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Curricula and Farming Trainings in Senegal: Extension Workers' Skills and needs in Farming Risks Management

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Abstract

In Senegal, the farming technicians who were in the educational system in place in the 1960s did not allow to ensure food security. Today, the orientation of public policies has favored alternative agricultural trainings. In the context of global changes, these trainings have to integrate the development of skills in farming risks assessment and management. How might such an integration be brought about? The objective of this study is to determine the extension workers training needs in farming risks management, in order to contribute to the improvement of a farming skills development system. The methodology, combining quantitative and qualitative data, allowed to interview 25 farming advisors and to analyze the models of three higher training structures. Advisors, who consider farming risks management as a trendy "*fashionable concept"* coined by the intervening agencies**,** have a deficit in skills on the subject. They do not clearly integrate risks management in their function as farming development advisors. Training needs identified seem important and are of three types (basic skills, cross-curricular competencies and specific skills). Models do not clearly integrate these skills, even though some modules allow tackling them. Needs identified, militate in favor of an evolution of curricula and farming training approaches. The success of such an evolution may depend on the reorganization of the system of farming skills development in Senegal. Undoubtedly, any training development activity in farming risks management has to be integrated into a sustainable interdisciplinary strategy that takes into account the mitigating, transfer and adapting measures. The perception of farming advisors on farming risks management does not militate in favor of isolated and offhanded actions.

Keywords: farming advisor, risks, mitigation, transfer and adaptation needs, curricula, skills development

Introduction

Senegal is a Sahelian country which is among the most vulnerable ones on the food plan. Its agriculture fails to ensure food security and poverty is a reality in rural areas. Again this year, the Government was obliged to mobilize billions of CFA francs to help the rural world bridge a very long period of food shortage. As a matter of fact, the farming sector performance is very unstable because of its high exposure to risks. Over the past 30 years, Senegal underwent numerous shocks in connection with the availability and accessibility of foodstuffs especially in the rural world. These shocks also affect adversely the household incomes, the farming sector performance, the State budget balance and the country's economic growth rate. (Ndiaye, 2013). In the years 2000, farming re-launching through special programs (maize, cassava, sesame, etc.), the rice self-sufficiency program and the GOANA[2] did not reach their goals. Beyond the constraints to agricultural development, several farming risks were identified as accountable for the mixed results. Those risks can be classified in three types (World Bank, 2013):

-Risks affecting the output (drought, locust invasions, livestock diseases and parasites, crops pests and diseases, floods, windstorms and bushfires, herd rambling)

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- Risks related to the market (food price volatility, sharp rise in seasonal prices and fluctuations in the output or prices, from year to year)
- Risks related to the socio-political context (conflicts of access to natural resources, civil war, rebellion, displacement of populations).

At this level, the question is to know whether agricultural and rural development agents possess the required skills to help in the assessment and management of these risks. In the 1960s, three types of training schools for these agents were set up in Senegal to train technical agents, work study engineers and design engineers. These technicians could serve as farming advisors or administrative agents depending on their assignments. Today, the orientation of public policies and the adoption of the LMD system have promoted new farming trainings in other public universities. This multiplication of trainings requires an adaptation to the job market. How should such an adaptation be done? In theory, it would be carried out through an accurate determination of the skills required for the performance of farming extension workers duties, and their integration in the students training curricula. It is thus a matter of identifying the training needs in farming risks assessment and management. So what are the skills required for farming risks management in Senegal? What are the farming advisors 'training needs? To answer these questions the following objectives were identified.

Objectives

This study aims to contribute to the determination of farming advisors' training needs in risks assessment and management, in the River Valley area. More specifically, it seeks to:

- identify the main farming risks in the River Valley area,
-spot, in training curricula, modules regarding risks management,
-determine skills regarding risks assessment and management.

To do this, quantitative and qualitative data were associated.

Methodology

This study is based on a survey with ANCAR agents in the agro-ecological valley area of the river Senegal. Data were collected in March/April 2014 in that area which encompasses the administrative regions of Matam and Saint Louis. The investigating phase was preceded by three focus groups with the farming advisors during a regional meeting. Then, the questionnaires the filling of which lasts about 30 mn, were distributed to the 35 agents in the area. The interviewees were requested to take them home, fill them and send them back by mail. The answers were codified and introduced in EXCEL software for operation and analysis. With the small size of the sample, generalizing may be difficult, but all farming advisors in the area were interviewed. Besides, the findings which point to important issues regarding risks management skills may prevail. Discussions were held with the regional director and his assistants who felt that the survey was very useful. Furthermore, the training models of three higher training structures (the Agricultural faculty, the Higher National School of Agronomy and the Higher Institute of Agricultural and Rural Training) were analyzed. Exploiting the data allowed to obtain the following results.

Results

The reported results relate to research objectives: a) farming risks in the River Valley b) risks management modules in training curricula and c) advisors' need regarding risks management.

1. Farming risks in the River Valley

1.1 Demographic Characteristics of Advisors

With regard to the demographic characteristics, we focussed our interest on four areas: a) sex of respondents, b) level of education, c) years of service in farming advising and d) in-service trainings over the last two years. Of the 25 respondents, twenty- three (92.0%) are male while four (8 %) were women. The distribution of participants according to their level of education is as follows: seven (28%) had a master's degree, two (8%) a bachelor degree, and nine (36%) the technical baccalaureate level. Fourteen advisors (56%) were in office for six years or more. Eleven (44%) made 6 to 10 years. Twenty-three (92%) asserted having attended recycling sessions in farming production techniques. None attended a training session in farming risks management or communication.

1.2 Farming risks in the River Valley

In general, all agents identify farming biophysical risks (drought, granivores, and compliance with the farming calendar, crops pests and diseases, floods and animals ramblng in the fields) as actual in the area. Only 2 (8%) advisors understand and integrate the risks associated with prices (farming inputs and produce) while none of them do so with risks associated with agricultural policies (system of subsidies, food security priorities, crop insurance, agricultural credits, incentive measures for risks management); and yet these two risks seem to us extremely important. Socio-political risks are declared non-existent in the area.

1.3 Perceptions, Strategies and Risks Management Tools by Farming Advisors

Notions of vulnerability, resilience, danger and disaster are vague in the head of the agents. During the focus groups, two advisors agreed to embark on the definition of these concepts. The others considered that these were concepts for researchers and other interveners. For them, the changes of concept are very frequent in the field of intervention for agricultural development: ' *each stakeholder comes with his own concepts to say the same thing as his predecessors* '. This perception of advisers shows that farming risks assessment and management are not yet integrated into a strategy of agricultural development and production control. Besides, 13 advisers (52%) declare taking into account farming risks in their advising strategies. They particularly act at two levels: compliance with the farming calendar and heed to crop pests and diseases. In addition, 3 agents (12%) identified anticipated supply of inputs as part of farming risks management. Transfer measures (crop insurance, livestock insurance) were not quoted aselements of risks management. Others farming risks are not taken into account in advising strategies. Curiously these are some biophysical risks (drought, granivores, and floods) on the one hand, and on the other, policy and farming produce prices related risks. For advising tools regarding risks management, the new technologies of information and communication (internet, GIS and Geomatics) are not used. The last two are unknown to more than 92% of advisors. Social media (NICT) are tools that extension workers may use to bring them within reach of farmers. The study found that the majority of extension workers had access to social media. Eighteen advisors (72%) had cell phones; sixteen (64%) had e-mail accounts; 12 (48%) had laptops; and ten (40%) had access to desktop computers. However, they used these for personal purposes, not as tools to reach farmers. Only, the mobile phone is used by all advisors to reach farmers. Concerning farming risks sustainable management tools, early whistle blowing and contingency plans are totally ignored by the advisors, of whom, at least 17 (68%) are unaware of the terminology. These relationships between farming advisors and farming risks may be explained through the training curricula.

2. Risks Management Modules in Training Curricula in Senegal

In Senegal, there is no basic training in farming extension work in universities. There are three farming technical degrees: associate degree, bachelor and Master. Graduates in these courses may become farming advisors. A priori, there is neither farming advisor training nor farming risks management specialist. Analysis of farming training curricula shows straightaway that Senegalese graduates are specialists in farm production. Training models modules are basically oriented towards production techniques. Generally, the scientific and biological bases establish the basic constituent elements. Then, the technical bases (supply of nutriments, elements of productivity and production technique) follow. Finally, what is noticed are production improving contents, health management and production analysis. Beside these core modules, additional elements may be identified in relation to computing, economy, sociology, law, english and communication. In the analysis of training models, no risks management module stands out clearly. Nevertheless, certain elements may allow students to acquire skills in farming risks management (in table 1).

Table1: Risk Management Skills in Modules

Associate degree (Agroecology UFR S2ATA)	Bachelor (ISFAR)	Master (ENSA)
Climatology	Bioclimatology	Bioclimatology
Plant Bio-aggressors Animal Bio-aggressors Control methods Weed Science	Plant pathology Agricultural Entomology Crop protection Weed Science Control methods	Plant pathology Agricultural Entomology Crop protection Weed Science Plant protection strategies
Informatics and ICT Databases		Informatics and ICT
Economy Rural sociology	Economy Rural sociology	Economy Sociology Planning
Principles of the extension, education and Communication	Council agriculture and Rural	Agricultural extension
	Land arrangements Crop rotations/Rotations Cultural calendar Participatory diagnosis Production system	

In addition to these elements, field training and graduation memoirs are also periods during which students may acquire skills regarding farming risks management. Basically, farming trainings and curricula are not oriented towards farming risks assessment and management, even though some modules allow to take into account some skills in connection with biophysical and socio-economic risks. Identifying field agent's needs could contribute to the correction of this orientation.

3. Advisors needs for Training in Risks Management

3.1 Farming Council and Farming Risks Management

With global changes, farming risks management has become an important element in agricultural and rural development, particularly in Africa where food security is far from being achieved. However, to better manage these risks and develop agriculture, the training of farming advisors is important. Table 2 shows however that these advisors have virtually no training in farming risks management.

Table 2: Farming Council and Farming Risks Management

Advisors vision on farming risks management	Agree %
I have been trained for the implementation of farming development	**20 (80%)**
Extension workers require training in farming risks management	20 (80%)
Extension workers are involved in farming risks management planning	18 (72%)
Assessment and management of farming risks are complex	17 (68%)
extension workers do not have the training to deal with farming risks management process complexity	15 (60%)
Extension workers are involved in the assessment of farming risks	13 (52%)
I was trained to the implementation of the farming risks management policies	**7 (28%)**
Understanding the theory of farming risks is essential for farming advisors	7 (28%)
Understanding farming risks management policies is essential for advisors	7 (28%)
Understanding risks management practices is essential for advisors	3 (12%)

The overwhelming majority think that advisors are farming development agents (80%) while disconnecting at the same time this function with that of risks management (28%). The importance of needs for training in risks management (80%) appears inconsistent with the answers on their understandings of the theory, policies and practices regarding risks management which obtained respectively 28%, 28% and 12% of the responses. Without denying this expression of need, it should be noted that the will of advisors to participate in any training seminar is a constant (Ndiaye, 2013b). Thus, any skills development activity regarding farming risks management has to be the object of a well- structured strategy to make potential investments produce maximum profit.

3.2 Necessity of Communication in Agricultural Risk Management

Concerning communication, Rogers in his book *Communication of Innovations: A Cross - Cultural Approach* (Rogers and Schuster, 1971) shows how extension workers may use communication as an effective tool for interacting with farmers, especially small farmers. For him, extension workers tend to be oriented towards city life, while small farmers are oriented towards country life. He thinks that to be effective, advising extension workers need good communication skills (Agunga, 2014). In our study, it also appears that advisors need communication training when a large part of their curricula focuses on farming techniques.

Table 3: Communication and Risks Management (sources: Agunga, 2014)

Advisors views on communication and farming risks management	Agree %
Development extension workers need communication training	21 (84%
Communication is necessary for coordination	20 (80%)
Communication is necessary for integration	20 (80%)
Communication is necessary to establish links	20 (80%)
Communication brings together development partners	20 (80%)
Communication is essential for decentralization	19 (76%)

As shown in table 3, the majority (84%) expressed a need for training in communication. Furthermore, 80% of them agreed that communication is necessary for: a) coordination, b) integration, c) strengthening of links and partnerships. Otherwise, only 4 advisors (16%) put their communication function in the service of risks management.

3.3 Farming Risks Management Skills

In farming risks management, a number of skills are required. In the River Valley, farming advisors recognize that they have very little expertise in some of these skills.

Table 4: Advisors Skills in Farming Risks Management

Skills listing	Agree %
For me, farming diversification is important for risks management	23 (95%)
Iknow how to measure my responsibility in farming risks management	15 (60%)
I know how to prioritize risks	6 (24%)
I know how to assess risks and determine the challenge they raise	5 (20%)
I can estimate the relationships between risks	2 (8%)
I am involved in the drawing up of incentive measures for risks management	2 (8%)
Farming insurance is decisive in risks management	2 (8%)
I can help producers establish a risk priority order based on their information and behavior	2 (8%)
I have skills in modeling technology	1 (4%)
I know how to read images of tele detection images and GIS	1 (4%)
I know how to do crisis mapping in my area	1 (4%)
I know what is an early warning system	0 (0%)
I know how to set up a contingency plan	0 (0%)

Table 4 shows that advisors, while conferring on themselves (60%) skills in the hierarchical organization of risks, have significant gaps in the field. About risks management, farming diversification is recognized as an important instrument by 95% of advisors.

Conclusion and Recommendations

Farming risks (biophysical, socio-economic and farming policies related) are important in the Valley and farming advisors should play an important role in farming risks management. But, they do not fundamentally and clearly integrate farming risks in their mission. They rather consider this area as a trendy «*fashionable concept"* coined by the intervening agencies. They develop few skills in that field. And for a good reason, the basic training of these technicians does not focus on farming risks management or communication but on farming output. Farming advisors strategies did not integrate farming risks as a full element.

The analysis of advisors needs regarding farming risks management shows that these skills could be organized around four main subjects:

- **basic skills:** notions of vulnerability, risk, danger, disaster and resilience; prioritization and interdependence of risks; risks assessment; technologies for surveillance and warning, early warning systems, contingency plan;
- **specific skills 1 (biophysical risks)**: climatology (drought and floods), plant protection (granivores, pests and diseases), production system (diversification, compliance with the farming calendar and animals ramblings);
- **specific skills 2 (related to farming policies and rural socio-economy)**:inputs and farming produce prices, banks and farming capital, farm subsidy system, credits and farming insurance, incentive measures for risks management;
- **Cross-curricula competencies:** response coordination, risks management and accountability, information on risks and actors behavior, communication for development and on risks, mapping, GIS and geomatics;

This is not simply a matter of including these modules in curricula models. It is necessary to put oneself in a perspective to introduce skills in farming risks management. To that effect, it is necessary to resort to the tryptic (Anton, j., S. Kimura and R. Martini; 2011) :

- Mitigating measures (actions carried out to reduce the probability of risk occurrence, exposure to these risks and/or the potential loss that it might induce),
- Transfer measure (transfer of the risk to a party willing to accept it for a commission or a bonus),
- Andadaptating measure (activities which aim at helping bear losses), in order to draw up a list of possible interventions.

The implementation of this tryptic requires a multi and interdisciplinary approach that appeals to agronomic, geographic, computer, economic, sociological, communication sciences, etc... Generally, these disciplines are included in the training curricula of the Faculty, except that they are not put in the service of risks management, but of farming output as part of an approach by content which considers risks management as incidental. Except that, in the context of global changes and the state of food security in Senegal, the issue of risks management skills cannot be dealt with that way. Training in farming risks management has to be a clear orientation and be made as part of an approach by skills on the issue. Such an approach could be implemented through two complementary options. The first is to offer modules of farming risks management to propose to extension workers. This option must be object of a well -structured strategy to make potential investments produce maximum profits. As a matter of fact, the perception of extension workers on farming risks management does not militate in favor of isolated and offhanded actions. The second option would be to develop new curricula for extension workers. This could be done either by introducing farming risks management modules into existing curricula, or by implementing specific trainings regarding farming risks management. Specific trainings could require a comprehensive modification of the system of farming trainings in Senegal. Each of these two options (modules for field agents and new curricula) participate in the reconstruction of the skills development system. This raises the question of whether farming risks assessment and management could be a scientific discipline, on its own. Basically, the success of farming risks management integration to the farming system in Senegal has to be made through a well -structured sustainable strategy.

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