Ways to Expand the Animal Welfare Component in the Extension System in Senegal: A Case Study of Thies and Bambey

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Abstract

In Senegal, in recent years the rural sector has undergone major reforms which are partly due to macroeconomic policy reforms adopted by the Senegalese government. Therefore, all the actors of economic and social development have a common concern and share in promoting rural agriculture (Bernard et al., 2008). Changes observed in the agricultural and rural sector reflect the will of the actors to have a productive, competitive, and sustainable agriculture system in order to ensure food security (International Monetary Fund, 2011). The purpose of the study is to develop a set of recommendations to improve the educational program planning and teaching skills of educators in the extension system by focusing on extension agents for improved animal welfare education teaching farmers and cart owners animal welfare practices for proper care of working animals. The extension agents and teachers involved in the animal husbandry and animal extension system in Thies and Bambey served as participants in this study. This descriptive qualitative study connected qualitative data derived from participant interviews, qualitative document analysis, observations of an educational program planning professional development program for state agents and university faculty members in Diourbel and Thies regions, as well as a final focus group to allow participants clarification of preliminary themes found in the data. The findings revealed 11 themes: characteristics of the participants, job expectation and responsibilities, institutional and organizational factors, capacity building and professional development plans, diagnostics of the extension system, regulations and legislations, limited sources of information, limited knowledge and skills technologies, recommendations for utilizing student-centered teaching practices, standard welfare for animal husbandry, recommendation for
acceptance and improvement standard animal welfare related to the four research questions which addressed the topics of challenging current teaching methods used in the extension system for other owners of animal species in the animal extension programs, the use of student-centered teaching practices in extension education and university instruction, and the level assistance given to farmers in order to ensure accepted standards of animal welfare working animal and other animal species in the animal husbandry system.
Abstract

In Senegal, in recent years the rural sector has undergone major reforms which are partly due to macroeconomic policy reforms adopted by the Senegalese government. Therefore, all the actors of economic and social development have a common concern and share in promoting rural agriculture (Bernard et al., 2008). Changes observed in the agricultural and rural sector reflect the will of the actors to have a productive, competitive, and sustainable agriculture system in order to ensure food security (International Monetary Fund, 2011). The purpose of the study is to develop a set of recommendations to improve the educational program planning and teaching skills of educators in the extension system by focusing on teaching farmers and cart owners animal welfare practices for proper care of working animals. The extension agents and teachers involved in the animal husbandry and animal extension system in Thies and Bambey served as participants in this study. The methodology used for this descriptive qualitative study were interviews, qualitative document analysis, observations of an educational and professional development program planning for state agents and university faculty members in Diourbel and Thies regions, as well as a final focus group to allow participants clarification of preliminary themes found in the data. The data collected from participants were connected to the different used qualitative methods to gather data. The 11 themes found in this study were the characteristics of the participants, job expectation and responsibilities, institutional and organizational factors, capacity building and professional development plans, diagnostics of the extension system, regulations and legislations, limited sources of information, limited knowledge and skills technologies, recommendations for utilizing student-centered teaching practices, standard welfare for animal husbandry, recommendation for acceptance and improvement standard animal welfare related to the four research questions which addressed the topics of challenging current teaching methods used in the extension system.
for other owners of animal species in the animal extension programs, the use of student-centered teaching practices in extension education and university instruction, and the level assistance given to farmers in order to ensure accepted standards of animal welfare working animal and other animal species in the animal husbandry system.
Dedications

Praise be to Allah, the merciful; peace and blessings upon his Prophet Muhammad.

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To my late father who surrounded me with the guidance, love and affection. I will remember you, ALWAYS, because with the bevel of love, you have engraved in my heart memories that will be eternal.
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Hokie for life, Hokie forever!
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 Abbreviations

AAHC: Agricultural Animal Health Care
CFA: West African CFA franc
CONFINTEA: International Conference on Adult Education
GDP: Gross Domestic Product
MEF: Ministère de l’Economie et des Finances
MEL: Ministère de l’Economie et des Finances
NAD: National agricultural directory of South Africa
NGOs: Non-Government Organizations
PAPEL:
RGPHAE: General Census of Population and Housing, Agriculture and Animal Husbandry
SODEVA: Société de Développement et de Vulgarisation Agricole
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Chapter 1: INTRODUCTION

Located on the western side of the African continent, apart from the far south, much of Senegal lies in the drought prone Sahel area, with poor soil and erratic rainfall (Nation, 2010; Hassan, 2010). In Senegal, in recent years the rural sector has undergone major reforms which are partly due to macroeconomic policy reforms adopted by the Senegalese government. These reforms have resulted in restructuring of agricultural and rural support services and have also helped to clarify the major strategic sectoral guidelines in harmony with national economic policy. These guidelines have been defined, specified and operationalized in reference to the sectoral rural development policy (International Monetary Fund, 2013). Therefore, all the actors of economic and social development have a common concern and share in promoting rural agriculture (Bernard et al., 2008). Indeed, this sector occupies an important place in the economy because it contributes to 20% of the GDP and employs 65-70% of the active rural population (Bravo-Ureta, & Thiam, 2003). This heavy dependence on agriculture illustrates its importance and weight in the Senegalese economy. Changes observed in the agricultural and rural sector reflect the will of the actors to have a productive, competitive, and sustainable agriculture system in order to ensure food security (International Monetary Fund, 2011). The activities of this sector revolve primarily around crop production, forestry, fisheries and livestock production. The rural agricultural sector abounds with enormous potential but the production performance are heterogeneous, unstable and generally inadequate in view of the issues of security and food self-sufficiency (Duggan & Naarajaran, 2015; Delgado et al., 2010; Roa, 2007). This poor performance is usually related to technical, commercial and organizational issues for actors involved in agricultural and rural development including the state services, the decentralized services, advisory support, financing institutions, NGOs, local authorities, producer
organizations and development partners (Knuth & Knierim, 2013; Jere, 2007; Povellato & Scorzelli, 2006). Further, the professional capacity of extension services and extension agents have decreased due to financial restraints, as well as decreases in technical, social and training opportunities (Okorley, 2007; Knuth & Knierim, 2013).

**Background to the problem**

The Senegalese agriculture system is still characterized as family and peasant based and largely reliant on animal energy (Lhoste et al., 2010a; Lhoste et al., 2010b; Pearson, 2004). Several publications emphasize the importance of working animals in developing countries, because of the roles that they play in the society, primarily in rural areas (Fuller & Aye, 2012; Rahman & Rahman, 2009; Pearson, 2004). The working animal energy is used to totally cover the energy needs for agricultural production of family farmers (Lhoste et al., 2010a; Lhoste et al., 2010b). Senegal has a large horse herd whose number was 523,095 head in 2014 (MEF, 2014). They occupy a prominent place in the Senegalese economy in general and particularly in agro-pastoral system based on family farming (MEL, 2014). The main working animals used by farm households are donkeys (45.3%), horses (37.9%) and cattle (16.7 %) (RGPHAE, 2013). As in many parts of the African continent, animal power still makes up an essential part of daily life. Thereby, working animals are used to transport locals, tourists and goods through the busy streets in towns and rural areas, ploughing fields, water pumps, weeding, sowing, and helping with the harvest and transportation of crops and residues (Simalenga and Joubert, 1997, Macleod, 1999, Starkey, 2000, Pearson & Kreczek, 2006; Swan, 2006). Also important is the production of manure that is spread in the fields as organic fertilizer for the regeneration of the degraded or poor soils. Therefore, the success of efforts to ameliorate the difficult production conditions, increase the farm productivity and improve the integration of working animals to the
rural production systems are linked to the agricultural modernization and the reform of land rights and agrarian systems.

Working animals are involved in almost all sectors of socio-economic activities, but mainly in rural areas. The evidence that links working animals to socio-economic activities in rural areas support promoting interest, motivation and commitment to animal welfare (Pritchard, 2005). As we know the use of working animals still continues and will continue for the foreseeable future in rural areas of developing countries, and services involved in the introduction of new technics and farm practices for rural producers are challenged to analyze in deep the evolution of the progress for a better appreciation of welfare for animal traction. Working and living conditions for working animals such as donkeys and horses are very fragile and require special attention not only from producers, users and owners, but also from state authorities, extension agents, Non-Governmental Organizations (NGO) and international funders (Smith & Pearson 2003, Kay et al., 2004, Pritchard et al., 2005, Pearson & Krecek 2006).

Knowing the importance of the functions of working animals in the production systems, it is important to analyze their current situations and take in account the need for improvement by focusing on the living and working conditions, and treatment of these animals (Fall et al., 2003). As a result, the extension services have an important role to play in promoting the working animal conditions of life.

Human-animal relationship has a long and varied history, and generally depends on human needs (Mills, 2010, Demello, 2010, Hurn, 2012). The first scientific publications on animal welfare assumed that an animal that was not showing a physiological stress response would have good welfare and an animal that was showing a significant stress response would have poor welfare (Bareham, 1972; Bryant, 1972; Freeman, 1978), but these assumptions were
subsequently shown not always to hold true. The welfare of the working animals in developing
countries is poor and many suffer from sickness and disease as a result of working for prolonged
periods in a challenging climate, and without consideration about the time or the rest of the
animal (Swann, 2006; Pritchard et al., 2005). Therefore, several problems are observed among
the working animal population such as issues with foot care, proper feeding practices and
problems associated with scarcity of fodder (Lhoste et al., 2010a), and disease management that
are the result of their owners low level of knowledge about animal welfare as well as their lack
of animal husbandry skills (Stringer et al., 2009). For example, horses and donkeys can have a
common foot problem caused by traditional shoeing practices where local farriers are making
shoes from reinforced steel and trimming the foot to fit the shoe (Sells et al., 2010, Pearson et al.,
2003). Additionally, health problems associated with recurrent diseases such as strangles, colic,
laminitis, African Horse Sickness (Horse Pest) have been recorded in northern and central
regions. Moreover, generally the transportation carts in Senegal are of an average standard size
however, and the harness used was often in disrepair and caused severe injuries. As a result,
thousands of working animals in transportation system in Senegal are suffering, every day as a
result of mistreatment because their owners simply do not have access to the skills or the
understanding required to care for them properly. In addition, there is a lack of knowledge about
caring for working animals because owners and cart-drivers often seek only to earn income by
working with them without worrying about the rest of the animal (Lhoste et al., 2010a; Starkey,
1986, 1992 and 2000; Pingali et al., 1987. This situation is the result of a lack of knowledge,
deficit of improved organizations and being part of organization for the owners (AAHC, 1999;
Patrushev & Patrusev, 1939), because they never receive an educational program from the
animal husbandry extension system.
In Senegal, the extension system services were used working animals before 1930 (Berrett, 1982) in the groundnut basin with the aim of improving the performance of production (Rossel et al., 2008; Vall et al., 2003). The animal husbandry is characterized by the coexistence of a traditional system in rural areas and a modern system in urban and peri urban areas, and it has mainly developed in center, north and part of the south eastern of Senegal. These zones have favorable zoo-technical and sanitary conditions for the survival of horses (Biot & Binswanger, 1987; Vall & Havard, 2004). As a result, almost all horse are raised in the rural farming system in the north and central areas of the country. In the center where the dominant activity is crop production followed by livestock, producers use horse in transporting crop residues, preparing field soils, in the drainage of water, in transporting people to weekly markets, and sometimes even medical evacuations to health centers (Biot & Binswanger, 1987).

Working animals are particularly important for food security of small farmers, because in the absence of modernization, all agriculture in the country is based on animal energy produced in particular by horses (Fall & Faye, 1999; Biot & Binswanger, 1987; Berrett, 1982). Moreover, the importance of horses is manifested in the domain of sport, recreation that is booming and in the establishment based the number of working animals he possesses, so that in these agricultural zones the number of horses is strongly correlated with the agricultural area managed by producers. The economic role of horses and donkeys in both rural and urban areas has not been given particular attention, whereas these are the animals most used in transportation and fieldwork because of their speed, their strength and especially their maneuverability (Fuller & Aye, 2012; Rahman & Rahman, 2009). Unfortunately, the use of horses face many constraints and exploitation, especially access to quality food sources, sanitation of housing areas, untreated or poorly treated diseases, and lack of
general management practices. Despite these constraints that may affect their performance, horses play an important role in agricultural and economic development. Their use will continue to be relevant due to the low income of producers and the inadequacy of certain techniques for small farms.

If the welfare of working animals is included in the extension system these low levels of knowledge would be alleviated. The horse users will evolve or change their management practices. Indeed, numerous studies have evaluated and improved the welfare of certain animals, especially farm animals, although there is still much to do especially in sub-Saharan countries like Senegal (Lhoste et al., 2010a; Lhoste et al., 2010b). Therefore, an educational program addressing animal welfare conducted by extension agents and faculty members would contribute to increase the knowledge and skills of working animal owners. As a result, professional technicians who are involved in the management of working animals will help to overcome the lack of knowledge and skills of the owners and users by implementing these concepts in the extension system programs.

**Purpose and Research questions**

The purpose of the study is to develop a set of recommendations to improve the educational program planning and teaching skills of educators in the extension system by focusing on extension educational approaches to teaching animal welfare of working animals. By conducting educational program planning for state agents and university faculty members in Diourbel and Thies regions, they will be able to develop several sets of points that will help them to improve the training opportunities offer to local farmers to improve the welfare of working animals by extension educators.

The four major questions guided this study:
1. How are agricultural extension programs currently taught, presented or offered for other owners of other animal species in the Diourbel and Thies regions of Senegal?

2. How do extension agents and animal management faculty members respond to experiencing student focused teaching practices in their professional training?

3. How do extension educations in Senegal recommend student-centered teaching practices be used in extension program?

4. How do extension educators and faculty members assist farmers in ensuring that accepted standards of welfare for animal husbandry are maintained including the care, feeding and physical wellbeing of domestic animals?

**Importance and justification of the study**

This study is important because the participation of faculty members and extension agents in the elaboration of extension programs and the facilitation of the professional education program are a significant contribution in the actual agricultural extension system, as well as the continuing professional and academic education programs (Upjohn et al., 2010). This study also focuses on the development and improvement of animal welfare training programs offered to farmers by the extension system in Senegal (Lhoste et al., 2010a). In order to illustrate the necessity of the improvement of animal husbandry practices, the program focused in welfare for working animals. Because of the low power of influence of the extension agents, inadequate organization of the extension system, and poor career development prospects for the proposed extension workers, it is essential in the current conditions of degradation of rural agricultural production along with climate change to reinforce the extension system by improving extension agent capabilities especially in developing countries like Senegal (Anderson & Feder, 2004).
The development and function of the extension services in developing countries are offered by both public and semi-public institutions as well as non-government organizations (NGOs). Historically, these institutions are generally associated farming activities with others such as input supply, agricultural equipment and funding of producers. Today, they continue to play the same role, but more concentrated in the promotion of women and food crop production. Extension educators participate in the modernization of the agricultural sector with the support and training for producers, organization of the markets of agricultural products and implementation of agricultural policies for the development of all sectors of rural areas (Knuth & Knierim, 2013; Okorley, 2007; Weiss, 2006). However, the distribution of these extension institutions has posed problems and continues to cause problems today because of their poor systems of outreach in rural and urban areas. In addition, insufficient networks between public extension agents, NGOs managers and para-public sectors are accentuated by duplicating the distribution of roles which is unfavorable for the sustainable development of family farms. As result of these dysfunctions and lack of performances, the function of extension agents are generally neglected by the policymakers and funders in developing countries (Rasaga et al., 2013; Dinar et al., 2007; Swanson et al., 2003).

The extension system should play a new role in the developing countries with support from policy makers who must pay special attention to its reform and modernization. As a result, extension agents could be a formidable force in the growing demand for practice-oriented educational programs. These opportunities could be useful for policy makers as the work to improve policy decisions and increase funding possibilities for the extension systems and advisory supporters. To ensure the success of the animal husbandry programs, capacity building
of extension agents should have an important place in the implantation process of future extension programs.

**Conceptual Framework**

Implementing program planning is an important part in human development, but it is often neglected by policy implementation. Ensuring that knowledge and ideas are shared with different groups of people is an important part of enabling them to perform their work effectively and achieve the desired outcomes. In addition, extension can help to facilitate outreach and communication to stakeholders at a local level including farmers, nurses and consumers, particularly those in rural areas (Ilvento, 1997). Program planning is a dynamic process (Caffarelle & Daffron, 2013; Cervero & Wilson, 2006) whereby, acquired knowledge at individual and institutional levels are required as catalyst for change. Program planning involves not only the individual level for researchers, extension staff and farmers, but also the political and social forces involved in the extension education such as the audience in which planners are facilitating or stakeholders of the specific program. Thus, misunderstanding or ignoring the reality of the political and social forces can lead to a tragic outcomes. Cervero & Wilson explained the importance of these two factors in the evolution extension organization... Being involved in the extension system as a faculty member requires to put in account the obstacles in identifying the vital stakeholders of a specific program.

Despite the improvement needs in extension education in the universities and extension offices, these services have been almost the primary advocate supporting the necessity of...
improving or changing extension approach and principles (Jacobson & Kar, 2013). Continued professional educational training of extension workers allows them to act as facilitators in their work with animal owners and prepare for specific support to specialists on technical themes that helped to manage complex technical issues concerning animal welfare (Caffarelle & Daffron, 2013). The needs imply that a democratic negotiation is necessaire to determine their learning needs (Lindeman, 1926), limit power impact and relationship in the process of planning. The planning theory describes the interaction between educational needs, political power of the group and political power as routine in program planning (p.124-125), therefore, planners must recognize who has the power within planning group and who can influence the direction of the planning process and outcomes (Cervero & Wilson, 2006).

The steps to implement program planning as an integral part of the Senegalese extension system strategy included the need to analyze the strengths and weaknesses of the existing capacity and skills for people (Caffarelle & Daffron, 2013). In the preparation phases, planners must convince and prove to the stakeholders that their programs are valuable to the community, so that they could identify the need of prior planning that could lead to an imperative success of the program. By diversifying the origin of the participants, educational program planners negotiated democratically the educational program, listen to diverse voices, and had the ability to operate and manage power (Cervero & Wilson, 2006). Because of the interaction between the extension agents and faculty members, as well as their important role in developing and implementing an animal husbandry program, systematic and consistent collaboration between the them are critical and may be conducted through official networks, workshops, panel, among others involving all of the faculty members and extension agents (Hennessey et al., 2010; Forrer et al., 2010, Caffarella, 2002). Educational program planners can develop and assess the impact
of different response strategies on the management of animal welfare into the farm production (Garner et al., 2007), and identify the important strategies to make the program lessons relevant to the audiences.

**Personal Reflection**

In the field of agricultural extension education, I believe that faculty members and extension agents need to integrate the process of continuing professional education by working together and sharing information in improving the educational process and extension delivery methods. As a faculty member in animal husbandry I learned that planning is the process of determining organizational goals, developing premises about the current environment, selecting the course of action, initiating activities required to transform plans into action. Also, it is important to evaluate outcome, or a series of decision from general and strategic decision to specific operational details, based on the gathering and analysis of a wide range of information (Cervero and Wilson, 2006; Gibson, 2001; Swanson and al., 1997). Completing, the program planning class has provided me the potential for the empowerment of my teaching practice. Per consequent, the planning process challenged my positive epistemology about the teaching process particularly in teaching extension professionals. This has influenced the development of my skills, knowledge and abilities to take full responsibility in my teaching process in the extension system.

I knew the Extension specialists from the local extension office and faculty members were my colleague at the university. Greene (1988) cited by Kelsey and Mariger (2003) discovered that giving extension professionals a voice at the program-planning table increased the probability that they would use study findings to improve works. Extension professionals who participated in this study are experts in animal husbandry and rural development, and their voice
in the process can represent the majority of the members of the extension system. I implemented a continual professional development program for extension educators after completion of the participant interviews and extension document analysis, because I believe that participants should know about existing program design principles, implementation practices and program assessments available for use in their educational programs. I believe that by helping them to learn within the continuing professional development program, they will be able to validate the precision and relevance of information for animal welfare.

Conducting the research process led me to reflect on my experiences as a faculty member and as a graduate student. In addition, I learned that extension educators lack the opportunity to design programming ideas is critical because they have lacked the opportunity to design program that address specific needs for breeders and express extension professional needs. Therefore, a collaborative relationship with participants was maintained because they saw me as their peer, and these good relationships helped to define and explain expectations (Haverkamp, 2005; Suzuki, et al., 2005). From my experience as a graduate student, I wanted to integrate participant centered teaching strategies into the program to improve the teaching and learning experience

**Definition of Terms**

**Adult**: An individual whose age and biological maturity satisfy an expected mentality, form of behavior and a set of social roles.

**Adult education**: Activities or system that provided to learners new skills and knowledge through a variety of methods, formal or non-formal, using both print and non-print teaching and learning tools.
**Adult learner**: All the teaching / learning process designed for adults by using formal or non-formal system in order to increase their knowledge and improve their professional qualifications.

**Animal Husbandry**: It is the all technic management and care of farm animals by humans for profit and pleasure in which genetic qualities and behavior, considered to be advantageous to humans, are further developed and improved.

**Animal welfare**: The concept of animal welfare refers to the state of the animal, the treatment that an animal receives, is covered by other terms such as animal care, animal husbandry, and humane treatment.

**Program**: A plan limited in time that gives details to the learning situation. It explains the materials and resources that can be used to facilitate the learning process.

**Welfare**: It is the manner that an animal is coping with the conditions that surround it. It also is cognitive appraisal, experiencing positive emotions; and experiencing few negative emotions.

**Working animals**: animals raised to work for human included horse, donkey, beef, mules and camel.
Chapter 2: REVIEW OF LITERATURE

Purpose and Research questions

The purpose of the study is to develop a set of recommendations to improve the educational program planning and teaching skills of educators in the extension system by focusing on extension educators. By conducting educational program planning for state agents and university faculty members in Diourbel and Thies regions, they will be able to develop several sets of points that will help them to improve the training opportunities offered to local farmers to improve the welfare of working animals by extension educators.

The four major questions guided this study:

1. How are agricultural extension programs currently taught, presented or offered for other owners of other animal species in the Diourbel and Thies regions of Senegal?
2. How do extension agents and animal management faculty members respond to experiencing student-focused teaching practices in their professional training?
3. How do extension educations in Senegal recommend student-centered teaching practices be used in extension program?
4. How do extension educators and faculty members assist farmers in ensuring that accepted standards of welfare for animal husbandry are maintained including the care, feeding and physical wellbeing of domestic animals?

Adult education in African context

The program planning studies in adult education provide a source of planning theory and models to draw upon as a resource to examine the planning practices in agricultural education. Adult education is defined as a whole processes that provides new skills for adults to be
successful in life through training in formal or non-formal programs (Tahir, 2000). Different theories and models have been developed which could be used to examine the planning practices in agricultural education (Jarvis, 1995).

CONFINTEA stated that:

Adult education started in Africa before any other Continent in the world. Indeed, school system were instituted first in Africa before the creation of the Greek alphabet and the use of Latin words. African adult education is very old according to Cheikh Anta Diop historical as well as Barry J. Kemp (2006), David M. Carr (2005) Henri J. Martin (1995). Indeed, Ancient Egypt still used scribes to write in the administration, philosophy and teach the royal court to read and write (Ki-Zerbo, 1990; Omolewa, 2000). The English government first used the term of Adult education in the 18th to explain government policies for adult literacy programs (Cookson, 1998). We cannot talk about adult education without discussing Eduard Lindeman who discussed many concepts of adult education in his book, *The Meaning of Adult*. He is an important founder of the modern adult education. He identified the importance of the place in which adult education takes place, the identification of stakeholders and gave direction for adult education (Lindeman, 1926). The role of learners as participants in the planning of his or her education has varied across the program models as they have evolved through history. In order to increase agricultural production with a maximum protection for
working animals, the role of the communities and their engagement in the participatory method of training and designing program for sustainable animal welfare improvement has become crucial in Senegal (Dijk & Pritchard, 2010; Upjohn et al., 2010).

The recognition of the traditions of adult education in Africa is important because it helps people to learn the living conditions, traditions and culture of their ancestors. It also provides information about past strengths and weaknesses which can be used to improve the future. In Africa, this information contributes in the process of learning. Understanding the history of adult education in Africa is necessary to make programs responsive to local issues and the development of local communities, and as educational programs can be designed to address the immediate and pressing needs of local residents (Draper, 1998). European and American versions of adult education appeared as a new and significant concepts in Africa during the 1990s, as a part of the strategies for development. In the goal to modernize African communities, the traditional type of adult education began to serve as an intervention for adults looking for additional training, or an initial training for those who do not have access to formal education. Modern and formal education systems have now begun to dominate African culture and society, as a consequence, there is a loss of the values that are the most important part of the traditional educational practices (Nkomo, 2000; Teffo, 2000). Indeed, this lost has affected not only the local knowledge, but also the teaching of traditional to the generations. To address this issues, a reorientation of the educational programs is needed in order to respect the indigenous cultures and practices. Therefore, it is indisputable that contemporary adult education practices must be recognized and developed that enhance cultural traditions as an academic discipline in African universities.
In Africa, the ancestors use a traditional model to educate people, and they left this heritage for education that served as the basis for creating great empires. All these political empires have experienced some form of stability resulting from the control exercised by the elders of the community through education in which people were systematically socialized and standards practices. This means that education in Africa did not begin in the colonial period; instead, Africans have been the great educators and trainers of the local people. It was in this context that young people were trained for adult life, as mentioned by Busla (1968). The young, for example:

Were prepared for their social roles in the home, the village, or town, or tribe. They were constantly being made aware of the community to which they belonged, in and for which they were trained through work and play and religious rites, through songs and dance and folklore, through customary service received or given within [an] all-embracing network of family and kinship ties (Busla, 1968: 15).

Thereby, they can cope with effectiveness the up and down life situation at any time and everywhere.

By recognizing this, it is important to develop education opportunities by taking into account all of the target population and all modalities for adult education and learning processes, while remaining within a holistic vision of learning throughout life (Merriam & Caffarella, 1999; Gee, 2001; Belzer & St Clair, 2003). In addition, Adulthood was traditionally celebrated through non-formal education programs that addressed a number of issues directly concerning the cohesion and stability of a society such as marriage and procreation, initiation for boys and girls in which they received useful training in day-to-day dealings within the society in which they lived (Mgadla, 2003). Moreover, this was itself educational, and every adult was a potential
educator and then the educational field was not the educational institution, but it was the society in the condition of work (fields, forges, forest, the river, etc.). This formation, organized and developed by elders and leaders from the local communities who were respected for their knowledge of cultures and their integrity in preserving such cultures, offered opportunities for people to learn, adapt and improve their life condition as well as prepare for future social position and administrative position (Hermans, 2004). The traditional educational system was collective, since the individual was always defined in relation to the group which ensured their education (Peatrik, 1994). Thereby, knowing these reasons, it is essential to adapt learning modalities and activities as well as educational experiences to address these specific requirements of adult learning conditions. Because the main objective of the educational process is to prepare an individual to take his or her full place in the society and to cope with the realities of life, there were no distinct or formal educational institution of society within traditional educational system (Matos, 2000).

Before the independence for West African countries which occurred in 1960, the aim of the traditional education was to provide information, skills and competencies necessary in daily life and in the society (Nkomo, 2000; Mgadla, 2003). The comparison of the modern (colonial system) and traditional educational systems show the negative impact of destroying the fundamental base of the African society because the colonial education system does not deal with individualism and individual interests. Indeed, the colonial system broke down the traditional education in Africa that was always based on the transmission of a number of values (ways of being and acting recognized and shared by members of a society) such as the community supremacy over the individual, solidarity, respect for elders. Furthermore, the colonial system was designed to serve the interests of other cultures by spreading their lifestyles
and cultural practices of community, which was also completely unfamiliar to Africans (Ki-Zerbo, 1990; Burke, 1996). In addition, the European colonizers thought that European culture represented a superior civilization to which the school was to lead the colonized. In short, the colonial school caused a "clash of cultures" (Deblé, 1994) and disrupted not only the cohesion between education and society, but more broadly social order itself.

After the independence, the literacy and adult education are progressively included in the national development policies in the context of African education. There also appears to be a level of access to other areas of learning and the exercise of the different social roles of adults. In addition, education can be appreciated as a possible strategy to encourage adults to think about their own questions and problems they pose and face while seeking appropriate solutions (Hillman, 2002). However, it was not until the late 1990s that literacy and adult education were truly considered as integral part of national education policies and redirected to serve local needs (Matos, 2000). Now, adult education needs to prepare African people in their new life and sensitize them to ways in which their societies can be developed. The leaders of the new states of Africa face the challenge of building a skilled workforce for the development of their countries. The educational model inherited from colonization produced uprooted citizens and must be replaced by an educational system that is responsive to the need for African people to interact with the natural world around them (Matos, 2000). It was also required at that time to solve the problem of identity and the alienating characters of the educational institution.

Extension Education

Extension education is indispensable in the improvement and development of life for farmers in Senegal. It provides not only expert assistance to raise the level of production and processing, but also diffuse information and support the transfer of knowledge, skills and
scientific findings from theory to practices (Mezirow, 2000; Norris, 2003; Merriam et al., 2007).

In other terms, it helps to increase production, income, or even to participate in the amelioration for family living by increasing their prosperity. Extension education systems play an important role in the development of agricultural production. The agricultural extension agents must be aware of psycho-social and social aspects of group action and individual counselling. The extension education system is an educational process which can be used to diffuse the desired transformation in the productivity of agriculture for farmers. Indeed, the extension education uses teaching and learning processes to disseminate knowledge and skills for bringing about the maximum number of people with the desirable and required changes to them (Scarborough et al., 1997). Despite, the extension agents are facing numerous problems and relevant solutions are not found until now.

Extension education is defined by several professionals and practitioners in the field of knowledge generation including (Srinath, 2002; Sharma, 1998; Van den Ban & Hawkins, 1996; Rasmussen, 1989) as the processes that teach and diffuse knowledge for farmers, rural population and producers to have a better life and learn how to improve their livelihoods. Extension education uses the learning by doing teaching practices, similar to the experiential learning process, in partnership with government agencies, the private sector including the Fiber and Textile Development Company, Senegalese Council for Organic Agriculture, NGOS and the people in local communities. The principal goal of extension education is the development of people through the application of new information regarding the latest technologies, technological innovation, knowledge and skills in a specific community context (Scarborough et al., 1997). It is well developed with its own philosophy, principles, objectives, methods and techniques that must be understood by extension specialists, faculty members, funders and the
The principles, methods and techniques of the extension education programs are applicable not only to agriculture but also home economics, health, and family planning. By knowing and using the principles of educational program planning that consider participant interest and needs, cultural differences, motivation for participation and adaptability, the extension agents can be successful in their duties and objectives to put out the development educational, social, economic and political developments of people. Extension education is different from the formal education in the way that its educators prepare people to solve their daily life problems, verses formal education in which educators prepare student for their life after school (Baren-Stein & Draper, 1993; Kwoles, 1990). It may, however, be mentioned here that when extension education is put into action for educating the rural people, it does not replace formal education. In that sense, there are several differences between the two (Chauhan, 2000). The table below shows some differences:

**Table 1: Comparison between Formal Education and Extension Education**

<table>
<thead>
<tr>
<th>Formal Education</th>
<th>Extension Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The teacher starts with theory and works up to practical.</td>
<td>1. The teacher (extension worker) starts with practical and may take up theory later on.</td>
</tr>
<tr>
<td>2. Students study subjects</td>
<td>2. Farmers study problems.</td>
</tr>
<tr>
<td>3. Students must adapt themselves to the fixed curriculum offered</td>
<td>3. It has no fixed curriculum or course of study and the farmers help to formulate the curriculum</td>
</tr>
<tr>
<td>4. Authority rests with the teacher</td>
<td>4. Authority rests with the farmers</td>
</tr>
<tr>
<td>5. Class attendance is compulsory.</td>
<td>5. Participation is voluntary</td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td>---</td>
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</tr>
<tr>
<td>6. Teacher instructs the students.</td>
<td>6. Teacher teaches and also learns from the farmers.</td>
</tr>
<tr>
<td>7. Teaching is only through instructors.</td>
<td>7. Teaching is also through local leaders.</td>
</tr>
<tr>
<td>8. Teaching is mainly vertical.</td>
<td>8. Teaching is mainly horizontal.</td>
</tr>
<tr>
<td>9. The teacher has more or less homogeneous audience.</td>
<td>9. The teacher has a large and heterogeneous audience</td>
</tr>
<tr>
<td>10. It is rigid.</td>
<td>10. It is flexible.</td>
</tr>
<tr>
<td>11. It has all pre-planned and pre-decided programs.</td>
<td>11. It has freedom to develop programs locally and they are based on the needs and expressed desires of the people.</td>
</tr>
<tr>
<td>12. It is more theoretical.</td>
<td>12. It is more practical and intended for immediate application in the solution of problems.</td>
</tr>
</tbody>
</table>

Chauhan, 2000

**Senegalese Extension System**

The purpose of extension services is to educate people such as producers, agribusiness, other entities about new technology, policies, and practices that may increase profitability, reduce pollution, or benefit society in some other way. The evolution of the extension system in Senegal has developed in four principal periods: the first period 1960 to 1980, the second period 1980 to 1989, the third period 1990 to 1997 and the last period which started in 1997. Each period has specific goals related to the specific needs for the rural population to ensure sustainable development. The extension system in Senegal has used different approaches to
spread and disseminate information for farmers. These organizational approaches are rural mobilization, commodity-oriented extension methods and extension classic methods.

The diversity of goals within the extension system require the establishment of modern mechanisms and procedures that govern the relationships between the various agricultural and rural advisory providers in order to facilitate the implantation of extension programs (Caffarella, 2002; Cafferella, & Daffron, 2013). These modern mechanisms and procedures facilitate the coherence and harmonize the level of communication between extension services, as well as agricultural and rural counseling methods through the entire national territory to achieve the goals of human development, improved living and working conditions, and increased productivity (Knuth, U., & Knierim, A.2013; Koundinya, 2010; Kapetanakis, & Kudenko, 2002).

In addition, the modernization of the agricultural system is dependent on the shifts that will need to happen in the extension system. Extension services are still quite limited not only because they are underfunded, but also because many of the end users lack sufficient education to be able to respond to new information.

Animal husbandry in Senegal

Animal husbandry is an essential component of the Senegalese economy and occupies a dominant position in the search for food self-sufficiency. The value of animal husbandry is estimated to be up to 847.48 billion CFA francs in 2011, of which almost 585 billion is only from ruminants (MEF, 2011). Based on the great Senegalese household survey (RGPHAE, 2013), over 56% of Senegalese households practice animal husbandry and 7% have of oxen, 16.7% own small ruminants and 32.4% have the two types small ruminants and oxen. Most rural
households (nearly 55%) rise both cattle and small ruminants (MEL, 2009; RGPHAE, 2013). However, in Dakar and other cities, the small ruminants dominate the animal husbandry system.

In recent years, there were a real dynamism with significant increase in performance, especially in terms of adding value, thereby strengthening the contribution of local industries in meeting national demand. The added value of animal husbandry at current prices increased from 236 billion CFA francs in 2008 to 243 billion CFA francs in 2009, an increase of 3.2% against 7.9% a year earlier. It represented 24.8% of the total value added of the primary sector against 27.1% in 2008, in liaison with the dynamics of agriculture (up to 1.1 points) and mining and quarrying (extractive operations) up to 1.3 points (MEL, 2009; RGPHAE, 2013). Several constraints hinder the increase in productivity of animals. These constraints are primarily related to water, food, health, husbandry practices and the flow of products. In addition, the extension of crops and hunting zones significantly reduce space reserved for livestock. The alternation of wet and dry seasons, and the erratic nature of rainfall deeply mark the animal production systems. The breeding system practices depend on many factors, the most important is the rainfall patterns. Thus, depending on the availability of water and feed, there is a particular type of animal husbandry system in a given region.

In Senegal, there are three production systems namely. The pastoralism is essentially an extensive production system, which is in other words entirely dependent on natural resources, including water and fodder (Adriansen, 2008). The main feature of the pastoral system is the migration of humans and animals with the seasons. Depending on the form taken by this movement, this is either nomadism or transhumance. Nomadism is an irregular migratory movement that is primarily found in the north-Saharan zone, while transhumance migratory movement is a more or less regular, yet is also subject to seasonal fluctuations and follows a path
from the Northern Sahel to the south, or north to the northern Sahel-Sudan zone (Adriansen, 2008; Graf et al., 1992). Natural pastures constitute the essence of feeding cattle. But the composition and evolution of the feeding value of pasture vary with rainfall (Ndiaye et al., 2003). The agro-pastoral system is based on the association of livestock to rain supported crops (millet, groundnuts, cotton, etc.) and irrigated crops (rice, tomatoes and onions). The semi-intensive grazing system is used more in mixed-use areas where agricultures dominants the land use (Ba Diao, 2004). In this system, man intervenes by making improvements in the herd. It is characterized by the size of the often small herd and management of part of the animal health. Animals live in pens or are simply attached to stakes planted in fallow for manure. They receive a supplementary ration during the evening milking before their return to grazing and in the morning before departure (Mbaye, 1982). Animals are brought in rainy season into the more wooded areas or on routes kept aside temporarily for pasture (Rukunda, 2009). Peri-urban farming systems have recently been developed to partially meet the rapidly increasing demand of cities in animal products. They often involve short-cycle species (poultry, pigs) but also intensified forms of ruminant livestock (milk and especially fattening). It affects 1% of cattle and 3% of small ruminants. The farms are intensive and semi-intensive (Rukunda, 2009). In this type of farming, animals are kept in conditions of housing, feeding, assistance and perfect care. Intensification will always hand in hand with stabling and in this type of farming production strategy must always be set through the possibilities of forage crops and enhancement of agro-industrial and household-products. A rather general definition of the concept of production system: all techniques and practices implemented by a community to operate in a given space of plant resources intended for animals, under conditions compatible with its objectives and constraints of the soil (Bernard, 2008; Lhoste, 1984). It is clear that this notion of production
systems can be applied to different levels of scale; it is relevant at the farm level, it remains at the level of the rural community and to larger groups. The production systems shall implement use patterns of space, the relationship between animal production and plant productions and productions evaluation methods (Adriansen, 2008).

**Welfare and animal husbandry in Senegal**

**Concept of Animal Welfare**

The research defines the welfare and explains evidence of the welfare of an animal (evaluated according to scientific evidence) requires some fundamental criteria such as good health, sufficient comfort, good nutrition, safety, and ability of the animal to express natural behavior, lack of pain, fear or distress (OIE, 2011, Broom, 2007; Webster, et al., 2004).

According to the Health Code of the OIE Terrestrial Animals (2011): 

> There is no single definition of working animal (horse, donkey, mule and cattle) welfare, but there is agreement that it includes both physical and mental components. Many definitions have been put forward to define animal welfare. One way of assessing welfare is by using the Five Freedoms framework (Fraser, 1997):

... **Freedom from Hunger and Thirst** by providing ready access to fresh water and a diet to maintain full health and vigor.

... **Freedom from Discomfort** by providing an appropriate environment including shelter and a comfortable resting area.
... **Freedom from Pain, Injury or Disease** - by prevention or rapid diagnosis and treatment.

... **Freedom to Express Normal Behavior** - by providing sufficient space, proper facilities and company of the animal's own kind.

... **Freedom from Fear and Distress** - by ensuring conditions and treatment which avoid mental suffering.

This framework assumes that the resources provided to an animal will produce an animal with good welfare (FAWC, 2009). However, this is an ideal world scenario and provision of an

... the animal has dental disease and is unable to chew and digest the food properly

... the animal suffers from bullying by other animals and is unable to eat enough food

... the animal is overworked and does not have sufficient time to eat

... Etc.

and to ignore the inputs. One such framework considers welfare as consisting of three overlapping components (Rollin, 1999):

... **Physical component**

... **Emotional component** (minimizing negative states such as fear, distress, pain and maximizing positive emotional states such as comfort, contentment, etc.).

... **Behavioral component** μ considering if an animal is able to carry all those behaviors...
different animal based welfare measures. Animal welfare is an essential component of the movement for sustainable agriculture. The designated operating methods avoid the depletion of resources while contributing to rural development. The Common Agricultural Policy provides financial assistance to farmers to comply with legislation on animal welfare or to apply higher standards than the legal requirements (DGHCP, 2007).

The animal welfare research conducted in poor communities contributed to the amelioration of the condition of living and wellbeing of working animals (Whay, 2010). The finding and contribution of veterinarians, scientists, experts and government agencies on working animals, animal welfare and environmental issues have helped to start improving animal husbandry and its ethic (Pearson et al., 2007). Now animals are estimated as creatures capable of feeling pain, so it has become necessary to protect and respect them as living beings and thus to ensure the safeguarding of their health, physical, psychological or in the exploitation of their forces (Carretero et al., 2005; Colunga et al., 2005; Pritchard, 2003) in different areas of economic system such as farm work and the water drainage, transportation of people and goods, and sport activities.

**Animal welfare in the extension system in Senegal**

Extension specialists have the responsibility to share the concepts of welfare in the animal husbandry to inform producers and farmers. Also, understanding of the existing lack of information about animal welfare in the extension system may help farmers to improve their responsibility and knowledge (Prokopy et al., 2008; Gendenning et al., 2010). Indeed, animal welfare is well known and well taken care of by the producers in developed countries, but in developing countries like Senegal, the welfare of an animal is not included in the production
system and the use of animals. In addition, it is clearer that the principle of welfare animal must be applied first for working animals. In order to illustrate the necessity of the improvement of life for the animal husbandry, the program faced in welfare for working animal. The working animals are very popular in Senegal, they are used as a light working animal for farm work, in the transportation of people and goods, and in the water drainage system. Also, they are involved in almost all different sectors of socio-economic activities. Thereby, seeing the role, importance and impact that working animals play in Senegalese agriculture an educational program for extension agents and faculty members on animal welfare should contribute to the life improvement of animals (Wilson, 2002; Stringer et al., 2010).

Despite the strong need for their contribution to production systems related to the socio-economic situation in Senegal, the welfare of working animals are not satisfying in many ways in the regions. However, although the current situation is certainly difficult, people are aware of the issue and are willing to change the working (NAD, 2004). Because, today, for a family that does not have horses or donkeys in these areas, it is almost impossible for them to cultivate large areas especially during the transition to lean period (Fielding & Starkey, 2004). However, the ability to boost these horse and donkeys welfare are blocked by a chronic lack of basic information in a context of poverty and environmental degradation (Khodobo, 2006). In Senegal, we note a regulatory system which includes the protection of working animals in their work. However, all of the current regulations do not focus on animal welfare. Therefore, we note a broad system of protection acts that problems. This situation is the result of a lack of knowledge and organization for the animal owners (AAHC, 1999; Patrushev & Patrusev, 1939), extension agents and faculty members.
Extension specialists have the responsibility to share the concepts of welfare in animal husbandry to inform producers and farmers. Also, understanding the existing lack of information about animal welfare in the extension system may help extension agents to cope with difficulties and their responsibility in order to improve their knowledge (Prokopy et al., 2008; Gendenning et al., 2010). Indeed, animal welfare is well known and well taken care of by the producers in developed countries, but in developing countries like Senegal, the welfare of an animal is not commonly included in the production system and the use of animals. In addition, it is clear that the principle of welfare animal must be applied first for working animals. The working animals are very popular in Senegal, they are used as a light working animals for farm work, in the transportation of people and goods, and in the water drainage system. Given the role, importance, and impact that working animals play in Senegalese agriculture, educational programs provided by extension agents and faculty members on animal welfare should contribute to the life improvement of working animals (Wilson, 2002; Stringer et al., 2010).
Chapter 3: RESEARCH DESIGN AND METHODOLOGY

Purpose and Research questions

The purpose of the study is to develop a set of recommendations to improve the educational program planning and teaching skills of educators in the extension system by approaches to teaching animal welfare of working animals. By conducting educational program planning for state agents and university faculty members in Diourbel and Thies regions, they will be able to develop several sets of points that will help them to improve the training opportunities offer to local farmers to improve the welfare of working animals by extension educators. This descriptive qualitative study connected qualitative data derived from participant observations, interviews, focus group and qualitative document analysis. The extension agents and teachers involved in animal husbandry and animal extension system served as participants. Four major questions guided the study:

Research questions

1. How are agricultural extension programs currently taught, presented or offered for other owners of other animal species in the Diourbel and Thies regions of Senegal?

2. How do extension agents and animal management faculty members respond to experiencing participants focused teaching practices in their professional training?

3. How do extension educations in Senegal recommend participant student-centered teaching practices be used in extension program?

4. How do extension educators and faculty members assist farmers in ensuring that accepted standards of welfare for animal husbandry are maintained including the care, feeding and physical wellbeing of domestic animals?
Rationale for qualitative case study design

This was a single case study of extension specialists and university faculty involved in the animal husbandry extension and teaching system in Thies and Diourbel. Each participant who consented to participate served as a unit of analysis. This case did not propose to represent the responses of all the extension system across the country, but it focused on a specific extension program delivered educational program for animal owners. The case study provided the opportunity for the researcher to examine the work and delivery methods of extension agents and faculty members used to provide information for in the existing animal husbandry extension program (Baxter, 1985; Mumbuna et al., 1991; Akabwai, 1993).

Compared to other research methods the case study has a strength in that provided variety of evidence which was collected through an array of techniques including document analysis, interviews, observations and a focus group in effort to provide a triangulation of evidence in the data analysis (Yin, 2003). The process of interviewing provided opportunities for both formal, structured interactions with participants and their reactions to improving the extension services through educational program, as well as informal conversation (Rossman & Rallis, 2003). Interviews provided rich descriptions of the ways participants engage in extension processes. As describe by Yin (2003), a case study may use development of a set of priori propositions based on the research questions and the related literature that can guide the data collection and analysis process.

Research Design

Yin (2003) describes several theories relevant to case studies, including diagnosing organizations, which focus on the logical problem and not logistical, its relationship and critical
The purpose of this case study was to examine the extension system's education and training program for extensions agents and faculty members in Diourbel and Thies regions. The research focused on social development of people by improving their condition of social life and professional development with the support of a continuing professional education program planning framework (2006) adult education program planning theory. The participants selected for the study were the four state extension agents from the regions and three faculty members from the department of animal production at the regional university. The researcher used multiple means of data collection associated with the descriptive case study including:

1.) Qualitative document analysis (Yin, 2003),
2.) Formal in-depth interviews with each extension agents and faculty members,
3.) Participant observation of a continuing professional education program for extension agents and faculty members involved in animal management education,
4.) A single focus group that provided a member check (Patton, 2002) of the working themes developed in the preliminary data analysis.

The data collection process began with the selection of participants from the entire group of stakeholders and then included the following sequence of activities: individual interviews with each participant, document analysis of extension and government materials associated with the educational programs in animal management offered through extension agents, the continuing professional education program planning committee meeting conducted to provide the group
with an opportunity to discuss the final list of workshop topics that would be included in the extension education program for animal welfare, completion of the continuing professional education program and concluded with a focus group (Appendix I) discussion of preliminary finding.

**Sampling and participant selection**

Participation in this case study was based on the existing extension programs for animals and the agricultural education program in the department of animal production at the university. The participants selected for the study were the four state extension agents and three faculty members from the department of animal productions as the sample for this case study, as their experiences were relevant to the research questions (Stake, 1995; Schwandt, 2001; Patton, 2002). The reason why the group was chosen was to collect and analyze data that would be gathered from their insights and statements. All of the faculty members and extension agents participated in the interviews and in the focus group.

**Contacting the case study group**

After receipt of IRB approval (Appendix J and K), initial contact was made with the head of the extension office and the head of the department of animal production. The researcher provided these individuals with a general overview of the case study and a working of the interview and observation protocols as well as consent forms (Appendix F and H). Once approval was granted by these authorities, the researcher met with the participants to discuss the purpose and overview of the case study. This discussion included ideas regarding animal welfare instruction for the participants, the current practices and delivery methods within the extension system, review of the consent forms, review the working interview protocol (Appendix L), as well as the proposed interview schedule (Yin, 2003).
Consent forms (Appendix A, B and C) and a letter from the researcher (Appendix D and E) detailing an overview of the case study was sent to the participants by email for review prior to meeting with the researcher (Yin, 2003). The French language was used for all discussion with the participants and consent forms were written in French. By using French as the language of program and research activities the researcher avoided the possibilities of misunderstandings because all participants were able to read and understand the French language. The importance and purpose of the consent form was explained to all participants before consent was requested of the participants as it was necessary to document the interactions of the participants as they engage in the research activities.

**Preliminary work**

The Table 2 is the *a priori* propositions used to assist the researcher in the planning and development of the interview guide and observation protocol as described by (Yin, 2003). Indeed, the purpose of the propositions is to provide guidance in where to look for relevant evidence that should be examined within the scope of the research. It explains how the propositions are correlated to the participant interview guides, focus group and observation protocol, as well as the supporting literature.
Table 2: a Priori Propositions

<table>
<thead>
<tr>
<th>Proposition</th>
<th>Supporting Literature</th>
<th>Research Questions</th>
<th>Interview Questions</th>
<th>Observation Guide</th>
</tr>
</thead>
</table>
| The participation of extension agents is integral to the work of continuing extension education program for farmers. | Planning program and program development are a social activity whereby people construct educational programs by negotiating personal, organizational, and social interest in contexts marked by socially structure relationships of power (Cervero & Wilson, 2006, Caffarella & , 2006). | 1. How agricultural extension programs are currently taught, presented or offered in other animal species in the same regions of Senegal?  
2. How do participants in an animal management extension education program respond to problem-based learning?  
1. How to educate farmers in ensuring that accepted standards of animal welfare are maintained including the care, | Describe how do teach animal welfare compound based working animal managements?  
What do think about delivery method used in the extension activities?  
What is your experience by using the extension delivery method?  
Can you give the list the animal welfare compound based on the modern system of working animal managements? | How extension agents shows their knowledge about the delivery methods?  
How extension agents put in practice their skills about the delivery methods?  
How extension agents and faculty member perceive adult education in the animal husbandry system  
How extension agents and faculty members perceive the animal welfare compound?  
Do extension agents and faculty members implement animal |

36
<p>| The communication dynamics within a group influences the ability of individuals to participate in teaching, group discussions and decisions for extension activities. | The ability of individuals to represent their ideas and perspectives within a group is influenced by the power they possess through the relationships that exist between them and others in the group. | 1. How agricultural extension programs are currently taught, presented or offered in other animal species in the same regions of Senegal? 2. How do participants in an animal management extension education program respond to problem-based learning? | Describe the extension communication; particularly those who teach different groups? What should be the conduct of drivers to account for the animal welfare? | welfare compound in their job? |</p>
<table>
<thead>
<tr>
<th>Proposition</th>
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<th>Research Questions</th>
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</tr>
</thead>
</table>
| When farmers value what they are learning, they respond better to animal management program. | Fabus et al., (2012) explained that in response to growing interest in horse welfare and the need for 4-H curriculum for horse welfare curriculum, the used tools are very relevant. | 1. How do farmers respond to an animal management program on welfare for working animal?  
2. How to educate farmers in ensuring that accepted standards of animal welfare are maintained including the care, feeding and physical wellbeing of domestic animals? | What are the constraints of the animal welfare according to the respondent?  
How do you fell being offered about a program planning for welfare?  
What are the prospects for improving the care of the animal welfare?  
How do you see the educational method influence the development or growth of the profession? |
### Table 2: *a Priori Propositions Continued*

<table>
<thead>
<tr>
<th>Proposition</th>
<th>Supporting Literature</th>
<th>Research Questions</th>
<th>Interview Questions</th>
<th>Observation Guide</th>
</tr>
</thead>
<tbody>
<tr>
<td>The relationships between farmer groups responsible for extension education programs will influence how the individuals respond or participate in the management of the program work.</td>
<td>Different groups or organizations that provide continuing professional education programs do so through established relationships influence how they participate in the planning work and how their agendas influence the educational program (Cervero &amp; Wilson, 2006)</td>
<td>1. How do participants in an animal management extension education program respond to problem-based learning?</td>
<td>What do you think about these statements below, and their impact? Maintenance and hygiene of animals? Housing? Health? Sanitary? Feeding? Working condition? You have received training on welfare from the extension or state agents? Is there anything else you would like to share with us regarding the agricultural extension?</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. How do farmers respond to an animal management program on welfare for working animal?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. How to educate farmers in ensuring that accepted standards of animal welfare are maintained including the care, feeding and physical wellbeing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>of domestic animals?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Pilot testing

The interview guide was pilot tested with one extension agent and one faculty member who were involved in the extension system and teach in the field of animal welfare. The pilot test for the initial interview protocol took place two days prior to the first scheduled interview. As a result of the pilot test, the researcher was able to make modifications to the interview protocol based on feedback. Modifications included the addition of questions regarding (1) teaching methods and presentation used for other animal species in the extension system, (2) experiences in working with farmers, (3) feedback provided by the teacher, and (4) how farmers respond and interact with extension agents in their everyday life.

Data Collection

Document Analysis

In this study, data was collected through the review of the documents that were related to the improvement of extension system based on animal welfare education program and program activities. Relevant documents (Appendix E) were requested and selected during the research process and continued to be collected throughout the study as relevant items were identified during the extension team meeting and the individual interviews.

Observations

Observations were made during the extension office meeting as well as the meetings of the teacher teams. These observations were recorded and later analyzed by the researcher. The observation occurred during the meeting that I had with the participant individually, during the implementation of the continuing educational program and focus group.
**Interviews**

The interview was conducted with extension agents and faculty members who were involved in the extension system and teach in the field of animal welfare. The interview for extension agents took in their extension office, and it was an individual interview. The interviewee was reminded about the confidentiality before starting to record data. It was the same thing for faculty member once we scheduled interview with all participants. The length of the interview was between 50 minutes and 90 minutes (Appendix L).

**Continuing Professional Program for Animal Welfare in Bambey**

Participants of the program were the group of extension agents who are active in the extension public office for animals in Thies and Bambey, and the faculty members at Thies University who are involved in the agricultural education program in the department of animal production and still delivered programs for breeders and farmer leaderships. They are selected because their experiences are relevant to the program. Also, the expected substantial information that can be gathered from these group are the main reason why the group was chosen. These people are key elements in the extension activities, and the extension process dependents on their effectiveness. In addition, they are expected to respond to a given situation and function effectively. They can also evaluate the welfare impact on a specific animal species like goats or sheep, and crate opportunities for extension agents, state agents, farmers in order to update their knowledge by proposing new curricula (Cafferella & Daffron, 2013; Cervero & Wilson, 2006). During the program, participants examined strategies that can be employed to improve the extension system for animal husbandry by increasing extension agents and faculty knowledge and skills toward improved welfare for working animals in Senegal. The table below shows the time-line of the program.
Table 3: Animal Welfare Program Time-Line

<table>
<thead>
<tr>
<th>Activities</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 1: Opening session/activity</td>
<td>1/27/2016</td>
</tr>
<tr>
<td>Module 2: diagnostic of the current extension system</td>
<td>1/28/2016</td>
</tr>
<tr>
<td>Module 3: Design and implement effective educational training program for animal welfare</td>
<td>2/1/2016 and 2/2/2016</td>
</tr>
<tr>
<td>Module 5: Evaluation of animal welfare and educational training program</td>
<td>2/8/2016</td>
</tr>
<tr>
<td>Module 6: Using technology in the animal husbandry extension system</td>
<td>2/9/2016</td>
</tr>
</tbody>
</table>

Focus Group

This study used findings developed during the preliminary analysis of the documents gathered from the extension office, observations gathered throughout the program planning, and the individual interviews (Patton, 2002). The focus group took place two days before the end of the continuing professional educational program. Before the focus group began, the researcher reviewed the focus group consent form with the participants and addressed any questions they had about the focus group process or the research project. The social context of the focus group helped participants respond the categories of questions with their own experience from participation in an animal management program. The focus group was audio-recorded to complement the field notes and observations gathered during the session (Hatch, 2002).
Data Analysis Procedures

The specific analysis process followed the process of the program and the different reports cumulated and compared for the final working animals. The researcher used the Windows Media Player© and Express Scribe© transcription software and the Atlis ti© software package to store, manage, code into categories, and aid in the analysis of the transcripts and related documents. Upon completion of the transcriptions, the researcher reviewed the data and begin initial coding informed by the literature outlined in the propositions, the words of the participants, and the interpretation of the investigation during the program. Then, a verification of the coding of the data was reviewed to identify properties and dimensions of the themes, and to demonstrate similarities with others that needed to be integrated into one category to represent the existing set of themes. The manuscripts of the themes were analyzed by the researcher and a consultant connected to the delivery of the continuing professional training program. Yin referred to this process as analytic genera -developed theory was used as a template with which to compare the empirical results of the case (2003, p. 33) as a means of guiding the data analysis procedures. The specific analysis process followed the constant comparative method (Glaser & Strauss, 1967/1995, p. 103) were conducted (Corbin & Strauss, 2008, p. 73) that will be specific to each category as they will be developed.
The researcher knew the extension specialists, associate, agents, technicians, and faculty members from the university from his experience as a teacher in the animal husbandry department. As a result, he was comfortable conducting the interviews for the research and the program planning, and the participants were more willing to share pertinent information and documents. The interviews and focus group (50 minutes to 90 minutes length), 7 planned program days, and the document analysis led the researcher to reflect on his experiences as a teacher. The stakeholders were talkative and shared information on-the-job experiences and working conditions because of connection with the participants of the study.
Chapter 4: FINDINGS

This research study examined ways to develop a set of recommendations to improve the educational program planning and teaching skills of educators in the extension system who are focused on improving their educational approaches with farmers and cart owners to improve animal welfare for working animals. The chapter presents the data found to address the four research questions of this study:

1. How are agricultural extension programs currently taught, presented or offered for other owners of other animal species in the Diourbel and Thies regions of Senegal?

2. How do extension agents and animal management faculty members respond to experiencing participants focused teaching practices in their professional training?

3. How do extension educations in Senegal recommend student-centered teaching practices be used in the extension program?

4. How do extension educators and faculty members assist farmers in ensuring that accepted standard of welfare for animal husbandry are maintained including the care, feeding and physical wellbeing of domestic animals?

The findings provide a detailed discussion of the different subjects from the research questions, and provides also an in-depth understanding of their opinions about the challenge and opportunities of the local extension system. For this study, several activities were implemented to capture data from document analysis, interviews, observation during a planned continuing professional education program for university faculty members and extension agents and a focus group. Between January 15 and February 17, 2016, seven individual interviews were conducted with four extension agents and three faculty members involved in the animal husbandry
extension system. Focus group with seven participants of the continuing professional education planning program in ISFAR at Thies University was conducted before the end of the program to enhance data gathered from the interview. The final piece of the data collection for this study was the observation of the participants' continuing professional education program. All transcripts were read line-by-line to code, separate and analyze the data. Comparison of the data gathered from the research process permitted to identify similarities and differences within the categories and codes in the transcribed interview and focus group. Thereby, the researcher identified themes related to the four research questions, and the impact statements, success stories, constraints, solutions and recommendations were considered as pertinent for this study. Before providing finding to address the first research question, it is important to give the characteristics and background of the participants as discovered during the study.

**Characteristics of the participants**

The results revealed that the participants had a variety of years of experience, academic histories and education levels, professional positions, and roles in the animal husbandry extension system and university system. Three participants were campus-based faculty involved in the extension system and four were extension agents in the animal husbandry public extension system. Participants had similarities in work experience within the animal husbandry system, however, the amount of knowledge held by each participant regarding extension services and how it functioned were different prior to employment. All participants had at least one academic degree in animal husbandry and veterinary science. Other degrees held by participants included general agricultural, agricultural and rural development, and project management. The table 3 summarizes the characteristics of the participants.
Table 4: Characteristics of the participants

<table>
<thead>
<tr>
<th>Participants</th>
<th>Position</th>
<th>Role</th>
<th>Education level</th>
<th>Years of experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diarra</td>
<td>Head of the Departmental extension office</td>
<td>Coordinate the extension activities and services</td>
<td>Labor Engineer and Project manager</td>
<td>8</td>
</tr>
<tr>
<td>Moussa</td>
<td>Extension specialist and previous head of the Departmental extension office</td>
<td>Implement extension activities</td>
<td>Agricultural Engineer</td>
<td>25</td>
</tr>
<tr>
<td>Niokhor</td>
<td>Head of the animal Production department at Thies university</td>
<td>Coordinate activities and teach</td>
<td>PhD and vet specialty</td>
<td>25</td>
</tr>
<tr>
<td>Diogoye</td>
<td>Teacher at the Thies university</td>
<td>Teach in the extension</td>
<td>PhD and Project manager</td>
<td>10</td>
</tr>
<tr>
<td>Dibokor</td>
<td>Extension agent</td>
<td>Implement extension activities</td>
<td>Under grade animal extension specialist</td>
<td>30</td>
</tr>
<tr>
<td>Adiouma</td>
<td>Teacher at the Thies university</td>
<td>Teach animal health in the extension</td>
<td>PhD candidate and vet specialty</td>
<td>10</td>
</tr>
<tr>
<td>Babacar</td>
<td>Extension agent</td>
<td>Implement extension activities</td>
<td>Under grade animal extension specialist</td>
<td>20</td>
</tr>
</tbody>
</table>

Parental influence, as well as personal and profession histories emerged as influential and key factors that affected part...
SODEVA extension institute until his retirement and had many activities to lead on the field and was always treated as a breeder parent or mentors, interaction and exposure to animals as an active youth in animal husbandry, being a breeder or a cart-driver at an early young age, all had positive and direct influence on Dibokor. Dibokor explained the influence of his father who was at the same time a public teacher at the primary level and breeder. Dibokor had activities in poultry and sheep productions, and sometimes he was a cart-driver. During this period, he was at primary and middle school, and his participation of the activities made him like animals and veterinary activities. He said that in order to explain the influence of parental relationships:

He continued by saying that after middle school he applied for a national animal husbandry school. In order to show the influence of parental relationships, in his decision to go to extension school. After secondary studies, well I told myself why - why not enroll in this sector which is really natural and real. This sector of animal husbandry which is really eternal through this school.
added that since his childhood, he always likes animals and was the herder of his father. While he was at the middle school, he learned that there is a school that focuses on livestock. He decide to do the training program to be in the animal husbandry extension system. He explained the role of the relationship and his love for animal had in his decision:

Continuing Professional Program for Animal Welfare in Bambey

In a context marked by the need to broadcast general animal husbandry information, and particularly with animal production and sales deemed as a priority in developing countries, it is essential to train and build the capacity of extension agents (Anderson & Feder, 2004). Capacity building of extension agents on new technologies concerning learning and knowledge management will allow them to combine during traditional meetings the electronic and social media communication tools such as Facebook, Skype, and Google Hang Out (Hansen et al., 2010; Ambrose et al., 2003; Root, 2003). These training sessions assume an identification of training needs, training content, educational resources to be mobilized, and elaboration of a training plan. Thus, training extension agents will improve their services to working animal owners who have a wide spectrum of demands ranging from animal health, animal production,
milk production to meat production, welfare animal, and pastoral production. Training of extension agents in these conditions furthers the effort to help achieve the objectives of modernization of agriculture in West Africa (Belay & Abebaw, 2004; Chizari & Karbasioun, 1998). Specifically training program in the Senegalese agricultural context will contribute to the training of agents to identify training needs, define training content, mobilize learning resources, and develop a training plans for farmers with different commodities or animals (Cafferella, & Daffron, 2013; Cervero, & Wilson, 2006; Caffarella, 2002).

Training program provided an opportunity for dialogue and a global perspective through the presence of participants from different regions of Senegal. It also allowed a better understanding of the challenges and opportunities for agricultural extension in other regions of the country (Cafferella, & Daffron, 2013; Cervero, & Wilson, 2006; Caffarella, 2002). This program and associated research will contributed to the implementation and consolidation of the positive program activities of our animal husbandry extension system through the training of educators responsible for its implementation. The training of extension educators is necessary to help them improve their performance in the transmission of new knowledge on practices, farming techniques, and new communication techniques. Thus, our program will help address this lack of training of extension educators in Senegal (Anderson & Feder, 2004; Scarborough et al., 1997).

A significant challenge in transferring agricultural knowledge and information to farmers has been the environment in which farmers and the agricultural extension system have had to operate (Bembridge, 1993). Indeed, there is a lack of knowledge and skills about caring for working animal because difficulties can be identified with extension professional, and owners and cart-drivers. Animal owners and cart-drivers generally seek only for earning income by working with them without unduly worrying about the time or the rest of the animal. Extension agents also
ignore generally the concept of animal welfare and its compound or did not have an update of knowledge about it, and faculty members give broad courses that brief or sporadically concern animal welfare. In addition, the difficult conditions of living for working animals are the result of a sum of lack of knowledge, skills and organization in the area (Burden et al., 2010).

The program process was formal and allowed researcher to easily maneuver where and how the instruction is going. And then, the formal process helped participants to identify, formulate clearly relevant welfare problems, and create educational programs (Caffarelle & Daffron, 2013). Writing and reaching consensus on the components and details of a welfare program can be a difficult and time-consuming process, particularly if the stakeholders have numerous priorities and level of powers. In addition, welfare program have many different components, all of which needed to be worked on based on the other activities. However, it is critically important to formally document the welfare program for transparency and consensus (Rong & Jia, 2008; Calixto & Lébre Larouvere, 2010).

Research question 1: How are agricultural extension programs currently taught, presented or offered for other owners of other animal species in the Diourbel and Thies regions of Senegal?

The first question of the study was designed to examine the existence and implementation of the current extension program for other animal species. The themes identified from the interview, focus group and the continuing professional education program implementation in response to this question included: job expectation and responsibilities, institutional and organizational factors, capacity building and professional development plans and recommendation for improvement. Indeed, the themes emerged for the current programs including poultry programs, cow and sheep fattening programs, the national vaccination campaign and artificial insemination programs.
Job expectation and responsibilities

The participants explained that their job expectation centered on the organizational mission and goals of extension within the current agricultural extension programs for other animal species. These job expectations included helping breeders with their problems, answering their own goals as extension agents or faculty members was giving people practical and simple solution that can be utilized by breeders to enhance the livelihood with their personal skills and local materials. Diogoye expressed that he had to address variety of areas in his workload in order to meet the expectations of his organization. While he is an extension agent in animal husbandry, he also had crop or agroforestry duties. So he said:"I had to work with two structures. The first one is the association for the développement de Sengala, où il y avait un volet élevage comme formation des auxiliaires."

Babacar thinks that he has the talent to work with producers since his professional background and responsibilities match an extension agent position. He is also comfortable with problem-solving and making a difference in behaviors, practices etc. To show the large rang of expectations, Babacar explains that he worked with different structures and partners in doing educational veterinary programs, management of local natural resources and vegetable gardening. Babacar described his experience with two partners and one national program:

Signifying that:"I had to work with two structures. The first one is the association for the..."
development of Sengala, where there was a livestock component such as training the veterinary assistants and agriculture component for the vegetable gardening and ... the natural resource management program where I had to work with the water department and forestry.

In addition, Niokhor explained the positions that he occupied to demonstrate the varieties of responsibilities and expectations in his workload within the extension system. All his positions that he managed were centered on a program. He was the manager of a regional area of the animal husbandry system for two years, then in the national office of animal husbandry and finally in the national center of artificial insemination for horses. Niokhor described his different responsibilities by saying:

Indicated to: I was at the livestock regional service of Kaolack, but after 2 years I went to the direction of breeding horse office and since then I was engaged in the extension system. First we had to supervise racing horse because it was the principal work of the direction frame the races and some support for producers, racehorse owners and other service providers. And then leading to another direction of breeding, I went to Sindia as Assistant to Country Manager and responsible for managing the hara for less than a year and then finally I went directly to the hara producing horses with artificial insemination, breeding and training for producers.

All participants had a good understanding idea of what involved as an agent with their job expectations in relation to the needs of breeders and programs that they are implementing or conducting.
Institutional and organizational factors

Organizational supports are crucial for job successes, and an emphasis that they need effective supports to accomplish their jobs in advising producers. Participants identified several problems in designing, implementing and evaluating extension programs. Mr. Babacar explained that difficulties such as limited local offices support of materials, equipment and no specific budget for extension activities for the local level affected their job particularly in implementing an educational program for fattening cows or artificial insemination. He said that:

Il faut bien équiper les agents en moyen logistiques, matériels, pédagogiques pour leur permettre de se déplacer sur le terrain pour la campagne de vaccination ou d’autres activités. After the vaccination campaign, if you have activities on the field, you need to buy your own fuel, to find the logistics and the equipment necessary for your activities on the field; because our budgets are practically suppressed from the national budget for animal promotion. The main support that we receive from the authorities is during the vaccination campaign.

Moussa illustrated the different types of factors which were beyond institutional and organizational issues. He explained the role and influence of authorities such as ministry and its staff on breeders, generally these relationships negatively affected extension agent work.

In relation to my field work, for example with the national vaccination campaign:
campaign we have the financial resources and material needed to follow, sensitize and train breeders. But at the end of the vaccination campaign, financial, logistical and material supports stop until the next vaccination campaign. After the vaccination campaign, if you have activities in the field you have to buy your own fuel, find the necessary logistics and material for your field activities and our budgets are practically deleted from the national budget for the animal extension system. The main support that we receive from the authorities is done during vaccination of animals.

Diarra displayed her feeling about having limited institutional supports for implementing programs. She emphasized that the problems could be found within the governmental authorities, because the extension authorities and agents often were forgotten in designing development policies. Also, the lack of budget increases overtime and funding from state and local authorities was inadequate to provide training opportunities for extension agents and breeders.

Meaning that: It is among the authorities that we find the problem. The agent is often forgotten in development policies. That is to say we do not give him the necessary supports to go in the field.

Moreover, Diogoye added an example from having support to move around the area of the county of under his responsibility during the national vaccination campaign. He said that

Representing that: As I can say for example if I take the case when I was in Banda, I stayed during 6 years without a bike for my field trips. I was obliged to go borrow somewhere a bike or motorcycle for my field trips within the breeders during the national vaccination campaign.
Niokhor explained that it is the responsibilities of the local or state authorities to bring the necessary supports for extension agents and offices, and create a new type networks between animal extension system and research in order to overcome the current limited network between them.

Indicating that and the Ministry or the state must put the accompanying measures to support the extension staff

Further, NGOs and the private sectors were important and contributed increasingly in the extension initiatives, but the level of cooperation with the public extension system is weak, explained a number of participants. Each of them had experienced at least one partnership project with NGOs and/or private sector organization in their position.

**Capacity building and Professional development Plans**

Capacity building and Professional development are the core of the extension development, because these efforts help to improve the knowledge of agriculture producers, and increase and refine skills of participants. To illustrate the needs of capacity building and Professional development plans, Diarra explained the urgent and regular needs of capacity building for extension agents in order to help them to be more productive in the field to implement current programs.

Niokhor touched on the same perspective on the necessity to update their teaching methods
and practices related to the current programs as stayed by Diarra by saying that formations de renforcement de capacité et de temps faire des recyclages faire de la formation des agents une priorité pour ameélorer leur méthodes de former.

Denoted to: doing capacity building training for agents that have a good career plan and occasionally organize retraining sessions for the rest of the agents making the formation of agents a priority to improve their teaching methods.

Furthermore, the ability to implement effective programs and develop leadership in the extension system could be obtained by attending in-service training, conferences and symposiums suggested Diogoye.

Signifying that the training sessions, conferences, symposia and advocacy at different levels I think these are the things that need to be developed.

Dibokor added that extension agents needed the newest knowledge on documents which could guarantee to get valuable knowledge and skills by asserting:

Organizing workshops with supporting documents which will serve as a base for our training sessions and sensitization of producers in the field. About the training topics, they will depend on the type of breeder e.g. poultry farmer needs training, the milk producer and also those who are bovine or sheep fattening. Even agricultural themes for fodder crops will allow farmers to be more productive and efficient.

Mr. Babacar focused on the pedagogical aspects of the capacity building and professional
development plans by telling the role of repeating training session. By toujours le renforcement pédagogique, il faut toujours inviter les agents à suivre des formations pour rappels. Meaning that: By always capacity building because it is always said that repetition is educational. As repetition is pedagogical, therefore it is still good to invite the officers to attend training sessions for reminders.

Adiouma complemented Dibokor by recognizing the importance of documentations from workshops to provide the basic services and training objectives. He affirmed that: des séminaires de formation qui vont nous servir de base et supports dans nos sessions de formation et de sensibilisation des producteurs sur le terrain. These documents will serve us as base and supports in our training sessions and sensitization of producers on the field.

All participants agree about the necessity of giving the extension agents the opportunities to have career improvement through capacity building. Capacity building for extension agents is crucial and critical problematic in improving the extension system.

**Diagnostic of the extension system**

Participants focused on several current programs for others animal species such as poultry programs, cow and sheep fattening programs, national vaccination campaign and artificial insemination programs to diagnose the extension system. Babacar travaillé sur des séminaires de formation qui vont nous servir de base et supports dans nos sessions de formation et de sensibilisation des producteurs sur le terrain.
He still used practice and demonstration in his teaching and training activities. This tell that: I do it through practice and demonstration. If you have your animal, we show you how - and well if there's excess what these excesses can create for your animal as problems good if there's excess what it can create such problems for your pet on poultry and technical fattening.

Also, he thought that using practice and demonstration in his context of teaching were the most effective and useful tools when working with illiterate people. In addition, he thought that theorize in the training session or workshop for illiterate producers is not relevant, and breeders in his context need more practical activities. That is why Babacar said:

La pratique, je pense que c'est la meilleure méthode. Je pense que c'est même mieux que de théoriser. Parce que l'homme qui n'a pas de lettres, s'il te donne des théories, il les oublie rapidement, mais tu lui montres par la pratique comment faire, et ça reste. Donc je pense que pratique est la meilleure méthode. Je pense que c'est même mieux que de théoriser.

Signifying that: Practice, I think that it is the best school. I think it's even better than to theorize. Because an illiterate person if you taught him theories he forgets it quickly, but if you demonstrated him in practice today and tomorrow it is fixed forever. So, I think that

Adiouma justified the importance of using practice and demonstration tools in his teaching duties by giving an example of his successful teaching program on feeding cows.

This indicates that: It is through the demonstration and practice that we are doing the extension of the treatment of straw with urea. What quantity of straw it will need to incorporate with salt or urea, for how long and when it is necessary to use it for animals by

60
Moussa discussed his practice and demonstration activities when he offered meat and milk production programs. He explained that producers appreciated the different training methods used to ameliorate the straw used as fodder in their goals for meat and milk production.

Although, Babacar added exchange visits as a method used to make behavior change for breeders by discovering new breeding and production methods. He experienced a good example of an exchange visit in Dakar:

Diarra related the necessity to do evaluation in the extension system and the level of application.

She talked about the needs to assess extension program and tools.
The evaluation after training I saw that this is a practice that must not be neglected and must be always applied at the level of farmers.

However, the results of the study showed lacks of teaching methods within the extension system. All participants recognized these insufficiencies in the teaching methods. Moussa talked about the extension agents weaknesses in expressing their needs. Babacar explained his difficulties to tell his weaknesses by saying that the only thing he can do was telling his needs and not his weaknesses, mes faiblesses, est-ce que je peux voir ou savoir mes faiblesses. Tout ce que je peux exprimer peut-être mes besoins.

Representing that my weaknesses is that I have weaknesses actually... is that I can see or know my weaknesses. All I can express is perhaps my needs.

Further, Adiouma lacked extension training techniques and methods and he explained this situation. "Techniques that I use to disseminate an extension theme aside from the demonstration I do not know other methods.

Dibokor said he had enough knowledge and skills about extension. Je ne crois pas. Peut-être que je ne connais pas le sujet de connaissance pour un bon agent de vulgarisation. Je ne suis pas tout à fait sûr de mes faiblesses sur ça ?

While Diogoye and Niokhor discussed about extension communication and their lack of knowledge and skills in this tool. They said: Je pense que nous avons les techniques de
Despite extension agents have programs for other animal species such as poultry programs, cow and sheep fattening programs, they show several lack of knowledge and skills in their teaching methods and communication.

**Regulations and legislations**

Concerning regulations and legislations for animal husbandry, all participants recognized that they have to do a lot to change the situation. They claimed that the country had several good regulations and legislations, but the application of these regulations and legislation still poses problem for the entire administration. Diarra mentioned a good point about the application in the extension system by accepting the impact of the lack of infrastructures, materials, funding and social live. She explained the case of rambling animals which are prohibited in the country, and its applicability pose problems.

Niokhor addressed in the same sense by giving another example to show the lack application of the regulation and legislation during the great campaign of vaccination.
cela ne fait pas.

Connoting that: The created laws must be applied, even if it is necessary to act through repression. It is shown for example during the vaccination campaign, normally during the campaign animal owner who does not vaccinate his animal must be denounced and sanctioned by the authorities. But it is not the case.

Research question 2: How do extension agents and animal management faculty members respond to experiencing participants focused teaching practices in their professional training?

Themes obtained through participant interview and the focus group were: there are limited sources of information for participants regarding student focused teaching practices. Participants expressed limited knowledge and skill of these practices, and relevant technology and useful methods of communication to apply in the classroom student focused teaching practices. All participants had a positive response to experiencing student focused teaching practices. They defined students as the target population of the extension system or students in animal production department. They also agreed about the teaching methods currently utilized in the animal extension system.

**Limited sources of information**

Dibokor reacted first by telling the most important feature about the practical and relevant experiences, developing participant independence and learning by doing. He argued that participants in the professional training are considered as faculty members and they are sources of skills and knowledge. In addition he always learned from them and facilitated positive responses and behavior.
Indicating that: On each traditional activity we do every day we learn something from this activity and every day we learn something. Either people or you learn something on the ground, facilitating the changes.

Moreover, the limited sources of information contributed significantly to the limited teaching practices methods. He explained that extension agents did not have the opportunity to access the newest practical teaching methods, so that sometimes it is difficult for them to appreciate behavioral changes. Il est difficile de comprendre les gens avec leur comportements dans la faune.

Niokhor discussed the importance of practical field experience in animal extension which is an influencing factor for the teaching practices for producers. Reasons for extension agents to fail in their teaching practices is having a lack of practical experiences. Diarra believed that having practical experiences is one of the best way to engage breeders to complement knowledge in their professional training. On le fait par la pratique et la démonstration. Si tu as ton animal, on te montre les besoins nécessaires en fourrage, en concentré. Et ce que ce peut lui créer comme problèmes de santé?

We do it through practice and demonstration. If you have your animal, you are shown the need for fodder, concentrates. And if there's excess what it can create it as health problems?

She also added that the lack of experiences could be the resultant of multiple factors such as personal motivation, job diversities and limited exposure to foreign experiences among others.
Limited knowledge and skills technologies

The extension extensions have an obsolete teaching practices and their professional training required an every update of knowledge and skills. Therefore, they need annual continuing professional education programs, but this is a big challenge for extension specialists to have good orientation, professional development plan and new teaching resources. Moussa said that to show their lack of their teaching practices:

"Peut-être que nous avons des nouvelles méthodes que nous ignorons, peut-être que nous avons d'autres méthodes que nous ne savons pas." Representing that "Maybe there are other new methods that I do not know regarding to vulgarizations."

Despite of these challenges, extension agents and animal management faculty members respond positively to experiencing student focused in their teaching practices defended by Babacar.

"Répondez et je complète si la réponse est incomplète. Mais vous aussi, quand avez des questions, n'hésitez pas à demander."

Signifying that "I am like you so it is an exchange we will do. I will ask you questions and you will answer, and I will complete if the answer is not complete. But you also, when you have questions do not hesitate to ask."

Diogoye talked about the integration and exposure to new exchange and sharing knowledges.

She said: "Si nous avons reçu des connaissances à l'université ou à l'école de formation et du parti de race, ces approches sont très différentes, alors nous étions obligés de prendre en compte ce paramètre et de formation, ce qui faisait que nous étions plutôt dans un milieu de partage où chacun apportait ce qu'il avait et il y avait un retour voir et de partage."

Meaning that: "The difference between the knowledge we have received at the university or in training school and breeders approach are very different approaches, so we were obliged to integrate..."
this parameter in the exchange and training session, which means that we were rather in a sharing environment where everyone brought what he knew. And in return everyone chose what interested him the most, and this has impacted too much my way of seeing and doing so far... It was something very positive.

Internships, research assistance and extension programs are possible solution for the limited knowledge and skills technologies defended by participants of planning program. Diarra mentioned the necessity to have diverse support systems to overcome the limited knowledge and skills technologies through new types of networks, partnerships, internal training session, field trips and university resources.

**Research question 3: How do extension educations in Senegal recommend student-centered teaching practices be used in the extension program?**

**Recommendation of student-centered**

In the third research question of the study, researcher examined the recommendation of student-centered teaching practices in the extension system. Participants, extension agents and faculty members, with different backgrounds, level of study, variety of experiences, and job position and responsibility were very engaged in sharing their experience and practices in order to apply student-centered teaching in their training sessions. Researchers noticed that the term student-centered was not a common used word by participants, and after brief definition and explanation all participants were confident to share their professional practices. Participants listed different student-centered teaching strategies that they experienced. They cited as examples of student-centered methods the conducting participant-led seminars, roundtable, analyzing visual image, group games, group discussion and think-pair-share. Diarra explained her history with the use of analyzing visual image in her training class. She said that I designed my class a way that participants were involved in class activities and at end of the activities
participants shared their opinion and understanding of the pictures. Telling that they formed groups between young and the old for that they analyze photos.

In addition, Mr. Babacar exhibited his used strategies in the classroom. He talked about assigning different roles of breeders in his class activities. Each breeders had a role in the classroom for doing activities.

Diogoye shared his experience by using demonstration strategy. I still used demonstration to address welfare for working animals and help student to identify the relevant information that could enhance the living condition for working animal. Moreover, Dibokor emphasized the roundtable discussion. His strategy was to help each table to choose a subject of discussion. The discussion started within the table before sharing ideas with tables and producers were always talkative.

Research question 4: How do extension educators and faculty members assist farmers in ensuring that accepted standard of welfare for animal husbandry are maintained including the care, feeding and physical wellbeing of domestic animals?

Standard welfare for animal husbandry

By doing a diagnostic of the animal husbandry system in their response to the fourth research question, participants discussed problems of welfare for working animal and the other animal species in the animal husbandry during the planning program for working animals. During these exchanges, several constraints were identified by participants, and among these constraints, they cited injuries caused by mistreatment of these animals or due to poor harnessing, health problems associated with recurrent diseases such as strangles, colic, laminitis, African Horse Sickness,
lack of control of certain pathologies, self-medication with veterinary products for the animals, working animals (Webster, 2005). Within participants, only Diarra had previous knowledge before she was hired in the extension system. That is why she said, by attending workshops organized by the world health welfare, she discovered the concept of animal welfare and gained knowledge and experience. 

Meaning that: Welfare was not a new concept for me because I had worked with world horse welfare which used this concept in their activities. I was somehow equipped on the working with the world horse welfare. I could give producers awareness themes. This passage really gave me the necessary tools to support and advise the producers. This is not the case for other extension agents who have never had to work on animal welfare.

Niokhor talked about his first experience on animal welfare. He explained that he was invited in a forum which focused on horse welfare by an NGO organization three years ago, and he was impressed by the importance of the theme and the necessity to apply the concept in the extension system. In order to clarify his opinion, he explained that the knowledge and responsibilities of horse owners and cart-drivers regarding animal welfare specifically for horses was very low and limited. If welfare of horses is included in the extension system, the knowledge from the users about how to properly handle and maintain the animals will be improved.
Indicating that: The knowledge and responsibility of horse owners and cart-drivers are very low and limits about the welfare of the working animals. If the welfare of horses is included in the extension system, they will be able to take into account the well-being in their everyday activities in the management and maintenance of horses.

Diogoye explained his first time to experiencing on animal welfare. He was applying for a job position for a project manager which focused on the working conditions and care for horses. Since this date, he was more conscientious about animal welfare. Diogoye said that:

The other participants recognized that they do not know or hear about animal welfare in the animal husbandry extension system. They do not have any experience or opportunities on animal welfare training sessions. Dibokor recognized that working animals must be treated in a good way to stay healthy, including proper feeding and housing. He explained the need of working animals by saying:

He added that the owners abused their animals because sometimes animals needed rest more when they were sick.
repos alors que ces animaux devraient être au repos signifiant que convalescence or receiving treatment are not laid to rest, while these animals should be at rest

However, the majority of participants agreed about applying animal welfare without knowing the concept of animal welfare. Both the head of the extension office and animal production department argued that animal welfare concept is something new for the extension agents and faculty members, but they always were applying and continue to apply it without doing so specifically. Although, Moussa talked about the responsibility of extension specialists to spread welfare concept and make mind shift for the stakeholders as they have to do when they attended a training session. He gave an example on poultry program.

Representing that As I had to do after receiving training, I came to popularize it in the field. I immediately saw the results. There are some who have begun to respect popularized themes. With the poultry program for example, they started building chicken coops, to treat animals, to give them to drink and feed them properly. This helped the breeders to improve their income

The majority of participants agree about applying the animal welfare in their daily work, despite they were never trained about the topic.

**Recommendation for acceptance and improvement standard animal welfare**

The discussion from the interview and focus group ended by a series of recommendations to maintain sustainable animal welfare in the animal husbandry system, improve the teaching method in the extension system, and capacity building of the extension agents and faculty members. The summary of these recommendations could be illustrated by Diarra and Niokhor. They explained capacity building for extension educators should be done, and introduced a new
target population from the primary and middle schools in order to make behavioral change
 overtime.

Renforcer la capacité des différents acteurs tels que les techniciens, les producteurs, les
autorités locales et les éducateurs pour renforcer les enfants sur le bien-être animal pour bien encrer ce concept dans leur esprit. Au niveau des jeunes sujets dans les
déroulé dans le cadre de la sensibilisation. Je crois que ça permettrait peut-être de faire
Signifying that:

Strengthen the capacity of different actors such as technicians, producers, local authorities
and also insist especially on the aspect strengthening children about animal welfare to anchor
this concept in their minds. At the level of children in primary schools, already these
concepts should be applied, and which in one way or another can be held as part of the
awareness. I think it will perhaps help to advance the application and consideration of
welfare.

Summary

This chapter discussed the results found from research questions: (1) to describe current
teaching methods for other owners of other animal species in the animal extension programs, (2)
to find the response of the extension agents and animal management faculty members through
their teaching practices, (3) to describe the use of the recommendation of student-centered
teaching practices and (4) to elucidate the assistance given to farmers in order to ensure accepted
standards of animal welfare in the animal husbandry system.
Chapter 5: DISCUSSION AND RECOMMENDATION

This descriptive case study examined ways to develop a set of recommendation in order to improve the educational program planning and teaching skills in the animal extension system. The researcher focused on animal welfare for working animals and extension education approaches to gather the investigation data. Interviews, document analysis, participant observations of a series of continuing educational workshops about program planning, and a focus group were used to gain an in-depth understanding of the challenge and opportunities faced by extension agents and faculty members involved in the animal husbandry extension system.

Four major questions guided this study:

1) How are agricultural extension programs currently taught, presented or offered for owners of other animal species in the Diourbel and Thies regions of Senegal?

2) How do extension agents and animal management faculty members respond to experiencing participants focused teaching practices in their professional training?

3) How do extension educations in Senegal recommend participant-centered teaching practices be used in extension program?

4) How do extension educators and faculty members assist farmers in ensuring that accepted standards of welfare for animal husbandry are maintained including the care, feeding and physical wellbeing of domestic animals?

The extension agents and faculty members involved in the animal husbandry extension system were the focus of this study. The discussion is presented by examining each of the different themes of the findings from the research questions.
Discussion

Parents and closer family still have a strong influence upon children on two significant life events such as marriage and career as defended by Larson (1995). This assertion corroborates the primary reason for participants of this study to choose to learn animal production and become involved in the animal husbandry extension system; the encouragement and influence they received from their parents, their own love for animal and their desires to help people. These findings also align with Ferry's (2006) claims that children that have been found to be the key roles in choosing career paths. In addition, the early contact with animal and parental network with animals were influential to become involved in the extension system. Personal histories also appeared as a factor that encouraged, because participants considered their parents as admired and respected role models, who helped them develop more confidence in their abilities to learn about available careers in the animal husbandry system.

Aspiring agricultural extension professionals must complete significant educational requirement to even be considered for positions hired by the state or private extension organizations. They are considered as specialist in extension methodology as well as technical knowledgeable and skills (Cooper & Graham, 2001; Levine, 2004). Academic histories and education levels of the participants show not only the diversity of the level of studied and degrees, but also indicate that the participants of the study were well-educated in animal sciences and agricultural extension education with a bachelor or graduate level in animal sciences and rural development. Therefore, they are capable of apply their knowledge in practice and ensure effective performance in extension work (De Beers, 2000; Cooper & Graham, 2001; Levine,
2004). The number of years of experience in the extension system possessed by participants indicated that extension agents and faculty members in this study had a good experience being involved in the extension system. Indeed, the number of years of experience held by participants helped them to consider each educational situation individually and adopt a position or role suitable to that particular situation.

All participants had more than one position and/or role within the extension system and those varied from administrative to technical responsibilities. These results support the person-fit paradigm which required the match between job-demand and personal skills and knowledge (Chan, 2005; Anderson et al., 2004). The varied positions and roles played by participants in the animal husbandry extension system showed their well-experienced (Koundinya, 2010; Kwaw-Mensah, 2008; Jayaratne, 2001), and allowed them to provide service to the agricultural community by focusing on expectations. The varied positions occupied and roles played by participants in the animal husbandry extension system were relevant characteristics showed by the results of the study.

All participants have a good experiences in the animal husbandry extension system as an educator, and have a good understanding of the nature of extension work as centered on producers. Therefore, they have the abilities to do the job, provide services to the community and help producers to solve problems (Dalton et al., 1977). The findings showed that participants were assigned more than one areas of responsibility as explained by Diogoye who explained that he faced a variety of areas in his workloads in order to meet the expectations of his organization which needs to provide relevant services to the community (Ensle, 2005, Ragasa et al., 2013). While, he is an extension agent in animal husbandry, he also had crop or agroforestry duties, and these varieties of duties attract him to remain in the extension system. As a group the extension
agents and educators are busy with many responsibilities. Despite of the variety of responsibilities, participants were very enthusiastic to serve breeders by focusing on the desire to help them solve problems. Niokhor described the different responsibilities that he occupied before his current position. He discussed the varieties of responsibilities and expectations in his workloads: first as technician in animal health and production, then as provincial veterinarian for three years, then in the national office of animal husbandry and finally in the national center of animal production. The participants talked about the need to clarify and state job expectations at the entry level of the extension system, so that extension agents will be able to better serve the breeder community and assist them in solving problems efficiently. Indeed, the lack of clear stated job expectations indicated by participants could be a source of conflict of interests between extension agent expectations and organization expectations. As the government works to increase the number of extension professionals, it will be important to not only expect them to efficiently work with breeders and provide them with clearly stated job expectations, but also to ensure that these professionals are equipped with current extension skills and knowledge. In order to accomplish their jobs, extension agents need more financial, technical and effective organizational networks, because inadequate infrastructure and organization are the roots of the main extension problems. These results corroborated with Burke and Litwin (1992) model to solve problems and explain organizational performance and innovation. The model suggested to diagnose where problems exist in the organization and what appropriate solutions are required for improvement and organization change. These factors were supported by the career stages model defined by Kutilek et al., (2002). The lack of budgets from state and local authorities raised the inefficacy of designing, implementing and evaluating extension programs.
as explained by Niokhor and Diarra. Indeed, the availability of funding and the institutional networks involved in its delivery are important for extension success. The needed technical supports from local offices include access to materials and equipment necessary to increase the level of involvement of both the agents and breeders in varieties of provided programs. The negative social networks in which various authorities often have conflicting expectations of breeders has a negative impact in the extension system as explained by Moussa:

"Paternalism of the authorities in relation to the producers with whom they have obligations without expecting anything from them in terms of回报。The extension system can be further strengthened by developing partnerships between government, non-government and development organizations, and private sectors. These partnerships are vital for extension organization according to Biradar et al., (2006), as they can gain more benefit collectively than by working individually.

Studies have shown the need of continuous professional development for extension agents, clarity on the extension profile, role and responsibilities ((Dromgoole, 2007; karbasion, et al., 2007; Chandler, 2004). Background, level of experiences and program areas dictate and impact the professional development needs of extension professionals. The results from the research process revealed the urgent needs for capacity building, because several factors such as limited funding, absence of current training programs and curriculum do not promote opportunities for capacity building and professional development plans in the goals to improve knowledge, and increase skills (Garst et al., 2007; Squire, 2003). The findings aligned with the purpose of the demonstration of high level of professional competence which is the primary justification for the extension service successes as defended by Strother (1977). The findings supported the assertions that..."
the professional competences of its members, as they are a valuable asset of an organization. Moreover, participants recognized the importance to attend workshops, documentations in-service training, conferences and symposiums. Therefore, government and local authorities need to pursue an active and continuous professional development program plan including all agents at all level in order to allow them to study higher level skill and knowledge for improved programming as well promotion. Participants found that limited sources of information negatively impacted their teaching methods because of a limited access to the newest practical teaching information. As Diogoye explained about the need for integrating and exposing extension agents to new type of interchange, sharing knowledge and skills with advanced extension systems.

The participants identified several programs that are currently taught, presented and offered for other animal species such as a poultry program, a cow and sheep fattening program, and an artificial insemination program. These programs show that the extension system offers opportunities for breeders to improve their livelihood by having new and practical activities as Mr. Babacar said. However, participants of the study still used practice and demonstration in their teaching and learning program activities. In addition, participants agree about the effectiveness of demonstration, group discussion and question-answer teaching methods for illiterate people. These results are similar to those reported by Shinn (1997). However, participants thought that discussion of theories in the training session in a formal workshop for illiterate producers is not relevant, and breeders in this context need more practical activities as justified by Adiouma in term of the importance of using practice and demonstration tools in their teaching duties. He provided the example of his successful teaching program about feeding cows, where he
démonstration et la pratique que nous faisons cette vulgarisation du traitement de la paille à
pendu
This indicates that: It is through the demonstration and practice that we are doing the extension training for the treatment of straw with urea. What quantity of straw it will need to incorporate with salt or urea, for how long and when it is necessary to use it for animals by for example by digging... 

Participants support practice and demonstration teaching methods while expressing their need for student-centered strategies which are vital for the extension system as emphasized by Diarra and Niokhor.

The findings showed that participants agree to the urgent need to modernize regulations and legislations to change the situation. They defended that the country had several good regulations and legislation, but the application of these regulations and legislation still poses problem for the entire administration. Modernizing regulations and legislations for effective and efficient control require good governance and appropriate legislation for the animal husbandry system. Also, changing the regulations and legislation should be accompanied by the reinforcement of infrastructure, materials and financial resources as Diarra explained. She said that case of rambling animals which are prohibited in the country, its applicability pose problems because of the lack of adequate infrastructures to keep animals in confined areas. In addition, capacity building programs on basic welfare issues for public security services could be done, however
there is a need to reinforce extension agent's authority in applying regulations by implementing these security services.

Participants discussed welfare for animal husbandry for both small and large ruminants, working animals and poultry. They chose to focus the discussion on the health, treatment and dietary resources of working animals. For the health constraint, they talked about current diseases such as African Horse Sickness, colic and laminitis, about the treatment, they mentioned injuries from poor harnesses, hard work and limited rests. The findings corroborate with Webster (1994) assertion of the critical importance of good welfare that include proper housing, as well good health and feeding practices. The results shows that the majority of participants did not know the concept of animal welfare, however they are applying practices that support animal welfare. Participants lacked an understanding of the concept of animal welfare, because they do not have any experience or opportunities for animal welfare training sessions. Additionally, the findings reveal an ineffective animal welfare application program by the public extension agents focusing on the five freedoms (Noordhuizen & Metz, 2005). This means that they have to advise and sensitize producers to understand animal welfare and the basic welfare issues such as: animal welfare and dairy production, animal welfare and feeding, animal welfare and sustainable animal know that they can do it and help them do it. Then they must help animal owners understand the link between income and animal welfare, and quality of animal products and animal welfare. Consequently, extension agents and faculty members need capacity building and training sessions on animal welfare because it is a new concept and it is necessary to understand this concept.
Conclusion

All participants received a variety of influences to enter in the extension system, and these influences center around parental, personal, profession and educational level. They also are well-experienced with at least one academic degree in animal husbandry and veterinary science. This means that extension agents and faculty members represent a spectrum of academic experience. Also, extension educators had a positive attitude about sustainable animal welfare and were ready to attend animal welfare educational programs, so that they will be able to build training surjp voj kdes hiddj kfhv up cghv oq hnhbroc# preparing participant-led workshops, conducting participant-led seminars, roundtable, analyzing visual image, group games, think-pair-share, and group discussions were considered as an effective student-centered teaching methods, but student-centered was not a commonly used term by participants in the extension system.

Professional commitment, technical competency and job satisfaction were important factors that influence behaviors in responding to missions and extension goals. The lack of capacity building programs and professional advancements did not discourage participants to remain in the extension system, but proved the lack of teaching methods established in the extension system. However, offering career opportunities with capacity building lead to develop organizational promotion and improve the extension system. Therefore, it is crucial to create career and professional development plans for agents within each stage that includes the necessary individual and organizational supports.

Major constraints identified by participants in animal welfare focused on mistreatment, animal mental and physical health, and abuse from inappropriate work activities. As changes in the extension system remain problematic and needs urgent solutions in order to improve the
welfare of animals. Animal welfare and its compounds are a new concept in the local extension, therefore participants need to attend training program in order to be efficient in spreading the concept and changing the mindset as well as behaviors of breeders.

**Recommendations**

The following recommendations are based on the finding and conclusions of this descriptive case study:

1. **Continuing professional development programs**

   Programs are needed in order to cover broader skills applicable locally by extension professionals to better serve farmers by providing necessary technical support and capacity building programs. Also, continuing professional development programs should be introduce in the extension system, because extension agents need better training in a varied number of dimensions through participatory approaches in order to improve their professional development plans. These educational programs should be short and long term training to enhance extension methods and tools for farmers, and entrepreneurial and management skills. In addition, continuing professional development programs should be equitable opportunities for both new and experienced extension professionals in the extension system with the goal to give extension educators opportunities to continue to develop their skills, conduct effective research programs, and share learning experiences. In the process of increasing their educational level, extension professionals will increase their technical competences and learn more up-to-date technical knowledge and skills to address their needs and better the extension system.

2. **Increasing finances**
The limited financial resources negatively impact the extension system, consequently findings has to be increase in order to improve work qualities and outreach in an effective and efficient ways to enhance rural livelihood. In addition, the financial resources should be under their direct control to provide and implement requested and needed extension programs. Finally, extension agents should play a fundamental role in facilitating credit to producers from public sector or public-private partnerships.

3. **Improving linkages throughout the system**

This study shows the importance of linkages between extension system, public and private sectors and research system. In order to promote extension activities and develop collaborative strategies, it is urgent to build sustainable networks between university, research and extension system. This linkage needs to be improved, thereby producers can receive information and support including practical activities, ameliorating access to research information in general and needs. In addition, this link should ensure that all actors from the extension system and research do a good job.

4. **Hiring qualified and motivated extension agents**

Good extension programs do not yield positive outcomes unless they are executed by a qualified, motivated and energetic staff, thereby local authorities and government should hire qualified extension agents to address the needs of breeders and apply best practices in the extension service. Indeed, strong motivation and competences are critical to the extension delivery of knowledge, skills and field experiences to producers, and can also impact positively do a good job.
5. Facilitating access to research information

Research data and appropriate delivery systems should be designed to match and help educators to better communicate with producers, and to enhance the educational process. The network between extension system and research system will permit centralize information and documentation the professionals in extension system need to integrate into their education programs. Develop a document that will help to identify roles and expectations for communication and interaction between agents and specialists in extension system and partners. Resource centers should be built to help extension agents to come to obtain the updated information.

6. Focusing on animal welfare for a sustainable agriculture and breeding system

It is necessary to appreciate extension work and develop knowledgeable technical competencies for the major farming and breeding systems such as administration, training materials and tools, technical information, internet tools and access, and economics. Thereby, faculty members should design courses and curriculum focusing on animal welfare for the future extension agents. Acceptable working conditions for animals and innovative livestock management practices should be identified as important educational activities in order to improve the agricultural education system. Hence, it is recommended that continuing professional educational programs be offered to emphasis planning processes such as need assessment, program planning, learning and delivery methods, and evaluation systems for animal extension professionals.

Recommendation for further research

This study found the following potential research areas that need to be addressed by further research:
1. The study needs to be replicated in other Senegalese regions, because the purpose of study requires more detailed investigations, so that different perspectives could emerge and validate this study. Also, this study should be replicated with agricultural extension educators in the view of the large spectrum of job expectations of the extensions agents in order to invest and identify their perception of animal welfare. In addition, the identification of other educational areas which could strength the extension system should be carry out in order to cover extension professionals. The extension professionals could then offer greater overall coverage in the growing diversity of extension services in different sectors and needs for producers.

2. A study should be carry out to examine the various organizational factors, structural, political, and human resources that affect the educational program and professional development as suggested by Cervero and Wilson (2006). Indeed, educational programs and professional development planning are an ongoing social activities as argued by Cervero and Wilson where interests of people are causally related to the produced educational programs by negotiating personal social, organizational and power. This will ensure an effective and efficient management of both physical and human resources in the extension system.

3. A study of extension educators regarding their perceptions about appropriate teaching methods should be conducted to identify preferred teaching methods and barriers to teaching about sustainable extension systems. Indeed, extension delivery services are facing various questions such as efficiency and technical competency possessed by extension agents to execute extension programs because of the different competency needs. In addition, research should continue to develop improve curriculum regarding
attitudes toward farm animal welfare related to appropriate teaching methods and strategies in order to acquire high levels of program impacts. Further study is required to enhance understanding of the specific practices that promote greater concern for working animals in the animal husbandry system by extension professionals and researchers. By improving the understanding of these practices, it will help to develop more effective policy measures for advancing animal welfare. Extension professionals have an important role to play in reaching this goal.

4. A study of the factors influencing capacity building for livestock development should be carried out to identify strategies to improve training outcomes for rural development in Senegal. Understanding how extension professionals are doing their respective activities and whether they have perceived the needs for additional training remains crucial in order to develop a sustainable and innovative extension system. Furthermore, the importance of capacity building for livestock education including technical and professional competences regarding livestock management. Repeated researcher processes could allow participants to indicate specific motivation, job expectations, job satisfaction in their future participation in a same study. Also, it is recommended to replicate the study by comparing the perception of animal science faculty members and extension agents in service in the various regions of Senegal regarding the animal welfare concepts. Analyzing the different welfare factors in the formation of attitudes toward animals should call for the inclusion of different level of perceptions, motivation and skills to improve these factors in educational animal husbandry systems.

5. A study of the factors influencing capacity building for livestock development should be carried out to identify strategies to improve training outcomes for rural development in Senegal. Understanding how extension professionals are doing their respective activities and whether they have perceived the needs for additional training remains crucial in order to develop a sustainable and innovative extension system. Furthermore, the importance of capacity building for livestock education including technical and professional
competencies is uncontested because of different perceptions of their competencies by extension professionals.

**Implication and educational significance of the study**

This descriptive case study examined ways to develop a set of recommendations to improve the educational program planning and teaching skills of educators by focusing on animal welfare for working animals. Findings can be generalized only within the Diourbel region where Bambey is subdivision of Senegal. This study may have implication that can include planning and implementing educational programs focused on sustainable animal husbandry. Therefore, it is necessary to develop well designed educational programs that align with the interests. According to this study, animal welfare concepts and student-centered teaching methods were ambiguous and confusing terms for participants. This implies the need for clarifying these terms in order to help educators develop acceptable definitions of animal welfare concept and student-centered teaching practices. Therefore, it is essential to design a favorable learning environment for participants to develop positive perception toward sustainable animal husbandry system. The participants had positive perceptions regarding the educational process, but had a negative opinion about the professional development competencies identified in this study. Indeed this opinion is the result of the challenging possibilities and opportunities to improve extension educator competencies in communication through a continuing professional education experience that includes current animal welfare teaching strategies and application of the legislation. Further, the blocking factors of political powers lead to an extension system that is not very efficient.
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Appendix A: Consent Form Script

Consent Form Script

Investigators: Oromoue Keo, Donna Westfall-Hnati

The purpose of this research will be to provide a greater understanding of welfare for the working animals and develop a set of recommendations to improve the extension education programs for farm workers and teachers across the District and Tha region. The results of this study will be published and used for a graduate thesis.

I would like to invite you to participate in a study of ways to expand the animal welfare component of the extension system about the process of identifying technical plans to improve the extension system. The study will focus on animal welfare to develop a set of recommendations to reach the objectives of the study.

By participating in this study, you will be offered to participate in an interview, focus group, and in the program planning. Participants are a one-on-one interview where you will be asked questions about your experiences, knowledge, and skills in teaching farmers and implementing the extension programs, and in a focus group where extension agents and teachers will discuss the improvement of the animal husbandry extension system.

I am planning to audio-record and transcribe each interview and the focus group. Taking part in this study is completely voluntary and confidential, and you may choose to refuse from participating in the interviews now or at any time in the future. The interviews and focus group will be length approximately 60 to 90 min each.

Please ask any questions you have now. If you have questions later, you may contact Oromoue Keo at oromoue@vt.edu or +1 540-432-3831 or Donna Moore at donna.moore@vt.edu or +1 540-231-6715.

Should you have any questions or concerns about the study or your rights as a research subject, or need to report a research-related injury or event, you may contact the VT IRB Chair, Dr. David M. Moore at donna.moore@vt.edu or +1 540-231-6608.
Appendix B: Informed Consent Form

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
Informed Consent for participants in Human Subjects Research

Title: Ways to expand the animal welfare in the extension system in Tissi and Bambey, Senegal: A Case Study Approach

Investigator: Osuamueh Kass, Donna Westfall-Redd

I Purpose of this Research
The research will be conducted to provide a greater understanding of welfare for the working animal and will help to develop a set of recommendations to improve the extension education programs for the extension workers and university staff in the Bissau and Tissi regions. The results of the study will be published and used for a graduate thesis.

II Procedure:
You are invited to take part in a research study focused on the extension system improvement for workers and extension agents. We are asking you to take part because you are a member of the extension system, teachers who involve in the extension system. If you agree to take part in the study, you will be asked to participate in an audio-recorded interview and focus group that will help us examine the themes developed from the analysis of the interviews. Participants will be observed in extension team meetings and additional educational training programs as part of study participation. Notes will be taken for the observation process. The interview and focus group will be about 60-90 minutes and will be audio-recorded.

III Risks
We do not anticipate any risks for you participating in this study, other than those encountered in everyday life.

IV Benefits
The study will not have any direct benefits for you, but your participation will help us learn more about how extension professionals can enhance the system.

V Exemption of Anonymity and Confidentiality
In any written publications, the researcher will not include any information that could make it possible to identify you. The transcriptions of the interviews will be kept in a locked file. Only the researcher will have access to this tape. The written transcript of the observations and electronic file will also be kept secure. This consent form will be stored in a locked file separately from the tape and transcript. An alias will be used during the interviews rather than your real name.

VI Compensation
There will be no compensation for your participation in this study.

VII Freedom to Withdraw
Taking part in this study is completely voluntary. You may choose to refuse from participating in the interview now or at any time in the future. If you decide not to take part in the interview now or at any time, your refusal will not affect your current or future relationship with Virginia Tech University. If you decide to take part, you are free to withdraw at any time.

VIII Subject’s Responsibilities
Taking part in this study is completely voluntary and I agree and accept to participate in the study. I have the following responsibilities:

- Participation in a 60-90 minutes interview and focus group.
- Ask questions of the researcher about the study at any time.

IN SUBJECT’S PERMISSION

I have read the consent form and conditions of this project. I have all my questions answered. I am not a minor and
my voluntary consent to participate in this study.

Please ask any questions you have now. If you have questions later, you may contact Osama Hane at
consent@vt.edu or +1-540-445-3613 or Donnet Weisheit-Ridd of amsalem@vt.edu or +1-540-231-3737.

If you have any questions or concerns regarding your rights as a subject in this study, you may contact the
Institutional Review Board for Human Participants (IRB), Dr. David M. Hines at +1-540-231-3737 or
amosalem@vt.edu

You will be given a copy of this form to keep for your records.

Statement of Consent: I have read the above information, and have received answers to any questions I asked. I
consent to take part in the study.

I understand that the interview will be audio taped.

Your Signature __________________________ Date __________________________

This consent form will be kept by the researcher for at least three years beyond the end of the study and was
approved by the IRB on.
Appendix C: Informed Consent Form in French

Formulaires de consentement pour participer aux interviews du Programme de Recherche sur "Éducation Extensive"

Titre: Mayonnais d’Alsace le bien-être animal dans le système de vulgarisation à Thies et Bignona, Sénégal. Une approche d’étude de cas

Vous êtes invité à participer à une étude de recherche axée sur l’assistance de consommateurs et les agents de vulgarisation. Nous vous demandons de prendre part à cette étude pour suivre un ensemble de systèmes de vulgarisation, des agents et des professionnels du système de vulgarisation. Cela a pour but d’améliorer la communication et de poser toutes les questions que vous pourriez avoir avant d’accepter de participer à cette étude.

Sur quoi porte cette étude. Le but de l’étude est de développer un ensemble de recommandations visant à améliorer les programmes d’éducation du conseil agricole et rural pour les producteurs, les agents de l’État et le personnel enseignant dans les régions de Dinard et Thies. Vous devrez faire partie du groupe de recherche afin de prendre part à cette étude.

C’est qu’un-vous demandez de faire. Si vous acceptez de participer à cette étude, vous serez invité à participer aux interviews qui nous aideront à comprendre les différents aspects de la participation aux programmes d’éducation du conseil agricole et rural dans le système de vulgarisation agricole.

Les risques et les avantages. Nous ne prévoyons pas de risques pour vous en participant à cette étude, même que celles rencontrées dans la vie courante. L’étude n’a pas d’impact direct pour vous, mais votre contribution nous aider à en apprendre davantage sur le fonctionnement des professionnels du conseil agricole et rural dans le système de vulgarisation agricole.

Précaution et communications. Il n’y aura pas de précauteur ou communications pour votre participation à cette étude.

Participation volontaire. Prenez part à cette étude est entièrement volontaire. Vous pouvez choisir de ne pas participer aux entrevues ou à l’entièreté de l’tout même si vous décidez de ne pas prendre part à l’étude, votre consentement sera pris en compte et votre information sera gardée en strict confidentialité.

Confidentialité. Un pseudonyme sera utilisé lors des entrevues pour protéger votre identité. Les informations relatives à l’identité des interviewés, des observations et fichiers sera gardé en strict confidentialité. Ce formulaire de consentement sera stocké dans un fichier sécurisé avec les informations sur les personnes interviewées et les documents manuscrits.
Si vous avez des questions, le chercheur principal de cette étude est Onassissi Kasse. Vous pouvez poser toutes les questions que vous avez maintenant. Si vous avez des questions plus tard, vous pouvez communiquer avec Onassissi Kasse au ona@vri.be ou +221 77 690 63 68 ou Dormus Moune au mdormus@vri.be ou +1 828 330 28 01. Si vous avez des questions ou des préoccupations concernant vos droits en tant que sujet dans cette étude, vous pouvez communiquer avec le Conseil international d'éthique pour les participants humains (CEIR) qui est le bureau de régulation éthique de la recherche en États-Unis. Ce Conseil est au 1300 22 2222 ou 800 422 2222.

Vous recevrez une copie de ce formulaire à conserver pour votre information personnelle.

Délivrer une copie à votre famille et à votre médecin si vous souhaitez que les informations ci-dessus soient transmises à d'autres personnes. Je consens à participer à l'étude.

Je comprends que l'intervenant sera enregistré (e).

Nom et Prénom: ________________________________________________________________

Signature: ____________________________________ Date: ________________

Ce formulaire de consentement sera conservé par le chercheur pendant au moins trois ans en dehors de la fin de l'étude et est approuvé par le Conseil international d'éthique pour les participants humains (CEIR) qui est le bureau de régulation éthique de la recherche en États-Unis.
Appendix D: Invitation Letter

Invitation Letter to participants in the Study

Dear

You have been identified as a resource for your work in the extension system and teaching process. Because of your knowledge, experiences and skills about the implementation and training process in the extension system, I believe you can provide meaningful and accurate information regarding your involvement and work in the development of the extension system. Your role in the extension system and relationship with farmers offer opportunities and perspectives that are unique to many issues and subjects related to extension improvement and capacity building.

Therefore, I would like to ask you to participate in a study of ways to expand the animal welfare component in the extension system about the process of identifying strategic plan to improve the extension system by focusing on animal welfare. By participating in this study your commitment would consist of an interview, focus group and attend in the program planning. As a participant you will be asked to:

- Participate in a one-on-one interview where you will be asked questions about your experiences, knowledge and skills in teaching farmers and implementing the extension programs, approximately 1 hour. I am planning to audio-record and transcribe each of the interviews.
- Participate in a focus group with other extension agents and teachers discussing the improvement of the animal husbandry extension system, approximately 1 hour. I am planning to audio-record and transcribe the focus group.
- Participate in the implementation of a program planning for teachers and extension agents.

I am really interested and excited about the opportunity you give me to learn about your experiences and perspective about the implementation and improvement of the animal extension system. It is very important to me that you feel that the time you give to participating in the study is time well spent, and will be of benefit to you. I can finish any request without needing you for your willingness to help me out with my study of ways to expand the animal...
workflow component in the extension system after you accepted to meet with me and discuss the purpose and overview of the study. If you are interested in setting up a time to interview or would like more information about this study after our first meeting, please feel free to contact me. I am looking forward to meeting with you on [date] for our interview. If that is not going to be convenient for you, please give me a call at +221 77 509 65 58 (local number) or email me on [email address].

Sincerely,
Appendix E: French Invitation Letter

Lettre d'invitation

Cher Participant,

Vous avez été identifié comme une personne ressource à cause de votre travail dans le
système de vulgarisation animale et le processus d'enseignement. Grâce à vos connaissances, vos
expériences et vos compétences dans la mise en œuvre et le processus de formation dans le
système de vulgarisation, je crois que vous pouvez fournir des informations significatives et
essentielles concernant votre implication et le travail dans le développement du système de
vulgarisation. Vous êtes dans le système de vulgarisation et des relations avec les agriculteurs
offrent des perspectives et des perspectives uniques que vous pouvez répondre aux nombreux
questions et des sujets liés à l'amélioration de la vulgarisation et les actualisations de capacité.

Par conséquent, je vous demande de participer à une étude sur les moyens utilisés
pour diffuser les connaissances du bien-être animal dans le système de vulgarisation et sur le
processus d'identification de plus stratégique pour améliorer le système d'enseignement en se basant
sur le texte des manuels. En participant à cette étude, vous serez amené à être
interviewé et participez à un forum groupe avec les autres participants de cette étude. Vous serez
aussi appelé à participer dans un séminaire de formation de renforcement de capacité.

L'interview et le forum groupe se tiendront de manière 1 heure et 30 minutes et ils seront
sensibilisés pour les besoins de cette étude. Je vais cependant montrer une forme à propos de
l'occasion que vous me donnez à apprécier de votre expérience et de la perspective de la mise au
marché et de l'amélioration du système de vulgarisation récapitulatifs.

Je ne peux terminer ma demande sans vous remercier pour votre volonté de participer dans
l'étude. Si vous êtes intéressé pour la mise en place des interviews ou si vous souhaitez
plus d'informations sur cette étude après notre première rencontre, vous pouvez contacter moi. Si
l'heure de rendez-vous fixée n'est pas pratique pour vous aussi, vous pouvez me contacter au
+221 77 056 63 58 (numéro local) ou envoyer un mail sur commune@vt.edu.

Coûteusement

Page 1 de 1
Appendix F: Recruitment Materials

The researchers will include extension specialists involved in the animal husbandry extension and teaching system in Tuba and Dusafel. The researchers will discuss first with the heads of the Department of Animal Production and Extension offices in order to identify potential participants of the research process. The researchers will provide them with a general overview of the study and draft of the data collection protocol and consent forms. Once approval is granted by these authorities, initial contact will be made by phone, Skype or Google Hangout to call the participants. After that, the researchers will meet individually with the potential participants to discuss the purpose and overview of the study in order to invite them to participate in the study. In order to formalize these discussions, individual invitations will be sent to the participants. All teachers and extension agents who accept to involve in the study will be chosen as a simple, and will be asked to participate in the interviews, focus group and program planning.

The participants selected for the study will be the extension agents and teachers from the extension office and department of animal production. The expected rich information that can be gathered at data and their relevant experiences will be the main reason why the group will be chosen to participate in the study. The process of this study will be individual instruction. We will use the French language for all discussions with the participants and the consent forms will be translated to French. By using French as the language of work, it will help us to avoid misunderstandings because all participants can read and understand the French language. Before signing the consent form, we will explain the importance of the consent form for participants and why it is essential for participants to have a copy so that they can keep for their personal information.
Recrutement

Les chercheurs comprennent des spécialistes impliqués dans le système de vulgarisation et la formation des agents de vulgarisation au niveau d'Ihalé et Dovebé. Les chercheurs veulent discuter d'abord avec les chefs de département des productions animales et des services de vulgarisation animale afin d'identifier les potentiels participants du processus de recherche. Les chercheurs fourniront ces chefs d'unité un formulaire d'inscription pour la participation des agents et des enseignants sélectionnés. Une fois l'inscription acceptée par ces enseignants, un premier contact sera fait par téléphone, Skype ou Google Hang out pour appeler à la participation. Après cela, les chercheurs vont rencontrer individuellement les potentiels participants pour discuter de l'objectif et la vue d'ensemble de l'étude afin de les inviter à participer à l'étude. Afin de formaliser ces discussions, une invitation individuelle sera envoyée à chaque participant. Tous les enseignants et les agents de vulgarisation qui accepteront de participer à l'étude seront choisis et invités à participer à l'étude.

Les participants sélectionnés pour l'étude seront les agents de vulgarisation et des enseignants du département des productions animales engagés dans le système de vulgarisation animale. L'information et les informations pertinentes qui peuvent être collectées à leur niveau, seront les principales raisons pour lesquelles ce groupe de personne sera choisi pour participer à cette étude. Le recrutement pour cette étude se ferait avec une invitation individuelle. Nous allons utiliser la langue française pour toutes discussions avec les participants et les formulaires de consentement seront traduits en français. En utilisant la langue française comme langue de travail, il nous aidera à éviter certains malentendus parmi que tous les participants peuvent lire et comprendre la langue française. Avant de signer un formulaire de consentement, nous allons leur expliquer l'importance du formulaire de consentement pour les participants et pourquoi il est essentiel pour eux d'avoir une copie qu'ils doivent garder pour leur information personnelle.
Appendix I: Focus Group Protocol

Focus Group Protocol: Ways to expand animal welfare in the animal husbandry extension system

The focus group moderator will follow a standard protocol for each session that includes:
- Questions and answers period
- Wrap-up

Participants for the program planning of the expansion of Animal Welfare will be encouraged to identify, clarify and prioritize its animal welfare interests and common objectives for the improvement by using a combination of resource-based and workshops.

Focus Group Questions:
Let’s quickly go around the table and share a few facts so that we all can understand the make-up of our group.

Faisons rapidement un tour de table et partageons quelques faits afin que nous puissions tous comprendre la composition de notre groupe:

a. Round table of presentation.

Tour de table pour la présentation des participants:

b. How long have you been in the extension system or education system?

Depuis combien de temps êtes-vous dans la vulgarisation ou l'enseignement?

c. What is your role function in the extension system or education system?

Quelle est votre rôle dans la vulgarisation ou l'enseignement?
• Working animal and welfare

1. Do you participate in 'pre-packaged animal welfare programs' delivered by other government agencies or animal welfare organizations (e.g. Project, NGOs, schools education program, Animal Club etc.)?
Participez-vous à des programmes de bien-être animaux fournis par d'autres organismes gouvernementaux ou des organisations de protection des animaux (e.g. Project, NGOs, schools education program, Animal Club etc.)?
- If so, how have these programs been helpful for your work with farmers?
Si oui, comment ont-ils été utiles pour votre travail avec les agriculteurs?
- How have these been any challenges in working with these programs?
Y a-t-il eu des difficultés à travailler avec ces programmes?
- If so, what type of assistance might help you work through these challenges?
Si oui, quel type d’assistance pourrait vous aider à relever ces défis?

2. Are you aware of these animal welfare programs?
Étes-vous au courant de ces programmes de protection des animaux?
- If you are aware, are there any particular reasons why you are not using them?
Si vous êtes au courant, y a-t-il des raisons particulières pour lesquelles vous ne les utilisez pas?
- Are you aware of other schools/teachers/extension agents who participate in animal welfare programs or who teach or impart the topic?
Étes-vous au courant d'autres écoles/médiateurs/agents d’extension qui participent à des programmes de bien-être animal ou qui enseignent ou impartissent ce sujet?
Connaissez-vous d'autres écoles/professeurs/aides de vulgarisation qui participent à des programmes de bien-être animal ou qui enseignent ou implantent le sujet?

4. Are you aware of any animal welfare teaching or implanting resources?

Connaissez-vous des formations ou implantation de ressources sur le bien-être animal?

○ Si vous êtes au courant, y est-il des raisons particulières pour lesquelles vous ne les utilisez pas?

5. Do you teach about animal welfare in the classroom?

Fermez-vous enseigner le bien-être des animaux dans la salle de classe ou activités?

6. If you do teach about animal welfare what topics do you cover? What resources do you use?

Si vous enseignez/fermez sur le bien-être animal quelles sujets couvrez-vous? Quelles ressources utilisez-vous?

7. If you do not teach about animal welfare what would you need before you might consider the topic for your classroom or working animal owners?

Si vous n'enseignez/fermez pas sur le bien-être des animaux, de quoi auriez-vous besoin avant d'envisager le sujet pour votre classe ou les propriétaires d'animaux de travail?

8. If you don’t, why not?

Si non pour quoi pas?

9. What methods do you use to bring new knowledge to working animal owners about animal welfare?

Quelles méthodes utilisez-vous pour apporter de nouvelles connaissances aux propriétaires d'animaux sur le bien-être des animaux?

• Improve the animal husbandry extension system
10. What methods do you use to bring new knowledge to farmers in the animal husbandry extension system?
Quelles méthodes utilisez-vous pour apporter de nouvelles connaissances aux producteurs dans le système d'extension de l'élevage ?

11. Which methods work the best with farmers in the animal husbandry extension system?
Quelles sont les méthodes qui fonctionnent le mieux avec les producteurs dans le système de vulgarisation de l'élevage ?

12. Which methods have not worked well with farmers in the animal husbandry extension system?
Quelles sont les méthodes qui n'ont pas fonctionné avec les producteurs dans le système de vulgarisation de l'élevage ?

13. Why these methods did not work well with farmers in the animal husbandry extension system?
Pourquoi ces méthodes ne fonctionnaient-elles pas bien avec les producteurs dans le système de vulgarisation de l'élevage ?

14. What opportunities do these issues and trends present for the University of Agricultural Sciences?
Quelles opportunités ces questions et tendances présentent-elles à l'Université des Sciences Agronomiques ?

15. What opportunities do these issues and trends present for the extension system?
Quelles opportunités ces questions et tendances présentent-elles pour le système de vulgarisation de l'élevage ?

16. What opportunities are there for collaboration within the University, across the university, and with extension systems?
Quelles sont les possibilités de collaboration au sein de l'Université, ainsi qu'au niveau du pays et/ou avec le système de vulgarisation?

17. In what areas do you feel less supported/more supported in your work?

Dans quels domaines vous sentez-vous moins soutenus/moins soutenus dans votre travail?

18. What are the areas in which you have received support/training and resources?

Quels sont les domaines dans lesquels vous avez reçu de l'aide / de la formation et des ressources?

19. How do continuing professional education opportunities contribute to your experience in your position in the national extension education system?

Comment les possibilités de renforcement de capacités professionnelles contribuent-elles à votre expérience dans votre poste dans le système d'extension de l'éducation?

20. What continuing professional education topics are needed to support agents in the national extension education system?

Quels sont les sujets de renforcement de capacités professionnelles nécessaires pour soutenir les agents du système de vulgarisation?

o What technical information do you need to teach or share information with producers?

Quelles informations techniques avez-vous besoin pour enseigner ou partager des informations avec les producteurs?

o Exchanging other practices in teaching producers?

Avez-vous d'autres expériences pratiques dans l'enseignement/formation des producteurs?

Wrap-Up
At the end of the focus group session, we will closely thank all participants for their time and input. If they will have any questions or final comments, we will ask them to be free to raise them.
Appendix J: First IRB Approval

MEMORANDUM

DATE: December 18, 2015
TO: Donna Westall-Rudd, Ousnane Kane
FROM: Virginia Tech Institutional Review Board (FWA0000072, expires July 29, 2020)

PROTOCOL TITLE: Ways to expand the welfare component in the extension system in Thies and Bambey, Senegal

IRB NUMBER: 15-530

Effective December 18, 2015, the Virginia Tech Institutional Review Board (IRB) Chair, David M Moore, approved the New Application request for the above-mentioned research protocol.

This approval provides permission to begin the human subject activities outlined in the IRB-approved protocol and supporting documents.

Plans to deviate from the approved protocol and/or supporting documents must be submitted to the IRB as an amendment request and approved by the IRB prior to the implementation of any changes, regardless of how minor, except where necessary to eliminate apparent immediate hazards to the subjects. Report within 5 business days to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

All investigators (listed above) are required to comply with the researcher requirements outlined at:

http://www.irb.vt.edu/pages/responsibilities.htm

(Please review responsibilities before the commencement of your research.)

PROTOCOL INFORMATION:

Approved As: Expedited, under 45 CFR 46.110 category(ies) 6, 7
Protocol Approval Date: December 18, 2015
Protocol Expiration Date: December 17, 2016
Continuing Review Due Date: December 3, 2016

"Date a Continuing Review application is due to the IRB office if human subject activities covered under this protocol, including data analyses, are to continue beyond the Protocol Expiration Date.

FEDERALLY FUNDED RESEARCH REQUIREMENTS:

Per federal regulations, 45 CFR 46, 102, the IRB is required to compare all federally funded grant proposals/work statements to the IRB protocols, which cover the human research activities included in the proposal/work statement before funds are released. Note that this requirement does not apply to Exempt and minimal IRB protocols, or grants for which VT is not the primary awardee.

The table on the following page indicates whether grant proposals are related to this IRB protocol, and which of the listed proposals, if any, have been compared to this IRB protocol, if required.
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*Note: This proposal number was compared, assessed as not requiring comparison, or comparison information was revised.

If this IRB protocol is to overlap any other grant proposals, please contact the IRB office (irbadmin@vt.edu) immediately.
Appendix K: Extended IRB Approval

TO:       Uoma Westai-Kuo, Usmane Kane
FROM:     Virginia Tech Institutional Review Board (FWA0000572, expires January 29, 2021)
PROTOCOL TITLE: Ways to expand the welfare animal component in the extension system in Thies and Bambye, Senegal
IRB NUMBER: 15-530

Effective November 21, 2016, the Virginia Tech Institution Review Board (IRB) Chair, David M Moore, approved the Continuing Review request for the above-mentioned research protocol.

This approval provides permission to begin the human subject activities outlined in the IRB-approved protocol and supporting documents.

Plans to deviate from the approved protocol and/or supporting documents must be submitted to the IRB as an amendment request and approved by the IRB prior to the implementation of any changes, regardless of how minor, except where necessary to eliminate apparent immediate hazards to the subjects. Report within 5 business days to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

All investigators (listed above) are required to comply with the researcher requirements outlined at: http://www.irb.vt.edu/pages/responsibilities.htm

(Please review responsibilities before the commencement of your research.)

PROTOCOL INFORMATION:
Approved As: Expedited, under 45 CFR 46.110 category(ies) 6,7
Protocol Approval Date: December 18, 2016
Protocol Expiration Date: December 17, 2017
Continuing Review Due Date: December 3, 2017

FEDERALLY FUNDED RESEARCH REQUIREMENTS:
Per federal regulations, 45 CFR 46.103(f), the IRB is required to compare all federally funded grant proposals/work statements to the IRB protocol(s) which cover the human research activities included in the proposal/ work statement before funds are released. Note that this requirement does not apply to Exempt and Intern IRB protocols, or grants for which VT is not the primary awardee.

The table on the following page indicates whether grant proposals are related to this IRB protocol, and which of the listed proposals, if any, have been compared to this IRB protocol, if required.
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*Note: This proposal number was compared, assessed as not requiring comparison, or comparison information was received.

If this IRB protocol is to cover any other grant proposals, please contact the IRB office (irbadmin@vt.edu) immediately.
Appendix L: Interview Protocol

In-depth Interview protocol

The purpose of this interview is to understand how agricultural education teachers who are involved in the animal husbandry extension system and extension agents perceive their participation, roles, and experiences in the extension process in order to develop a set of recommendations to improve the extension education programs for training farmers, state extension agents, staff, and teachers who are involved in the animal husbandry extension system in Douroub and Thar regions. To do so, the following questions will be asked to the participants:

1. Please share with me the perception of your participation, roles, and experiences in the current teaching, presenting, and offering methods used in the extension system by responding to these several questions:
   a. How long have you been involved in the extension system?
   b. What influenced your decision to become involved in the extension system?
   c. What was your first experience as part of the extension system?
   d. What are animal husbandry extension programs currently taught, presented, or offered in other animal species in the Douroub and Thar regions of Lebanon?
   e. How are animal husbandry extension programs currently taught, presented, or offered for working animals?
   f. Have you developed the current teaching curriculum that you used for students or farmers?
   g. How much flexibility do you have to include any topic that will allow your students/teachers to meet the standards by which achievements and progress are measured for any domain or key learning areas?
What criteria do you apply when choosing course to meet the curriculum?

Quels critères appliquez-vous lorsqu'en choisissant le contenu pour répondre au programme?

Do you teach or implicit about animal welfare in the classroom for your stakeholders in the extension system?

Enseignez-vous ou impliquez-vous sur le bien-être animal dans la salle de classe pour vos intervenants dans le système de vulgarisation?

From your experiences what recommendations will you make to improve the current teaching, presenting and offering methods used in the extension system?

D’après vos expériences, quelles recommandations ferez-vous pour améliorer les méthodes actuelles d’enseignement, de présentation et d’offre utilisées dans le système de vulgarisation?

Now thinking about your personal animal husbandry education program and the recommended student-centered teaching practices be used in extension programs during the implementation of these programs, please share with me about these topics by responding the following questions:

What courses are you currently teaching?

Quels sont les cours que vous enseignez actuellement?

How have your courses changed over time?

Comment vos cours ont-ils changé au fil du temps?

How do extension agents and teachers in an animal management extension education program respond to problem-based learning?

Comment les agents de vulgarisation et les enseignants d'un programme de vulgarisation en gestion des animaux répondent-ils à l'apprentissage basé sur des problèmes?

How extension agents and teachers in an animal management extension education program design problem-based learning?

Comment les agents de vulgarisation et les enseignants d'un programme d'éducation de vulgarisation en gestion des animaux conçoivent-ils l'apprentissage basé sur des problèmes?

What strategies and methods have been used to support livestock extension agents and teachers in coping with student-centered teaching practices?

Page 2 of 5
Quelles stratégies et méthodes ont été utilisées pour former les agents de vulgarisation et les enseignants dans l'adaptation aux pratiques pédagogiques orientées sur l'alphabétisation ?

f. How do continuing professional education opportunities contribute to your expertise in your position in the animal husbandry extension system?

Comment les possibilités de renforcement de capacité contribuent-elles à votre expertise dans votre position dans le système d'alphabétisation ?

g. What factors influence the effectiveness of different continuing professional education approaches for livestock extension agents and teachers?

Quels sont les facteurs qui influencent l'efficacité des différentes approches de renforcement de capacité pour les agents de vulgarisation et les enseignants ?

h. What continuing professional education topics are needed to support agents in the animal husbandry extension system?

Quels sujets de renforcement de capacité sont nécessaires pour soutenir les agents du système de vulgarisation de l'alphabétisation ?

i. How do you think the continuing professional education topics should be implemented to support agents in the animal husbandry extension system?

Comment penseriez-vous que les thèmes de renforcement de capacité devraient être implantés pour soutenir les agents du système de vulgarisation de l'alphabétisation ?

j. How can the continuing professional education of livestock extension agents and teachers be institutionalized?

Comment le renforcement de capacité des agents de vulgarisation et des enseignants peut-il être institutionalisé ?

k. From your experiences, what recommendations will you make to improve the animal husbandry extension program and student-centered teaching practices you found during the implementation process?

D'après vos expériences, quelles recommandations ferez-vous pour améliorer le programme d'éducation sur l'alphabétisation et les pratiques d'enseignement centrées sur l'élève que vous avez trouvées pendant le processus de mise en œuvre ?

III. In the implementation processes for farmers, your experiences varied over time, please share with me an experience you found in practical teaching practices in your professional training by responding these questions:

a. How do farmers respond to an animal management program focused on animal husbandry practices for working animal?
Comment les agriculteurs répondent-ils à un programme de gestion des animaux mis sur les pratiques d'élevage des animaux de travail?

b. How do Extension agents and workers perceive farmers' responses on animal husbandry practices for working animals?

Comment les agents de réparation et les enseignants perçoivent-ils les réponses des agriculteurs aux pratiques d'élevage des animaux de travail ?

c. What strategies are used to facilitate positive farmers' responses on animal husbandry practices for working animals?

Quelles sont les stratégies utilisées pour faciliter les réactions positives des agriculteurs sur les pratiques d'élevage des animaux de travail ?

d. What recommendations will you make to improve farmers' responses on animal husbandry practices for working animals?

Quelles recommandations ferez-vous pour améliorer les réponses des agriculteurs aux pratiques d'élevage des animaux de travail ?

IV. Assuring farmers to ensure standards welfare for animal husbandry require the partnership with the extension educators, faculty members and others involved in the extension educational system in animal husbandry practices for working animal by responding the question below.

a. How do extension educators assist farmers in adhering to accepted standards welfare for animal husbandry are maintained including the care, feeding and physical wellbeing of domestic animals?

Comment les agents de répétition assurent les agriculteurs à maintenir le respect des normes acceptées de bien-être pour l'élevage des animaux domestiques, y compris les soins, l'alimentation et le bien-être physique des animaux domestiques ?

b. What opportunities are there for collaboration within the University, across the state, and/or with extension system in order to ensure accepted standards welfare for animal husbandry?

Quelles sont les possibilités de collaboration à l'intérieur de l'Université, dans l'ensemble du pays et/ou avec le système d'extension pour assurer un bien-être standard accepté pour l'élevage ?

c. In what forms do you think would improved support (training and resources) for collaboration within the University, across the state, and/or with extension system?

Dans quels domaines vous souhaiteriez que la formation et les ressources soient améliorées pour la collaboration à l'intérieur de l'Université, à travers l'État et/ou avec le système d'extension ?

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d. In what ways do you feel less supported/more supported in order to ensure accepted standard welfare for animal husbandry?

Deux quels dommages vous faîtes-vous moins dehors / dommages davantage pour amener un bien-être standard accepté pour l'agriculture?

e. What are the key problems to improve in order to ensure accepted standard welfare?

Quels sont les principaux problèmes à modifier afin d'assurer un bien-être standard accepté?

f. What are the major challenges facing by farmers developed to ensure a standard welfare for working animals?

Quels sont les principaux défis auxquels sont confrontés les producteurs pour assurer un bien-être standard pour les animaux de travail?

g. What kind of teaching-learning methods might be used for to ensure a standard welfare for working animals?

Quelles méthodes d'apprentissage pourraient être utilisées pour assurer un bien-être standard pour les animaux de travail?

h. From your experiences what recommendation will you make to ensure a standard welfare for working animals?

D'après vos expériences, quels recommandations ferez-vous pour assurer un bien-être standard pour les animaux de travail?

Wrap-Up

We are now at the end of the focus group questions. We want to sincerely thank you for your time and input. If you have any questions or final comments, please feel free to voice them.