improved through new contacts and new partners that they have got in their activities. Indeed, through innovation platform, IP members of one village have entered in contact with IP members of other villages. Innovation platform have contributed to closer working relationships among IP members within the same village and to villagers gaining easier access to some organisations such as micro-credit organisations, animal husbandry and phytosanitary services of the agricultural ministry, veterinary services, etc., which can help them to improve their activities. This improvement of human and social capacity of IP members has

resulted in the improvement of crop and livestock production through a better exchange of information and knowledge between different stakeholders and a better access to different support services and inputs. This means, thus, the improving of the existing situation or conditions around a common interest by bringing desired change, as evoked by **Tenywa et al (2011)** in their definition of innovation platform.

IP also contributed to change the mode of operating of its members. Indeed, IP members have learned about the importance of integrated work or the joint planning of activities. As evoked by some IP members this necessity of integrated work, learned through IP, has also positively affected their mode of operating within the family and reinforced the unity within the village. Some change in mode of operating come from market access by IP members. Before IP, its members sold their products without any previous work. But today they know that before sell their products they have needs to get information's concerning the market, for example by exchange with producers from other villages, by calling other friends from other place to get information's about the market; in order to know where they can sell their products at good value. This changing in mode of operating contribute to market formation evoked by **Hekkert and Negro (2009)** in the definition of IP functions, and is very interesting for producer's members of IP to improve their income and thus the increasing of crop and livestock production.

The other importance of integrated work developed by IP, is that, beyond the unity, it created more trust within IP members in different villages. This unity and trust have contributed to improve the facility of work together through better help by exchange for example the agriculture materials for the work, from those who have to those who don't have; by facilitating of borrow money between them; by more sharing of experiences in the activities; etc. This importance of unity and trust is also supported by **FAO (2005)**, by saying that in Africa, credit institutions often develop at the local level based on trust. It is the same in Northwest Province of Cameroon with some local credit institutions, known as "Tontine" in the local language, which are based on mutual trust.

Beside aptitude of integrated work appears, in addition of joint planning, the notion of coordination and capacity building among IP members. Indeed, the survey with key stakeholders within IP members testifies to a better coordination of IP members in their activities. Through IP, its members, nowadays, mutually exchange information's about their ongoing activities, especially during different periodic meetings that they now organise in the village. This helps them to mutually share knowledge in their activities, think together about their common problem and how improving their activities. The improvement of coordination and joint planning among IP members has thus contributed to the improvement of their activities such as increasing of crop and livestock productions.

At the end, as evoked by some IP members, IP also contributed in terms of extension of their area of land cultivated. Indeed, IP members have improved their knowledge on how to retain rainwaters and enhance soils fertility through different agronomic techniques such as stone

bunds, half-moons, zai, etc. This has conducted the IP members to the valorization of lands which couldn't be valorized before, and thus the increasing of area of land cultivated which also mean an increasing of crop productions.

## *II.4. Partial Conclusion*

The impact assessment of innovations platform in four focus villages of Yatenga province (North Burkina Faso), shows the positive impact of innovation platform on its members and especially its contribution for improvement and increasing of crop and livestock productions. What is very interesting on results is that the triangulation of quantitative method (regressions analyses) and qualitative method (interpretation of sayings of respondents through focus group discussions) used in this research leads us to the same results, which makes the findings more robust.

The results show that IP has contributed to changing mentalities of its members and their practices in their activities by giving them many training and advices which allowed them to improve their mode of operating and their knowledge in their activities. Capacity development was improved through the development and reinforcement of social and human capacity of IP members. The improvement of human and social capacity of IP members has resulted in the improvement of crop and livestock production through a better exchange of information and knowledge between different stakeholders and a better access to different support services. Joint planning and coordination among IP members are also improved through innovation platform. Indeed, IP has contributed to the development and the reinforcement of joint planning and coordination within its members, by making them work more closely and integrated and better exchange information's in their activities, which resulted in an improvement of their activities and thus the improvement of crop and livestock production.

All this leads us to conclude for the positive impact of innovation platform in the four focus villages of Yatenga province and its contribution for achieving the objectives set in terms of increasing of crop and livestock production. However, this study presents some limits that can be discussed for recommendations.

Concerning the methodological approach, for the reason that it was difficult to make the impact evaluation of volta2 innovation platform on its beneficiaries through quantitative measurements, we have used qualitative approach to assess to this impact through the sayings of respondents. The counterfactual analysis would have been a good way to overcome the limits of this qualitative approach. But we have not had enough time during the field work to do this counterfactual analysis.

For the data collection, we have used the likert scale. But it was not as easy for respondents to adjust the information with likert scale. However, we have tried to overcome this problem by how to ask the question. Also, it is difficult for a survey, through an interpreter, to be sure that what we want to say is transposed in real terms to respondents. We have tried to reduce these

biases by discussing with interpreter on different points of questionnaire before surveys and also during the survey at any time when we have some doubts about the reformulation of question by the interpreter.

For data analysis, in reason of the small size of our sample due to small number of IP members, it has not been easy to proceed to data analysis. However we have tried to get some interesting and statistically robust results despite this problem of size of our sample.

Other limit resides in very short duration of this volta2 project of innovation platform which was set up in June 2011 in Yatenga province. This short duration constitutes some limits in term of appreciation of impact of this project, in particular the impacts on the medium and long term, which have not been taking in account.

## General Conclusion and recommandations

This study was intended to make an impact assessment of innovation platform, set up by volta2 project in Yatenga province, in north region of Burkina Faso. The study was conducted in two main parts.

The first part deals with the bibliographic review on innovation platform to understand well the signification of this concept through its definitions, mode of process and operation and functions. Then, we have tried to understand the theoretical and conceptual framework for impact assessment of innovation platforms. This first part allowed us to have some knowledge that we have capitalized for the impact assessment of volta2 innovation platform in Yatenga province.

The second part deals with the methodological approach for impact assessment of vota2 innovation platform, the results and discussions for the end of recommendations. For this, we have used one approach borrowed from socio-economic theory: the model of structure – conduct – performance (SCP). This approach allowed us, through field surveys based mainly on 5-rank likert scale, to collect information on structure, conduct and performance of innovation platform. The improvement in crops and livestock production was measured by asking farmers for their perception of this improvement. Statistical and qualitative analysis of collected information's gives us some results on impact of innovation platform, mainly in terms of increasing of crop and livestock productions.

Innovation platforms have contributed to the change of mode of conduct of its members in their activities. Through IP, its members have benefited from different support in their activities, which have contributed to their capacity development. IP members' developed capacity resulted in the reinforcement of human and social capacity through a better exchange of information and knowledge, a better interaction between different stakeholders and a better access to different support services. Joint planning and coordination of activities among IP members were also improved through closer work, and a better exchange of information in their activities. All these

improvements have resulted in the improvement and increase of crop and livestock production measured by the respondents' perception of these improvements.

Thus, this study shows a positive impact of the innovation platforms set up by Volta2 project in Yatenga province. The platforms have indeed contributed to achieving the objective set by the platform members in terms of increasing their crop and livestock production. These findings justify the necessity to support this kind of project in the perspective of reinforcing food security and reducing poverty in rural areas around the world.

Following this study, we can make a number of recommendations to members and organisers or facilitators of innovation platforms.

- **Recommendations to IP members:**
  - It could be interesting for IP members of the four villages to organize exchange visits for sharing information and knowledge in their activities;
  - It is important for IP members to understand that an IP is a technical support for their activities and not a financial support. The IP is there to help them improve their activities through the development of their capacity;
  - IP members should ensure a continuity of activities begun after the end of the project, especially by working closer with structures of micro-credit and other agriculture support services, by continuing to exchange information and knowledge on their activities, etc.;
  - IP members could experiment the creation of a local credit system, called tontine in North West Province of Cameroon, by continuing to work in unity and trust;
  - IP members should experiment the warehouse receipt system which would allow them to improve their market access and their income.

- **Recommendations to organisers or facilitators of innovation platform:**
  - The organisers or facilitators should extend IP activities for 2 more years at least. Indeed, both IP members and field facilitators think that it is very early to stop IP activities at the end of the project's third year because IP members are not sufficiently prepared to continue alone the activities started by the IP;
  - The organisers or facilitators of the IP should extend this experience of innovation platforms to other villages in order to benefit value chains of these other villages;
  - It is very important for organisers or facilitators of innovation platforms to help IP members acquire a legal status because without a legal status IP members cannot undertake any formal action. Indeed, as pointed out by some IP members, acquiring a legal status could help them achieve various objectives, such as accessing credit as a group, obtaining further funding for their activities, etc.;

- For other future projects using the innovation platform approach, organisers or facilitators need to better engage with the decentralized structures of the government and their different agriculture support services. These decentralized structures need also to be supported financially by the project in order to be able to move frequently for monitoring of activities in the field;

- The structures of microcredits should facilitate the access to credits to IP members, especially by extending the duration of refund taking in account the long cycle in agricultural productions;

- Finally, organisers and facilitators of innovation platforms should pay more attention to the respect of their engagement towards IP members. Indeed, many IP members have raised the problem of lack of respect of some promises made such as outside exchange visit, the appointment of a person for the daily monitoring of their activities, etc. Also, some IP members pointed out the non-respect of time during IP meetings and the weak support for their transport to IP meetings.

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# Appendix

**Appendix 1: Questionnaire for focus group discussions with innovation platforms members**

***Introduction for Focus Group Discussions***

- Welcoming the participants and have one of them open with a word of prayer or whatever is appropriate in the community
- Facilitator introduce himself and the team and have participants introduce themselves (also indicating which group they represent)
- Introduce the organizations involved and the V2 project, highlighting the objectives and the important role of the participants in meeting the objectives
- Asking for consent to use cameras or tape recorders (if any)
- Setting the ground rules together with the participants (assigning time for each speaker and focusing on the main/relevant issues for the study)

***Questions***

1. What are the main value chains in the community? Who are the main actors?
2. Where are the markets for crop and livestock products? Both input and output markets. How far are they from the village? What are the main means of transport?
3. Is there a gender difference in the practice of certain activities in the community? If yes, provide details of these differences or restriction explaining why.
4. What are the local indicators of wealth? How are they related to participation in livestock production and crop farming?
5. What distinguishable wealth groups exist in the village? Who is poor and who is rich? Can we identify wealth group based on a rank from 1 (the poorest) to 5 (the richest)?
6. In which wealth group are female headed households usually lie? Why is it so?
7. Is it common in this area for women to own land and also become household head? If yes, are there gender based differences in access to or ownership of resources (such as livestock and land ownership)? If so, why do you think are the reasons?
8. What are the main commercial value chains in the community? Who are the main actors? Quelles sont les principaux enjeux et opportunités de ces filières ?
9. What strategies would you suggest to improve marketing activities within innovation platforms?
10. What strategies would you suggest to improve crop and livestock production within innovation platforms?
11. According to you, what impact the innovation platforms have had on improvement of animal and crop production in the community?
12. What do you think about the management of water for community use. There good management or does it needs some improvements? If need of improvement, at what levels of management this improvement should wear?
13. What other supports are available to the community (e.g. government program, active NGO, research organizations, assistance project, and local self-help group)? Describe
14. Apart from the IP, are you also part of other organizations? If yes, which ones ?
15. Would you be ready to be part of other forms of organization? If yes, please explain why.
16. More generally, please discuss among yourselves three positive and three negative lessons that you have learned from your involvement with innovation platforms.

***Thank you for your cooperation!***

## Appendix 2: Questionnaire for Individual survey with Innovation platforms members

### Objective of survey

I am a student research fellow working here on innovation platforms for my Master thesis.
We are doing a study to understand how your involvement in the innovation platform has changed your practices. I would like to ask you some questions about your activity and your relationships with your value chain suppliers and customers.

### Informed consent

If you accept to answer my questions, I want to make sure that you understand that all the information you give me will be kept anonymous. The information you will give me will not be associated to your name in any of our work or in our further interviews with other people working in this community.
If you want to know more about this research or if you have any comments or complaints, please call Hubert Somé (SNV Burkina).
If you want, we will inform you of the results of this study through a seminar.

### Questions on respondent background information

1. Sheet number: …….
2. Interview date: …….....
3. District name: ……..…
4. Community name: ……..
5. Respondent name ……
6. Telephone number
7. Gender M…… F…….
8. Age ……
9. Marital status (encircle the correct response number)

| | | |
|---|---|---|
| 1. Single | 2. Married | 3. Divorced |
| 4. Widowed | 5. Other …… | |

10. Number of persons in the household
11. Date of entry to IP ……
12. Highest level of education of respondent (encircle the correct response number)

| | | |
|---|---|---|
| 1. Never attended school | 2. Completed 4$^{th}$ grade | 3. Completed 8$^{th}$ grade |
| 4. Completed high school | 5. Certificate/diploma | 6. First degree and above |

13. Highest level of education completed by household head

| | | |
|---|---|---|
| 1. Never attended school | 2. Completed 4$^{th}$ grade | 3. Completed 8$^{th}$ grade |
| 4. Completed high school | 5. Certificate/diploma | 6. First degree and above |

14. Number of children in the household……
15. Number of household members who attended at least primary school …….
16. Number of school aged children not attending primary school …….
17. How many persons do you have financial responsibility over? .....
18. What is the surface of land you are currently cropping? …….. unit…….
19. How many cattle heads do you possess?.....
20. How many donkeys do you possess?.....
21. How many goat heads do you possess?.....
22. How many sheep heads do you possess?.....
23. How many poultry heads do you possess?.....
24. How many granaries do you possess? …….

**Questions on the indicators of Conduct**

25. ***Information sharing***

| ***1 = strongly disagree, 2 = disagree, 3 = indifferent, 4 = agree, 5 = strongly agree*** | **1** | **2** | **3** | **4** | **5** | **N/A** |
|---|---|---|---|---|---|---|
| a. I get knowledge about weighing scales and price standardizations from farmer representatives who participated in the innovation platform meetings and trainings | | | | | | |
| b. The information I get about the market is correct | | | | | | |
| c. Extension agents usually provide information that is relevant to my needs and production calendar | | | | | | |

26. ***Communication***

| ***1 = strongly disagree, 2 = disagree, 3 = indifferent, 4 = agree, 5 = strongly agree*** | **1** | **2** | **3** | **4** | **5** | **N/A** |
|---|---|---|---|---|---|---|
| a. I attend periodic meetings of value chain actors to discuss common marketing problems | | | | | | |
| a. I am satisfied with the communication frequency I had with value chain actors in recent business relationships | | | | | | |
| b. I use mobile phones to call other value chain partners to ask for market information | | | | | | |

*27.* ***Trust***

| ***1 = strongly disagree, 2 = disagree, 3 = indifferent, 4 = agree, 5 = strongly agree*** | **1** | **2** | **3** | **4** | **5** | **N/A** |
|---|---|---|---|---|---|---|
| a. The trust in my supplier/customer has been strong in recent value chain business relationships | | | | | | |
| b. There is high traceability in the market along the value chain | | | | | | |
| c. I have greater trust in my supplier/customer if they are also part of a group I am part of (family, tribe, ethnic group, religious faith, IP) | | | | | | |

*28.* ***Coordination***

| ***1 = strongly disagree, 2 = disagree, 3 = indifferent, 4 = agree, 5 = strongly agree*** | **1** | **2** | **3** | **4** | **5** | **N/A** |
|---|---|---|---|---|---|---|
| b. I exchange information with my value chain partners about my ongoing activities | | | | | | |
| c. My value chain partners exchange about their ongoing activities with me | | | | | | |
| d. I plan my activities according to the activities of my value chain partner | | | | | | |

*29.* ***Joint planning***

| ***1 = strongly disagree, 2 = disagree, 3 = indifferent, 4 = agree, 5 = strongly agree*** | **1** | **2** | **3** | **4** | **5** | **N/A** |
|---|---|---|---|---|---|---|
| c. I can express my views freely in exchanges with my value chain partners | | | | | | |
| e. My value chain partners and I plan activities together according to our production potential and customer demand | | | | | | |
| f. My viewpoints are taken into account by my value chain partners when they plan their activities | | | | | | |

**Questions on socioeconomic information of respondent**

30. Did the household experience food shortage in the past five years?……

31. What is the wall of your house made of?

| | | |
|---|---|---|
| 1. Mud/earth/cow dung | 2. Wood/bamboo | 3. burned mud bricks |
| 4. Cement/bricks | 5. Iron sheets | 6. Other ……. |

32. Where do you usually sell your product?

| | | |
|---|---|---|
| 1. IP members | 2. Village Market | 3. Ouahigouya Market |
| 4. In village to the village traders or to traders from neighbours villages | 5. In village to foreign traders | 6. directly on farm to traders |
| | | 7. In the other markets |

*33. Where have you been selling your products in the past two years?*

| | | |
|---|---|---|
| 1. Farm gate | 2. Village/local general market | 3. Butchery/super market |
| 4. Abattoir/processing | 5. livestock/crop market | 6. Other ……. |

**Questions on the indicators of Performance**

34. *Access to credit*

| ***1 = strongly disagree, 2 = disagree, 3 = indifferent, 4 = agree, 5 = strongly agree*** | **1** | **2** | **3** | **4** | **5** | **N/A** |
|---|---|---|---|---|---|---|
| a. I can borrow money when I am in need from financial services | | | | | | |
| b. Getting credit in the area has become easier in the past three years | | | | | | |

*35. Information access and exchange*

| ***1 = strongly disagree, 2 = disagree, 3 = indifferent, 4 = agree, 5 = strongly agree*** | **1** | **2** | **3** | **4** | **5** | **N/A** |
|---|---|---|---|---|---|---|
| a. Exchange of market information has improved in the past 2 years | | | | | | |
| b. Information on the market is easily accessible to value chain actors | | | | | | |

*36. Improved market access*

| ***1 = strongly disagree, 2 = disagree, 3 = indifferent, 4 = agree, 5 = strongly agree*** | **1** | **2** | **3** | **4** | **5** | **N/A** |
|---|---|---|---|---|---|---|
| a. There is a ready market for farm produce during harvesting seasons in my area | | | | | | |
| b. I am satisfied by the prices I get from my customers for my products | | | | | | |

*37. Access to inputs*

| ***1 = strongly disagree, 2 = disagree, 3 = indifferent, 4 = agree, 5 = strongly agree*** | **1** | **2** | **3** | **4** | **5** | **N/A** |
|---|---|---|---|---|---|---|
| c. I have easy access to crop and animal husbandry inputs | | | | | | |
| d. The prices I pay for crop and animal husbandry inputs are good value | | | | | | |

*38.* ***Increased crop and livestock production***

| ***1 = strongly disagree, 2 = disagree, 3 = indifferent, 4 = agree, 5 = strongly agree*** | **1** | **2** | **3** | **4** | **5** | **N/A** |
|---|---|---|---|---|---|---|
| e. My meat/milk production per animal is increasing | | | | | | |
| f. My crop production per surface unit is increasing | | | | | | |

*39. Increased soil and water management*

| ***1 = strongly disagree, 2 = disagree, 3 = indifferent, 4 = agree, 5 = strongly agree*** | **1** | **2** | **3** | **4** | **5** | **N/A** |
|---|---|---|---|---|---|---|
| g. More efforts are needed for improved soil and water management and supply | | | | | | |
| h. Some tension exist between breeders and crop producers for water and land use | | | | | | |

*40. Capacity building among value chain actors*

| ***1 = strongly disagree, 2 = disagree, 3 = indifferent, 4 = agree, 5 = strongly agree*** | **1** | **2** | **3** | **4** | **5** | **N/A** |
|---|---|---|---|---|---|---|
| i. My knowledge about my activity has improved in the past 2 years | | | | | | |
| j. Apart from the IP, I also participate in other group organizations to learn about innovations | | | | | | |

*41.* ***Coordination of activities among value chain actors***

| ***1 = strongly disagree, 2 = disagree, 3 = indifferent, 4 = agree, 5 = strongly agree*** | **1** | **2** | **3** | **4** | **5** | **N/A** |
|---|---|---|---|---|---|---|
| k. I am dependent of my value chain partners to plan my activities | | | | | | |
| l. I concert with my value chain partners to take concerted decisions | | | | | | |

**Questions on the respondent's activities within the VC-IP**

42. Type of activity within the IP

| | | | | | |
|---|---|---|---|---|---|
| 1 | Input supplier | 5 | Consumer | 9 | Financial organization |
| 2 | Producer | 6 | Research institute | 10 | GO (government organization) |
| 3 | Middleman | 7 | NGO | 11 | Other, please mention |
| 4 | processor | 8 | Funding agency | | …….. |

43. Participation in IP meetings

1. Never attended any meeting 2. Not so frequently attend the meetings

3. Often attend the meetings 4. Never missed any meeting

44. Where do you get information about the market?

| | | |
|---|---|---|
| 1. IP members | 2. Other friends in other places | 3. Extension agents |
| 4. The media | 5. Other social organizations | 6. Other, …….…… |

45. Where do you find information about animal health?

| | | |
|---|---|---|
| 1. IP members | 2. Other friends in other places | 3. Animal health centers |
| 4. The media | 5. Other social organizations | 6. Other, …….. |

46. Have you ever received any training on crop and livestock productions? ..Y.....

N.....

47. Did you get any advice/training on managing and marketing your products? Y.....

N.....

48. Have you ever shared market information with others? Y.....

N.....

49. If yes, what was the means of communication you usually use?

| | | |
|---|---|---|
| 1. Telephone | 2. Mass media | 3. Direct contact |
| 4. Internet | 5. Meetings | 6. Other, …….. |

*50. Focus on Joint Planning*

| ***1 = strongly disagree, 2 = disagree, 3 = indifferent, 4 = agree, 5 = strongly agree*** | **1** | **2** | **3** | **4** | **5** | **N/A** |
|---|---|---|---|---|---|---|
| a. Joint planning of activities with my value chain partners has improved in the past three years | | | | | | |
| b. Do you think that IP has had an impact on joint planning of your activities with your partners? | **Y** | | | | **N** | |

**More socioeconomic questions**

51. Do you own any one of the following possessions?

| Possessions du foyer | Oui /Non | Quantité | Possessions du foyer | Oui/Non | Quantité |
|---|---|---|---|---|---|
| 1. Telephone/mobile | | | 17. Spades | | |
| 2. Radio | | | 18. Generator | | |
| 3. Television | | | 19. cooking stove/gas | | |
| 4. Car/truck | | | 20. Sofa set | | |
| 5. Motorbike | | | 21. Tricycle | | |
| 6. Mosquito net | | | 22. Bowls for eating food | | |
| 7. Bike | | | 23. Cart | | |
| 8. Refrigerator | | | 24. Wheelbarrow | | |
| 9. Ventilator | | | 25. pick | | |
| 10. Water tanker | | | 26. watering | | |
| 11. Computer | | | 27. rake | | |
| 12. Internet | | | 28. Baramine | | |
| 13. Hoes | | | 29. rayonnair | | |
| 14. Sprayer pump | | | | | |
| 15. Sewing machine | | | | | |
| 16. Ploughs | | | | | |

52. What is your main/primary activity?

| | | |
|---|---|---|
| 1. Livestock keeping | 2. Crop farming | 3. Mixed crop and livestock farming |
| 4. Trading/merchant | 5. Processing | 6. Farm labour on other farm |
| 7. Domestic work in own home | 8. Not working at all | 9. Other …… |

53. What is the main source of income for the household? ……..

54. Please estimate your average income per year:.....

55. ***Focus on increased crop and livestock productions***

| ***1 = strongly disagree, 2 = disagree, 3 = indifferent, 4 = agree, 5 = strongly agree*** | **1** | **2** | **3** | **4** | **5** | **N/A** |
|---|---|---|---|---|---|---|
| a. Animal and pests diseases are still very frequent on the farm | | | | | | |
| b. Animal theft is still very frequent in the community | | | | | | |
| c. My crop and animal productions is increasing | | | | | | |
| d. My total quantity of products sell per year is increasing | | | | | | |
| e. I am interested by improved products | **N** | | | | **O** | |
| f. I find it difficult to obtain improved products | | | | | | |
| g. I lack knowledge on best practices of crop and livestock productions | | | | | | |
| h. I usually earn a profit from the sale of my products on market | | | | | | |
| i. I find it difficult to access agricultural equipment | | | | | | |
| j. I find it difficult to access storage equipment for my production | | | | | | |
| k. My production system has improved in the past 2 years | | | | | | |
| l. My total crop production has increased in the past 2 years | | | | | | |
| m. IP has had a positive impact on my productions activities | **Y** | | | | **N** | |

56. Would you like to give us any suggestion or comment regarding how this issue of IP can better be used to attain the development objectives they have been established for? …….....

……

…….....

.....

.....

***Thank you for your cooperation!***

57. Language the interview was conducted in

| 1. Language of the questionnaire | 2. Local language |
|---|---|

## Appendix 3: Questionnaire for individual survey with IP organisers/facilitators

### Objective of survey

I am a student research fellow working here on innovation platforms for my Master thesis.
We are doing a study to understand how your involvement in the innovation platform has changed your practices. I would like to ask you some questions about your activity and your relationships with your value chain suppliers and customers.

### Informed consent

If you accept to answer my questions, I want to make sure that you understand that all the information you give me will be kept anonymous. The information you will give me will not be associated to your name in any of our work or in our further interviews with other people working in this community.
If you want to know more about this research or if you have any comments or complaints, please call Hubert Somé (SNV Burkina).
If you want, we will inform you of the results of this study through a seminar.

### Respondent personal information

1. District name: …….
2. Name of community ……..
3. Respondent name ……. …….
4. Gender Male…… Female……..
5. Age …….
6. Marital status

| | | |
|---|---|---|
| 1. Single | 2. Married | 3. Divorced |
| 4. Widowed | 5. Other …… | |

7. Profession ……..……..
8. Main occupation …….

   Secondary occupation.....…….
9. Years of experience in the area: ……..
10. Role in the district/community: ……..……..
11. Phone no. ……
12. Highest level of education completed

| | | |
|---|---|---|
| 1. Never attended school | 2. Completed 4$^{th}$ grade | 3. Completed 8$^{th}$ grade |
| 4. Completed high school | 5. Certificate/diploma | 6. First degree and above |

**Information about the IPs**

13. Have you been working with IPs in the last two years? Yes …… No ……..

14. What is your role in the IPs?

| | | |
|---|---|---|
| 1. Chairperson/secretary | 2. Just member | 3. Facilitator/organizer |
| 4. Support organization | 5. Not even a member | 6. Other |

15. How many IPs are there in the community? ……

16. What kind of value chains are they organized on? ……

17. What are the criteria for joining the IPs in this district?

| | | | |
|---|---|---|---|
| 1. Wealth | 2. Gender | 3. Interest | 4. Type of activity |
| 5. Ethnicity | 6. Age | 7. Other …… | |

18. What are the current numbers of members of the IPs in this community?

19. Does this differ from the numbers at the establishments of the IPs? Yes….. No……

a. If yes, why does this difference occur? ……

20. How many of these numbers are women? ……

21. How often have you attended IP meetings?

22. What is the most common mode of decision making within the IP?

| | |
|---|---|
| 1. Simple 50% majority vote | 2. Members follow the decision of their leader, elder or representative |
| 3. 2/3 majority vote | 4. Members follow the advice of the IP facilitator |
| 5. Consensus among all members | 6. Consensus among different types of stakeholders represented in the IP |
| 7. Other, please specify:……. | |

23. What is the second most common mode of decision making within the IP?

| | |
|---|---|
| 1. Simple 50% majority vote | 2. Members follow the decision of their leader, elder or representative |
| 3. 2/3 majority vote | 4. Members follow the advice of the IP facilitator |
| 5. Consensus among all members | 6. Other, please specify:……... |
| 7. Consensus among different types of stakeholders represented in the IP | 8. No other mode of decision making |

24. Do IP Members gather in smaller separate groups or committees to focus on specific issues before reporting to the other IP members for decision making?

Yes…….. No…….. Don't know……..

25. What are the sources of funding available to allow the IP to function (several answers possible)?

| | |
|---|---|
| 1. Member registration fees | 2. Grant from NGO or international development project |
| 3. Other voluntary financial contributions from members | 4. Tax or levee on sales of members |
| 5. Grant from government or public body | 6. Other, please specify……. |

26. Does the IP pay any staff to help manage it? Yes…….. No……

27. If yes, how many staff are receiving a salary from the IP? ……

28. Is there a regulatory framework recognizing multi-stakeholder associations like IPs in your country? Yes..... No..... Don't know.....

29. Does the IP you are facilitating have explicit rules, regulations or by-laws to govern it? Yes..... No..... Don't know.....

**Support facilities provided to the IPs**

30. In the last three years, how many times did you provide advice/training to IP members or participated in IP meetings? .....
…….

31. What subjects were the advices/trainings on? .....
……
……

32. How was the advice/training delivered (e.g. during IP meetings, direct visit, training course)?

**Focus on crops /Livestock productions and joint planning**

**33.** According to, what are the main challenges faced by crops and livestock in the community?……

34. What kind of improvements crop and livestock productions have known the last three years in the community?

35. Which of these improvements can be linked to the existence of innovation platforms? What is the relationship between IP and these improvements?.....

36. Do you think the farmers prefer to work and plan their activities alone or they plan their activities in consultation with their partners in the value chain? And why?.....

37. What is the current state of coordination between IP members? Does IP members exchange information on their ongoing activities with their partners in the value chain? If so, how this coordination took place?

38. What is about freedom of expression within IP

39. To what extent do you agree that improving crop and livestock productions is closely linked to the existence of IP in this community?

    1) strongly disagree 2) disagree 3)indifferent 4) agree 5) strongly agree

40. To what extent do you agree that improving crop and livestock productions is closely linked to joint planning of activities between IP members along the value chains?

    1) strongly disagree 2) disagree 3)indifferent 4) agree 5) strongly agree

41. Would you like to give us any suggestion or comment regarding how this issue of IP can better be used to attain the development objectives they have been established for?.....

***Thank you for your cooperation!***

42. Language the interview was conducted in

| 1. Language of the questionnaire | 2. Local language |
|---|---|

## Appendix 4: Questionnaire for individual survey with key informants of IP members

### Objective of survey

I am a student research fellow working here on innovation platforms for my Master thesis.
We are doing a study to understand how your involvement in the innovation platform has changed your practices. I would like to ask you some questions about your activity and your relationships with your value chain suppliers and customers.

### Informed consent

If you accept to answer my questions, I want to make sure that you understand that all the information you give me will be kept anonymous. The information you will give me will not be associated to your name in any of our work or in our further interviews with other people working in this community.
If you want to know more about this research or if you have any comments or complaints, please call Hubert Somé (SNV Burkina).
If you want, we will inform you of the results of this study through a seminar.

### Respondent personal information

1. District name: …….
2. Name of community ……..
3. Respondent name ……. …….
4. Gender Male…… Female……..
5. Age …….
6. Marital status

| | | |
|---|---|---|
| 6. Single | 7. Married | 8. Divorced |
| 9. Widowed | 10. Other …… | |

7. Profession ……..……..
8. Main occupation …….

   Secondary occupation.....…….
9. Years of experience in the area: ……..
10. Role in the district/community: ……..……..
11. Phone no. …….
12. Highest level of education completed

| | | |
|---|---|---|
| 7. Never attended school | 8. Completed 4th grade | 9. Completed 8th grade |
| 10. Completed high school | 11. Certificate/diploma | 12. First degree and above |

**Socioeconomic information**

13. Do you know what a innovation platform? Yes ..... No .....

    If so what does this mean for you? .....

14. How often have you attended IP meetings?

| | |
|---|---|
| 1. Never attended any meeting | 2. Not so frequently attend the meetings |
| 3. Often attend the meetings | 4. Never missed any meeting |

15. What is your special role within the IP?

| | | |
|---|---|---|
| 7. Chairperson/secretary | 8. Just member | 9. Facilitator/organizer |
| 10. Support organization | 11. Not even a member | 12. Other |

16. What activity or activities do you undertake within the value chain or IP?

| | | | | | |
|---|---|---|---|---|---|
| 1 | Input supplier | 5 | Consumer | 9 | Financial organization |
| 2 | Producer | 6 | Research institute | 10 | GO (government organization) |
| 3 | Middleman | 7 | NGO | 11 | Other, please mention …… |

17. Do you think they are helpful to the community? Yes ……..… No ……..… Don't know ……..

    If so, in what ways? ……...

**Opportunities, challenges and constraints for market access development**

18. What are the main challenges in these value chains?.....
19. What are the challenges and opportunities to improve market access for stakeholders of the value chain?.....
20. How do you think the problems could be solved given these opportunities?
21. What strategies were taken to solve challenges of market access? …….
22. Were those strategies successful?

**On the success of the innovation platform project**

23. Do you agree that IPs are at all important?
    1) strongly disagree 2) disagree 3) indifferent 4) agree 5) strongly agree
24. Do you also work with other social organizations or groups other than IP?
    Yes……. No…….
25. If yes, what differences did you observe in the workings of IPs and other groups? …….

**Focus on crops /Livestock productions and joint planning**

**26.** According to, what are the main challenges faced by crops and livestock in the community?……

27. What kind of improvements crop and livestock productions have known the last three years in the community?

28. Which of these improvements can be linked to the existence of innovation platforms? What is the relationship between IP and these improvements?.....

29. Do you think the farmers prefer to work and plan their activities alone or they plan their activities in consultation with their partners in the value chain? And why?.....

30. What is the current state of coordination between IP members? Does IP members exchange information on their ongoing activities with their partners in the value chain? If so, how this coordination took place?

31. What is about freedom of expression within IP?.....

32. How IP helped you to improve your knowledge in your activities?.....

33. Have you received training through IP? If yes, how many trainings in total (and the topics of the training)? What did you learn through this training? .....

34. Would you like to give us any suggestion or comment regarding how this issue of IP can better be used to attain the development objectives they have been established for?

***Thank you for your cooperation!***

35. Language the interview was conducted in

| | |
|---|---|
| 1. Language of the questionnaire | 2. Local language |

## Appendix 5: Statistique descriptive of some important variables

| Variables | Number of respondents | Likert Scale Results | | | | | |
|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | Likert scale Mean |
| animal and plant diseases still frequent in the farms | 57 | 0 | 1 | 2 | 36 | 18 | **4.25** |
| animal theft still frequent in the farms | 57 | 13 | 13 | 3 | 17 | 11 | **3** |
| my animal and vegetal production is increasing | 57 | 0 | 3 | 4 | 35 | 15 | **4.09** |
| my total quantity of products sell per year is increasing | 56 | 0 | 7 | 3 | 40 | 6 | **3.80** |
| I find that it is easy to access to improved products | 56 | 18 | 22 | 2 | 13 | 1 | **2.23** |
| I have a good knowledge on good practices of animal and vegetal productions | 57 | 1 | 44 | 11 | 1 | 0 | **2.21** |
| My knowledge about my activity has improved in the past 2 years | 57 | 0 | 2 | 0 | 36 | 19 | 4.26 |
| In general i get benefice from selling my products in the market | 56 | 0 | 0 | 2 | 45 | 9 | **4.13** |
| I have easy access to agricultural equipments | 57 | 35 | 16 | 0 | 2 | 4 | **1.67** |
| I have easy access to storage equipments | 57 | 5 | 18 | 2 | 32 | 0 | **3.07** |
| There improving of my production system this last 2years | 57 | 0 | 1 | 1 | 37 | 18 | **4.26** |
| My total production is increasing this last 2 years | 57 | 0 | 1 | 2 | 30 | 24 | **4.35** |
| IP had a positive impact on my production activities | 57 | 0 | 0 | 4 | 9 | 44 | **4.70** |
| I have easy access to crop and animal husbandry inputs | 57 | 19 | 22 | 4 | 11 | 1 | **2.18** |
| The prices I pay for crop and animal husbandry inputs are good value | 57 | 5 | 24 | 9 | 19 | 0 | 2.74 |
| My meat/milk production per animal is increasing | 57 | 0 | 5 | 4 | 42 | 6 | **3.86** |
| My crop production per surface unit is increasing | 56 | 1 | 5 | 9 | 32 | 9 | **3.77** |
| I exchange information with my value chain partners about my on-going activities | 57 | 1 | 10 | 1 | 37 | 8 | **3.72** |
| My value chain partners exchange about their on-going activities with me | 57 | 1 | 10 | 2 | 35 | 9 | **3.72** |
| I plan my activities according to the activities of my value chain partner | 57 | 0 | 20 | 2 | 29 | 6 | **3.37** |
| I can express my views freely in exchanges with my value chain partners | 57 | 0 | 0 | 1 | 15 | 41 | **4.70** |
| My value chain partners and I plan activities together according to our production | 57 | 0 | 33 | 6 | 10 | 8 | **2.88** |
| My viewpoint are taken into account by my value chain partners when they plan | 52 | 0 | 0 | 11 | 33 | 8 | **3.94** |
| I am dependent of my value chain partners to plan my activities | 57 | 10 | 29 | 4 | 11 | 3 | **2.44** |
| I concert with my value chain partners to take concerted decisions | 57 | 2 | 26 | 6 | 16 | 7 | **3** |
| The concerted planification of activities with my value chain partners has improved over the last 3 years | 37 | 0 | 0 | 0 | 32 | 5 | **4.14** |
| The IP had an impact on the planning of my activities with my partners | 57 | 0 | 3 | 0 | 40 | 14 | **4.14** |

**For likert scale results:** 1 = strongly disagree, 2 = disagree, 3 = indifferent, 4 = agree, 5 = strongly agree

## Appendix 6: Some photos taken during focus group discussions