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ASSESSMENT OF THE IMPACT OF TRANSHUMANCE ON THE SUSTAINABLE MANAGEMENT OF ANIMAL GENETIC RESOURCES

Under the Funding Strategy for the Implementation

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ADVERSE EFFECTS OF TRANHUMANCE ON INDEGENOUS RUMINANT LIVESTOCK IN THE GAMBIA

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Food and Agriculture Organization
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Regional Project on Sustainable
Management of Endemic Ruminant
Livestock in West Africa (PROGEBE)

ABBREVIATIONS AND ACRONYMS

ANR	Agriculture and Natural Resources
BQ	Black Quarter Disease
CBPP	Contagious Bovine Pleuropneumonia
CRR	Central River Region
DLS	Department of Livestock Services
DOA	Department of Agriculture
DOP	Department of planning
ECOWAS	Economic Community of West African States
ERL	Endemic Ruminant Livestock
FAO	Food and Agriculture Organization
FMD	Foot and Mouth Disease
GDP	Gross Domestic Product
GNAIP	Gambia National Agricultural Investment Plan
HS	Haemorrhagic Septicaemia
ILRI	International Livestock Research Institute
ITC	International Trypanotolerance Centre
LRR	Lower River Region
LSD	LUMPY SKIN DISEASE
MOA	Ministry of Agriculture
NAPD	National Action Plan on Desertification
NARI	National Agricultural Research Institute
NBR	North Bank Region
PAGE	Programme for Accelerated Growth and Employment
PPR	Peste des Petits Ruminants
PROGEBE	Project Regionale de Gestion durable du Betail Ruminant Endemic
WAD	West African Dwarf Goat
WCR	West Coast Region

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Executive Summary

Livestock plays a significant role in The Gambia's national economy, contributing about 29.6% of Agricultural GDP and about 8.6% of National GDP. It also plays a key role in meeting domestic demand in meat, milk, power and manure for cropping. Livestock and its value chain provide sustainable livelihood opportunities to Urban and Peri Urban populations in the country.

The Gambia has a very high livestock density. Endemic ruminant livestock namely N'dama cattle, D'jallonke sheep, and the West African Dwarf goats comprise the predominant breed of ruminants in the country. The breeds are trypanotolerant and also well adopted to and productive in their natural habitats. However they are threatened by a number of factors which include destruction and degradation of their natural habitats and threat of genetic dilution through cross breeding with less resistant Sahelian breeds.

The goal of the Project for the sustainable management of endemic ruminant livestock of west Africa (PROGEBE) is to remove existing barriers to the in-situ conservation of three priority endemic ruminant livestock species – N'Dama cattle, Djallonke sheep, and the West African Dwarf goat while ensuring sustainable use of these livestock breeds to enhance livelihoods of the rural communities in the four priority countries of Guinea, Mali, Senegal and The Gambia. In addition, the project aims at developing and implementing models for community-based conservation and management of critical habitat for these species, thereby demonstrating strategies for preserving the unique genetic trait/habitat complexes that are of global significance.

In West Africa where ruminant livestock production is predominantly extensive, livestock depend mainly on natural pastures, and transhumance is widely practiced to take advantage of the seasonality of fodder growth – abundant during the rains and scarce during the dry season. The movement of livestock from the drier areas to the wetter ones especially during the dry season often results in unintended crossbreeding between the larger frame ruminant livestock from the arid and semi-arid areas to the wetter dry sub-humid and humid areas. Some studies have therefore been carried out to review and document the existing knowledge on transhumance in these countries and the effects (actual or potential) on ERL. It is in line with the above, that the consultant was recruited to conduct this study under the framework of the project on "Assessment of the impact of transhumance on the sustainable management of animal genetic resources" which is part of the portfolio of projects submitted under the First Call for Proposals related to the FAO Trust Account in support of the Global Plan of Action (GPA) for Animal Genetic Resources for the biennium 2013-2014 and approved for funding by the Commission on Genetic Resources for Food and Agriculture (GCP/GLO/287/MUL). In March 2014, the International Trypanotolerance Centre (ITC) signed a Letter of Agreement with the Food and Agriculture Organization of the United Nations (FAO) for the provision of activities and services in support of the project. The overall objective of the project is to provide a better understanding of the impact of transhumance to the sustainable management of endemic ruminant livestock in Sahelian areas of The Gambia, Guinea, Mali and Senegal

It was in this vein that the following Terms of References were set for the consultant:

- Define the diversity of livestock territories in The Gambia with emphasis on Endemic Ruminant Livestock in Kiang West, Niamina East and Nianija Districts
- Define the transhumant production systems in terms of livestock populations, periods, evolution and the flow map in The Gambia

- Determine the effects of transhumance on endemic animal Genetic Resources
- Propose mitigation measures for the identified effects and make recommendations for promoting the implementation of the mitigation measures.

The transhumance surveys were carried out in the 3 PROGEBE Gambia primary sites namely the districts of Kiang West, Niamina East and Nianija. The design adopted for the survey was based on a cocktail approach combining quantitative and qualitative approaches commonly known as pluralistic design. The consultancy employed 3 main research methods comprising: Desk study (literature review), Key Informant Interviews involving consultations with relevant stakeholders/actors using questionnaires and Comprehensive Herd Survey using questionnaires.

Key Results on Endemic Ruminant Production and productivity

Based on the 2013 Livestock Census conducted by PROGEBE-Gambia, the cattle population in the 3 sites are as follow: Nine Thousand Two Hundred and Sixty Nine heads of cattle (9269) in Kiang West which shows a decrease of 2.8% from the Ten Thousand Seven Hundred and Sixteen (10716) heads of cattle in 2010, Nine Thousand and Fifty Eight (9058) heads of cattle in Niamina East which represents an increase of 39.0% from the Six Thousand Five Hundred and Thirty (6530) heads of cattle in 2010 and Six Thousand Eight Hundred and Eleven (6811) heads of cattle in Nianija which represents an increase of 14.8% from the Five Thousand Nine Hundred and Thirty Two (5932) heads of cattle in 2010. There has been an increase in cattle population in project sites attributable to increase births and less mortality.

The annual off-take rate in all the 3 districts remains low with Kiang West having registered the lowest off-take rate of 4.5%, followed by Niamina East with 6.9% and Nianija with 8.9%. The off-take rate in all the 3 districts is below the national average of 12%. The low off-take rate registered in the survey is one of the contributing factors to undue pressure on range resources which limits the carrying capacities of rangelands thus contributing to overgrazing and environmental degradation.

The annual mortality rate in cattle is as follow: 10 % in Nianija, 7% in Niamina East and 6.9% in Kiang West. The average mortality for the 3 districts combine is 7.96%. This compares very favorably with the mortality rates registered during the PROGEBE-Gambia Baseline Report (ILRI 2010), disease remains a substantial contributor to low livestock productivity and high mortality in livestock populations in project sites. Contagious Bovine Pleuropneumonia (CBPP) has been reported as the principal cause of mortality in Nianija and Niamina West. There has been a resurgence of the disease in The Gambia since 2012, after 41 years of absence in the country. Measure being taking to control the diseases has succeeded to halt its spread

Milk yield in all the 3 districts is low. The average daily milk yield during the peak period (rainy season) is 1.5 litres per milking cow in Nianija, 1.3 litres per milking cow in Kiang West and 1 litre per milking cow in Niamina East. During the low period (dry season), the average daily milk yield per milking cow is as follow: 0.5 litres in Nianija, 0.4 litres per milking cow for both Kiang West and Niamina East. This results indicate that local milk supply is highly seasonal with the highest production during the rainy season when fodder is abundant.

In terms of breed composition of the herds, 100% of herds in Kiang West comprise of N'dama Cattle only whilst in Niamina East the herd composition is as follow: 99.4% of herds comprise of N'dama cattle only, and the remaining 1.6% of the herds comprise of N'dama and mixed breed. In Nianija, 92.1% of herds comprise of N'dama cattle only, 5.3% of herds comprise of N'dama and Zebu and the remaining 2.6% of herds comprise of N'dama and mix breed**.**

On cattle housing, the overwhelming majority of cattle are housed in open kraals or pens both during the dry and rainy seasons. For both Kiang West and Nianija districts this was 100%. However in Niamina East, a limited number of herds (6.6%) use kraals or pens with roofs. In general, the findings on housing for cattle has shown that there has not been any progress when compared to the baseline survey findings in 2009. In that survey, a limited number of households (8%) use kraals or pens with roofs.

On small ruminant housing, 75.9% of women respondents housed their small ruminants in closed pens either with or without raised platform and only 24.8% of respondents housed their small ruminants in open pens or kraals. This indicates some improvements when compared to the results of the PROGEBE-Gambia baseline survey 2009 which found that 67% of households use kraals or pens with roof or stable with roofs to accommodate their goats while 41.6% and 36.3 % of households use kraals or pens with roof or stable with roofs to accommodate their sheep in wet and dry season respectively.

Cattle feeding is based predominantly on pastures only although other feed resources are being used. the findings indicate that in Kiang West where there is vast expanse of grazing resources with less pressure on the land, 96.4% of herds are grazed on natural pastures only whilst 3.6% graze on natural pastures and other feed resources. In Niamina East where there is relatively more pressure on grazing resources due to bush fires and rice expansion, 71.7% graze on natural pastures only and the remaining 28.3% gazed on natural pastures and other feed resources. In Nianija, 84.2% of herds graze on natural pastures only and the remaining 15.8% graze on natural pastures and other feed resources. There has been an expansion of settlements in the district and use of grazing lands for crop farms and rice expansion.

With regards to small ruminant feeding, 62.1% of women respondents in the survey, feed their small ruminants on natural pastures only whereas 37.9% feed their small ruminants on a combination of natural pastures and other feed resources.

On mating practices in cattle, the findings indicate that 0% of herds in Kiang West practice strictly control mating, 35.7% in Niamina East and 57.9% in Nianija. Loosely control mating is practiced by 51.7% of herds in Kiang West, 56.3% of herds in Niamina East and 26.3% of herds in Nianija. Uncontrolled mating is practiced by 48.3% in Kiang West, 10.7% in Niamina East and 15.8% in Nianija. In reference to the 2009 baseline survey, there has been tremendous progress made by cattle herders across all the 3 sites in terms of breeding practices.

Small ruminant mating is mainly uncontrolled as evidenced by the findings indicating that uncontrolled mating is practiced by: 78.9% of our respondents in Kiang West, 69.6% in Niamina East and 77.3% in Nianija. If compared to 2009 baseline survey report, some progress has been registered in the breeding

practiced in project sites. This could be attributable to the high adoption rate of technologies and skills by women farmers.

Access to water, inadequate feed and diseases (disease control and access to veterinary services, drugs and vaccines) are the 3 top constraint for ERL production at project sites. Other constraints include Inadequate grazing land, Mosquitoes, Bush fires, Stock routes and Tsetse challenge.

Taking reference from the baseline survey data 2009 and the findings of this survey, it has been observed that PROGEBE has made some impact on ERL production at project sites. This has been achieved through provision of tools and skills on animal husbandry including improved feeding, health care and housing and management strategies as well provision of other support infrastructure.

Key Results on Transhumance

In the Gambia, transhumance is a well-known practice that has for years been an integral part of the traditional livestock production system as a resilience strategy to deal with shortages of feed, water, and grazing land as well avoidance of pest and diseases. Cattle was the species mostly involved in all the 3 sites, although small ruminants were also involved .The results of the survey strongly indicate that transhumance is highly organised in the Gambia but unregulated.

The survey findings reveal that the type of transhumance practiced involves herders within the districts, herders from other districts and regions within the country as well as herders from Senegal. The districts of Nianija and Niamina East play multiple roles in transhumance, serving as source, host and transit. In Kiang West, the predominant practice in some parts of the district is low level internal transhumance whilst no transhumance is practiced in most part of the district.

Based on the departure period and the length of stay at final destinations, the study identified two main types of transhumance practiced namely rainy season and dry season transhumance. For rainy season transhumance, resident herds depart just before the onset of the rainy season. This period is the most common departure period in Nianija and Niamina East cited by 84.2% and 46.4% respectively. Rainy season transhumance in these two districts is usually associated with restricted environment for cattle due to competition of space between herders and crop farmers. The departure is appropriately scheduled to avoid damages to crops as cattle tracks are generally inadequate to prevent crop damages. In the case of Niamina East avoidance of mosquitoes is also factored in. For dry season transhumance, the departure time is at the end of rainy season or early dry season. Dry season Transhumance is practiced in all the three districts as cited by percentage of herders as follow: 23.3% in Kiang West, 12.5% in both Niamina East and Nianija. It is accordingly scheduled so that the animals can move into rice fields and flood plains when the rice crop is harvested. Rice straw, abundant pastures and fresh water are available in the fields.

In the past 5 years, disease outbreaks and mortalities during transhumance have been encountered in all the 3 districts. Foot and Mouth Disease (FMD), Lumpy Skin Disease (LSD), Black Quarter Disease (BQ), Haemorrhagic Septicaemia (HS), Contagious Bovine Pleuropneumonia (CBPP) and Anthrax were the major

diseases of concern in cattle. With regards to small ruminants, the diseases of concern were Peste des Petit Ruminants (PPR) and Pasteurellosis.

There are stock routes available in all the 3 districts but evidently inadequate. Wherever stock routes are available, they are the routes of choice for transhumant herders especially for those herds that migrate during the onset of the rainy season when cultivation is in progress. It was highlighted that some stock routes need re-demarcation as they have disappeared as a result of the expansion in crop farming leading to encroachment into the areas where the cattle tracks previously existed.

The choice of final destination depends on a number of factors, key among which are the availability of sufficient grazing resources (pastures), adequate water for the cattle, large unrestricted grazing space for the animals to avoid conflict with crop farmers and freedom from biting insects (mosquitoes and tsetse flies) as well as other disease related factors. Due to these and other reasons such as social interaction with host communities, transhumant herders tend to be very selective of their host destinations. Over the years, they are have built special relationships with some host communities and they tend to repeatedly go to the same destinations.

The Local Conventions on the Sustainable Management of the Natural Resources have come into effect in all the 3 districts since August 2012. They are sets of agreements undertaken by the community with the support of relevant stakeholders to take charge of their shared natural resources. The use of these conventions is envisaged to support the communities in their drive to enforce regulations on the control of bush fires, illegal cutting of trees, manage use of water and prevent overgrazing. It is strongly believed that good environmental friendly practices must be used in a holistic way and linked to the capacity of the land. The Conventions provide a framework for regulation of transhumance at village. It is thus very crucial to step up sensitization of stakeholders involve in transhumance. The findings of the survey have revealed that there is low level of awareness on the code of conduct by the herders in all the 3 districts. The level of compliance by herders to the code of conduct is also generally low.

There is high level of awareness on the beneficial effects of transhumance on crops. With the high cost of fertilizer, farmers in host communities totally rely on farm yard manure to fertilize their crop fields. There is higher crop yield and higher income for crop farmers in all recipient communities.

The interactions between transhumant herds and resident herds varied from region to region and also within region. They share the same grazing lands. The type of interaction among others depend on the management system practiced by the herder involved and the stocking density at the grazing fields The type of interaction between the herds is a major predisposing factor to the possibility of cross breeding occurring. The high level of free interactions is a source of concern. This should be addressed by herders through better management practices like herding the animals and not to leave them free.

N'dama cattle is the predominant breed of arriving herds and at final destination for all the 3 districts. In Niamina East, the findings of the Herd Owners Survey revealed that 87% of respondent Herd Owners put the breed composition of arriving herds as N'dama and the remaining 13% of respondents put the breed composition as Mixed. In Nianija, 80% of respondent Herd Owners selected N'dama and 20% selected

mixed breed as the predominant breed of arriving herds. There were no destinations with predominantly Zebu cattle 0%. There were destinations with predominantly mixed breeds as cited by 13.8 % in Niamina east and 7.9 in Nianija.

There were no known cases of cross breeding reported in Kiang West. In Niamina East, known cases of cross breeding were reported by 10.3% of transhumant herders and in Nianija 12.5% of transhumant herders. In Nianija according to 33.3% of the herders who have known cases of cross breeding, it occurs regularly every year whilst for the remaining 67.7 % it occurs as isolated incidences. In Niamina East 57.2% of transhumant herders stated that it occurs regularly and 42.9% says it occurs as isolated incidences. The findings of the study revealed that there were no known cases of controlled cross breeding in all the 3 sites.

With regards to small ruminants ERL constitute the predominant breed of arriving flocks. In Niamina East, the findings of the Women Small Ruminant Owners Survey revealed that 81.9% of respondents put the breed composition of arriving small ruminant flocks as ERL and the remaining 18.1% of respondents put the breed composition as Mixed. In Nianija, 53.9% of respondents' selected ERL breeds and 46.1% selected mixed breeds as the predominant breed of arriving small ruminants. .

A high percentage of herders in all the 3 districts are not aware of the adverse effects on transhumance on the environment. The findings are as follow: 60.5% in Nianija, 39.2% in Niamina East and 30% in Kiang West. For those aware, they cited overgrazing, cutting down of tree branches, bush fires, destruction of crops, and competition for water, erosion and environmental pollution as the main adverse effects of transhumance on the environment. The magnitude of each effect varies from district to district to district.

Overgrazing of pastures was reported in all 3 districts. 26.3% in Nianija, 23.2% in Niamina East and 3.3% in Kiang West. The relative higher percentage in Nianija could be attributed to a combination of factors including an expansion of settlements in the district which also led to conversion of grazing lands for crop production and decrease fallow-periods in arable lands. Furthermore, regular bush fires, overstocking/ imbalanced distribution of animals over the rangelands, diminish soil fertility, carrying capacities, and high stocking rates are all contributing factors to over grazing. Capacity building on feed conservation, intensive feed gardens and propagation of fodder seeds were provided to beneficiaries by PROGEBE.

Identification and assessment of a number of predisposing risk factors highlighted in the findings of the survey including breed composition of arriving herds and herds at final destination, level of interactions, length of stay, breeding practice and frequency of cross breeding, indicate that with regards to cattle, there is risk of genetic dilution through crossbreeding with transhumant mixed breeds though the risk could be considered low risk as N'dama cattle is the predominant breed of herds at the final destination for all the 3 districts.

In small ruminants, taking into account the predominantly uncontrolled mating and free range system management system practiced coupled with relatively high proportion of mixed and Sahelian breeds in the composition of arriving flocks, the risk of genetic dilution through uncontrolled cross breeding between the local breeds and arriving mixed and Sahelian breeds in small ruminants is high. The level of the risk depends on the district involved, with Nianija having the highest level.

The study reveal that unregulated transhumance poses a real threat to endemic ruminant populations in The Gambia. There is high risk of introductions of Transboundary Animal Diseases (TADs). The reintroduction of CBPP into the country in 2012, after 41 years of absence of the disease is a testimony to this.

The beneficial effects of transhumance as it is practiced in the Gambia out weights its adverse effects. It is the foundation pillar upon which low input sustainable crop and livestock production is built. However there are major challenges confronting transhumance which needs to be addressed. These challenges include the unregulated nature of the practice, equitable and sustainable utilization of natural resources for both sustainable livestock and crop production and prevention and control of Transboundary Animal Diseases (TADs) such as Foot and Mouth Disease (FMD), Lumpy Skin Disease (LSD) and Contagious Bovine Pleuropneumonia (CBPP) and environmental degradation through over grazing, bush fires and deforestation.

Furthermore, the livestock sector policy of the Gambia has not fully responded to some of the above and other emerging challenges such as animal genetic resources management including the protection/ conservation of indigenous/endemic breeds, equitable and sustainable management of the country's range and livestock feed resources base including encroachment on traditional lowland grazing areas for rice cultivation and the regulation of cross border transhumance. There is therefore an urgent need for policy response to adequately address the issues highlighted above. Regulation of transhumance and the efficient, compliance with code of conduct on efficient and sustainable utilisation of natural resources and management of dual purpose lands for grazing, crop production and rice cultivation provides a viable alternative. Rotation of crop/ rice fields and pastures is worthy of consideration.

In conclusion, policy recommendations targeting Government and recommended practical actions targeting communities and transhumant herders were made. The Key policy recommendations include: Development of a national transhumance policy within the framework of existing and emerging national and regional initiatives; closer collaboration with Senegal within the framework of a bilateral cooperation agreement between the Ministries in charge of livestock in the two countries; formulation of an appropriate national pasture policy within the overall framework of an updated more responsive National Livestock Policy; provision of infrastructure to support transhumance which will include stock routes/ transhumance corridors, and watering facilities such as bore holes; updated disease control policy reflecting current and future needs in particular prevention and control of emerging and re-emerging Transboundary Animal Diseases; and finally the development of a comprehensive national policy on Animal Genetic Resources which will include the protection of endemic ruminant livestock breeds.

1. INTRODUCTION AND BACKGROUND

1.1. Project Description

The **Sustainable Management of Globally Significant Endemic Ruminant Livestock in West Africa (PROGEBE)** project aims to remove existing barriers to the *in situ* conservation of the three priority endemic ruminant livestock species—N'Dama cattle, Djallonké sheep and the West African Dwarf goat while ensuring sustainable use of these livestock breeds to enhance livelihoods of the rural communities in the four priority countries of Guinea, Mali, Senegal and The Gambia. In addition, the project aims at developing and implementing models for community-based conservation and management of critical habitat for these species, thereby demonstrating strategies for preserving the unique genetic trait/habitat complexes that are of global significance. The project design is experimental, developing and testing an integrated approach to livestock conservation and management. This approach simultaneously addresses livestock breeding and productivity; market development, incentives and economic policies; traditional and evolving patterns of resource use and land tenure; policies and legal frameworks; and information sharing and communication at the national and international levels. The project is supported by two major financiers, the Global Environment Fund (GEF) —and the African Development Bank (AfDB) and is executed by the United Nations Office for Project Services (UNOPS) with UNDP for facilitation and operational procedures.

The project specifically centres its activities around the following outcomes: (i) conservation and increase in productivity of ERL; (ii) promotion of market development and incentives; (iii) promotion of greater sustainable management of their ecosystem (iv) facilitation of the implementation of policies, legal and institutional frameworks favourable to their development, (v) improving cooperation, knowledge management and information sharing at the national and international levels.

1.2. ***Background of consultancy***

In West Africa where ruminant livestock production is predominantly extensive, livestock depend mainly on natural pastures, and transhumance is widely practiced to take advantage of the seasonality of fodder growth – abundant during the rains and scarce during the dry season. The movement of livestock from the drier areas to the wetter ones especially during the dry season often results in unintended and even intended crossbreeding between the larger frame ruminant livestock from the arid and semi-arid areas to the wetter dry sub-humid and humid areas.

Endemic Ruminant Livestock (ERL) are the dominant breeds in sub-humid zone of West Africa because of their tolerance to tsetse-borne trypanosomosis, which is a serious barrier to the sustainable production of the larger frame trypano-susceptible breeds endemic to the dryer ecosystems. The continued, unplanned and unregulated crossing of the ERL in the wetter zones with their larger frame cousins from the dry Sahel is gradually leading to gene dilution of the former, and may in the long run result in a serious threat to their continued survival and the loss of this unique adaptation to a hostile environment.

Evidence exists (Ayantunde et al. 2010)[1] that the presence of transhumant herds in the sub-humid zone has a potential to negatively impact on the management and conservation of the ERL, the direct effect being the risk of genetic dilution through crossbreeding with transhumant Zebu breeds from the Sahel.

Ruminant livestock population in the four priority countries is estimated at 24 million heads of cattle

which 15% are trypanotolerant ERL living exclusively in sub-humid areas. Some studies have therefore been carried out to review and document the existing knowledge on transhumance in these countries and the effects (actual or potential) on ERL.

The project on "Assessment of the impact of transhumance on the sustainable management of animal genetic resources" under which is study was conducted, is part of the portfolio of projects submitted under the First Call for Proposals related to the FAO Trust Account in support of the Global Plan of Action (GPA) for Animal Genetic Resources for the biennium 2013-2014 and approved for funding by the Commission on Genetic Resources for Food and Agriculture (GCP/GLO/287/MUL). In March 2014, the International Trypanotolerance Centre (ITC) signed a Letter of Agreement with the Food and Agriculture Organization of the United Nations (FAO) for the provision of activities and services in support of the project. The overall objective of the project is to provide a better understanding of the impact of transhumance to the sustainable management of endemic ruminant livestock in Sahelian areas of The Gambia, Guinea, Mali and Senegal. This study will therefore contribute to these on-going efforts.

1.3. ***The Goal of the Consultancy***

The goal of the consultancy is contribute to knowledge being accumulated on the impacts of transhumance on the sustainable management of animal genetic resources in general and trypanotolerant breeds in particular.

Specific Objectives:

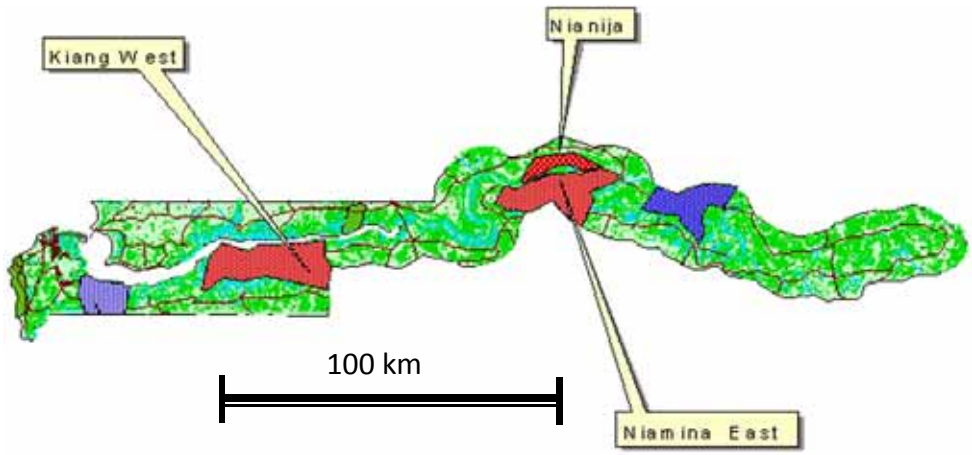
1. To define the diversity of livestock territories in The Gambia with emphasis on Endemic Ruminant Livestock in Kiang West, Niamina East and Nianija Districts
2. To define the transhumant production systems in terms of livestock populations, periods, evolution and the flow map in The Gambia
3. To determine the effects of transhumance on endemic animal Genetic Resources
4. Propose mitigation measures for the identified effects and make recommendations for promoting the implementation of the mitigation measures

2. STUDY METHODOLOGY

2.1 Study Area

The transhumance surveys were carried out in the 3 PROGEBE Gambia primary sites namely the districts of Kiang West, Niamina East and Nianija (Figure 1). The Kiang West district is situated in the Lower River Region 100km from the Atlantic coast. It encompasses the largest national park in the Gambia. The vegetation, which is the savannah woodland type, is known to be one of the thickest in the country and an important quantity of wood fuel sales in the capital originate from this district. (PROGEBE- Gambia Baseline Survey 2010). The tsetse challenge is considered as medium (Agyemang *et al.*, 1997). Kiang West is known to be the district with the lowest population density in the Gambia (Jaiteh and Saho, 2006; UNDP, 2007).

Figure 1: The Study area; Kiang West, Niamina East and Nianija districts



Source: PROGEBE (2008)

The Niamina East district is located in the Central River Region South 200km from the Atlantic coast. Vegetation is characterised by woodlands interspersed with open savannah and fresh water swamp (Agyemang *et al.*, 1997). The area is known to have an important cattle population. During the dry season, the abundant vegetation in the swamp attracts numerous transhumant herds from other districts in search of feed and water (PROGEBE-Gambia Baseline Survey 2010). Past surveys ranked this district as an area of high tsetse challenge (Rawlings *et al.*, 1993; UNDP, 2007).

The district of Nianija is situated in the northern part of the Central Rivers Region 200km from the Atlantic coast. Niamina East is dominated by open savannah vegetation. Precipitation values in this district are the lowest in the Gambia (UNDP, 2007). Further characteristics of the various districts where the study was carried out are presented in Table 2.

Table 1: Characteristics of the project sites of Kiang West, Niamina East and Nianija

	Unit	Kiang West	Niamina East	Nianija
Population	n	14610	19320	8305
Number of households	n	1646	1949	701
Average household Size	n	8.56	10.43	10.43
Annual population growth (1993-	%	1.08	1.93	1.93
Average Rainfall	mm	884	660	650
Cattle	head	5253 (10716)	6646 (6531)	3226 (5932)
Sheep	head	2022(1626)	6066 (5411)	1000 (3320)
Goat	head	6955(7320)	5818 (5147)	1225 (3592)

(1) Source: Gambia Bureau of Statistics (2003); DLS/ITC (1993). PROGEBE-Gambia census (Oct 2009)

For cattle, sheep and goats, both the figures from the 1993 census by the Department of Livestock Services and the recent census by the PROGEBE project are shown in Table 2. Figures in brackets are from the PROGEBE project census carried out in 2009.

Changes in livestock numbers between the 1993 and the 2009 census are varied. In Niamina, there was a decline in the numbers of all the 3 species. Cattle numbers decline by 1.7% while sheep and goat numbers declined by 10.8% and 11.5% respectively. In Nianija, all the 3 species increased with sheep numbers increasing by 232%, goats by 193% and cattle by 83%. In Kiang West, cattle numbers increased by 103%, goat numbers by 5.2% while sheep numbers declined by 19.6% (PROGEBE-Gambia Baseline survey 2010).

In 2013, PROGEBE-Gambia conducted a livestock census. Table 3 below provides a summary of the findings which revealed a cattle population increase of 39.0% in Niamina East and 14.8% in Nianija. There was however a decrease of 13.5% in Kiang West. For the sheep population the 2013 census revealed a decrease of 2, 8% in Kiang West, 20.3% in Niamina East and 49.3% in Nianija. With regards to the goat population the census trend were as follow: 4.7% increase in Kiang West, 6.4% increase in Niamina East and 3.7% increase in Nianija.

Table 2: Species Population in Kiang west Niamina East and Nianija in 2010 and 2013

District	Cattle Population in 2010	Cattle Population in 2013	Sheep Population in 2010	Sheep Population 2013	Goat Population in 2010	Goat population in 2013
Kiang West	10716	9269	1626	1580	7320	7667
Niamina East	6530	9058	5417	4316	5086	5409
Nianija	5932	6811	3320	1683	3592	3727

Source: PROGEBE Livestock Census (2013)

2.1.1 Land use changes and dynamics in Nianija (1984 – 2009)

In addition to information on land availability from the PRA survey, land use change analysis was conducted for Nianija district. The study area covers an area of 138 km^2. The land cover changes were analyzed using remote sensed data. Remote sensing data from Landsat MSS sensor (at spatial resolution of 80 m) were obtained for 1984 and ETM (at spatial resolution of 30 m) were obtained for 2009. All images were geometrically rectified and registered to a common UTM projection with a high accuracy (RMS error below the pixel size, using second-order polynomial), based on ground control points generated from topographic maps(PROGEBE Gambia Land Use Survey 2009).

The land cover maps for 1984 and 2009 were derived by supervised classification of common zone between the two images, using a maximum likelihood classifier, with visual and field interpretation. Nineteen classes were discriminated which includes: settlement, rain fed agriculture, rice field, shrub steppe, herbaceous and shrub savannah, shrub savannah, tree savannah, shrub/tree savannah, savannah woodland, woodland, gallery forest, herbaceous shrub steppe, aquatic herbaceous, mangroves, bare soil seasonally inundated, pond, river and carrières. In 1984 the dominant land cover was natural vegetation that covered about 63% of the land surface, while in 2009 this had reduced to 52%. Agriculture in 2009 covered 41.3% of the land surface from 30.3% as mapped in 1984. The main land cover in 2009 is rain fed agriculture (29%) and there has been a major increase in rice fields.

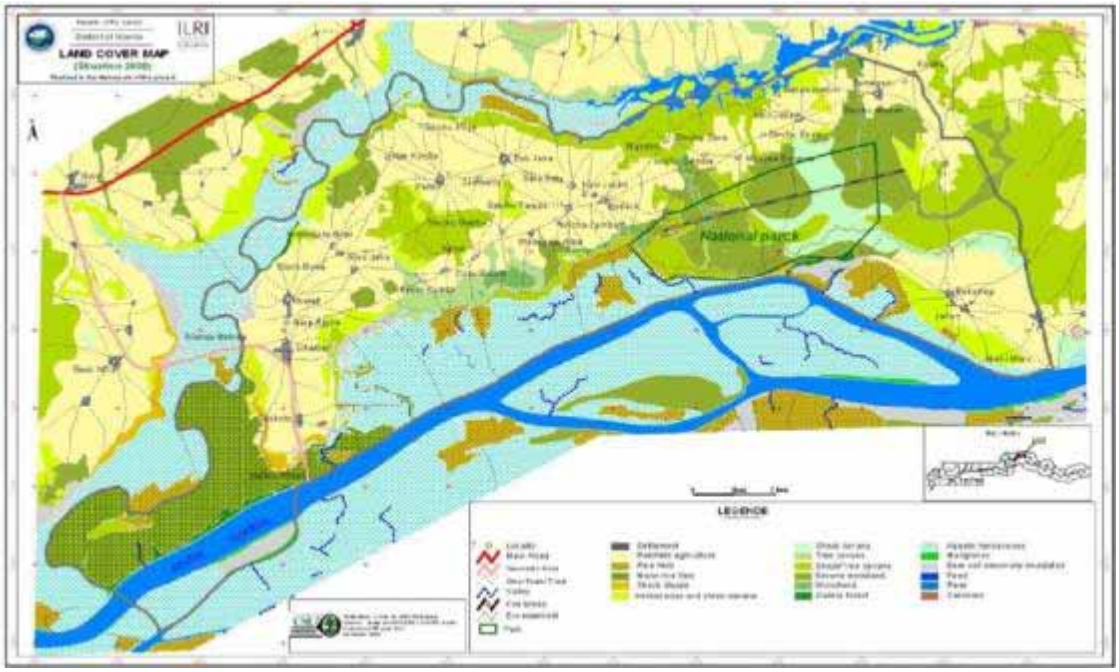


Fig 2: Land use change 1983-2009 Nianija District
Source: CSE,2009, Gambia Baseline Survey (ILRI 2010)

The Gambia Environmental Action Plan (GEAP 2005) which provides the policy framework for sustainable management of the country's natural resources has underlined that blanket implementation of activities with regards to expansion of crop production could have a negative impact on the environment and on biological diversity. The Action Plan further stated that the overall policy of increasing food production without due consideration to environmental and other factors could result in virgin, marginal and fallow lands being put to

crop cultivation at the same time as range lands are reduced, a process that would lead to further degradation of the remaining range lands and a net loss in flora and fauna.

2.1.2 Forest Resources in Kiang west and Niamina East

In both Kiang West and Niamina East, there has been a significant decline in clearing of forest for cropping while in Nianija the situation remained unchanged, according to the respondents. The declining trend in Kiang West was attributed to emigration from the community and the associated decline in crop cultivation. The main reason given for the decline in clearing of forest for cropping in Niamina East was crop pest problem which forced many farmers to locate their farms away from the forest to near the villages. There has not been any change in area of forest cleared for cropping in Nianija because of the strict enforcement of forest law by the forest service officials. This shows that strong enforcement of forest law is necessary for the preservation of forest resources and consequently, the habitat of endemic ruminant livestock (PROGEBE-Gambia Land Use Survey ILRI 2009).

However, the enforcement of forest law did not deter harvest of non-timber products from the forest in Nianija. Similar increasing trend in harvest of forest products was reported in Kiang West. Reasons given for this trend were declining food security due to demographic pressure which compelled more people to consume wild plants and products, and increasing awareness of the commercial value of the forest products and sale. In terms of biodiversity, a declining trend was reported in all the sites. According to the respondents, the decline was attributed to uncontrolled bush fire, hunting of wildlife and variability in rainfall patterns. These results suggest that clearing of forest for cropping is not a problem in all the project sites and the protected areas in both Kiang West and Niamina East have been preserved. However, there has been increase in harvest of forest products. The results also show that enforcement of forest law and regulations is essential to sustainable forest management, which is necessary for the conservation of the habitat of endemic ruminant livestock in the project sites (PROGE GAMBIA LAND USE SURVEY 2009).

2.2 Study Design

The design adopted for this study is based on a cocktail approach combining quantitative and qualitative approaches commonly known as pluralistic design. This design was intended to ensure that all the objectives of the consultancy are adequately and comprehensively addressed in line with the Terms of References (TOR) of the Consultancy as well as in line with the Conceptual Framework of the Consultancy provided by the Regional Consultant.

The Quantitative component of the design was suited to provide better insight into the dynamics of transhumance including revealing possible trends and patterns relating to transhumance production systems and the effects of transhumance on endemic animal genetic resources. Furthermore, it also served in addressing the need for numerative data on transhumance in The Gambia, which at present is either lacking or grossly inadequate.

On the other hand ,the qualitative aspect among other benefits was best suited to provide an indepth answer to keys questions pertaining to the diversity of livestock territories in The Gambia, transhumant production systems and the effects of transhumance on endemic animal genetic resources.

2.2.1 Research Methods

In order to attain the expected results and activities anticipated by the TOR in line with the Conceptual Framework provided by the Regional Consultant, the consultancy employed 3 main research methods comprising: Desk study (literature review), Key Informant Interviews involving consultations with relevant stakeholders/actors using questionnaires and Comprehensive Herd Survey using questionnaires. These research methods are detailed below:

Desk Study: A desk study comprising collection of literature material including cartography review and, collation and synthesis of secondary data from project reports and other available sources pertaining to the diversity of livestock in the Gambia with emphasis on Endemic Ruminant Livestock in Project sites

Key informant interviews/ Consultations: This exercise entailed drawing up of a list of key stakeholders in endemic livestock production and the environment in the study sites. The list included Veterinarians, Livestock Assistants, Environment Field Staff operating at project sites, Village and District Authorities, Regional Livestock Authorities, Members of the Community, farmers, NGOs, civil society and the private sector ,

Herd Survey: This exercise entailed the conducting of a comprehensive herd survey using a questionnaires. Sample size was statistically determined to ensure that the results of the survey are representative of the entire herds in the project sites.

2.2.2 Sampling Strategy

The sampling strategy for both the stakeholders interviews/consultations and the comprehensive herd survey was aimed at addressing the various objectives that were set. To achieve this, due consideration was given to what we wanted to know using each of our methods, what's at stake, what will be useful, what will have credibility and what can be done with available time and resources.

In determining the sample size for the comprehensive herd survey in which we envisaged to collect both quantitative and qualitative data, due consideration was given to the endemic ruminant population in the study sites, the number of herds and estimated prevalence of transhumance (in the absence of estimated prevalence data, a design prevalence of 50% was used). 95% confidence rate and +-10% confidence interval was used in the determination of sample size. The herds that were included in the survey were selected at random to ensure statistical inference.

For the Key Informant Interview (Qualitative Stakeholder Survey), the number of villages in the districts was taken into account, using 95% Confidence level and +- 5% confidence internal to ensure representativeness for the entire district. The participating villages were carefully selected to further ensure that villages with history of participation in transhumance in one way or the other were included in the survey. Furthermore a cross section of the stakeholders including District Authorities, Village Heads, Livestock Officers, Herd Owners, Small Ruminant Farmers, Environment/ forestry officer were carefully selected to provide in-depth sight into the issues involve.

2.2.3 Sampling frame

Table: 3 Survey sampling frame

DISTRICT	No. of Herds	Sample Size for Herds	No. of Villages	Sample size for Villages
Kiang West	132	60	30	23
Niamina East	170	60	34	24
Nianija	138	56	28	22

2.2.4 Training of Survey Team Members on the questionnaires

A two-day training on the questionnaires was conducted for the filed staff who were deployed to conduct the survey. This served to harmonize the understanding of the questions by all those who were involved in the dispensation of the questionnaires. The questionnaires were pretested.

3 field staff per district totalling 9 survey team members were trained and deployed to the field for the conduct of the survey. The survey in the districts lasted foev10 days.

3. LITERATURE REVIEW

3.1. Contribution of Livestock to the household economy

The livestock sector in The Gambia contributes 29.6% to Agricultural GDP and 8.6% to National GDP. The activities of the various livestock value chains - production (of cattle, sheep, goats, pigs and poultry), processing, marketing and services - provide livelihood opportunities to both rural, peri urban and urban inhabitants in The Gambia. Cattle contribute greatly to meeting the national demand in meat and milk. At household level, cattle ownership has previously been associated mainly with men but recently ownership of cattle by women has been on a gradual increase, though the latter's animals are kept in herds owned by men, primarily their husbands. The women mainly acquire cattle by exchanging small ruminants for cattle. The ratio is around 5 sheep and up to 7 goats respectively for 1 head of cattle. Ownership of cattle by women is very important at the household level given that the women are responsible for the management of the milk derived from the herds. They allocate the quantities for household consumption and for commercialisation in terms of fresh, fermented and other milk products (Livestock Sector Review 2012)

Small ruminants comprising sheep and goats contribute to household food and nutrition security and as sources of income for small scale producers mainly women, who are predominantly the owners and managers of these species.

In The Gambia small ruminants have significant socio cultural importance particularly in Muslim naming ceremonies, marriages, charities and annual feast of Eidel Adha (Livestock Sector review 2012)

Two distinct livestock production systems can be observed in The Gambia comprising the traditional production systems and the improved/modern production systems. These are detailed below.

3.2. Livestock production in the Gambia

In The Gambia, the main species kept by livestock farmers are cattle, sheep, goats, poultry, pigs, horses and donkeys. Table x below gives the number of household owning different livestock species per region.

Table 4: Number of households owning livestock by region

Region	No. of households reporting ownership	Cattle	No. of households reporting ownership	Sheep	No. of households reporting ownership	Goats	No. of households reporting ownership	Pigs	No. of households reporting ownership	Chickens
Total	**30,927**	**398,472**	**29,997**	**143,939**	**50,923**	**302,878**	**753**	**,6385**	**33,403**	**1,870,376**
WCR	4,490	39,935	5,773	27,517	13,378	70,381	444	3,627	12,840	911,117
LRR	3,431	39,613	3,141	12,324	6,209	33,589	95	693	3,268	149,755
NBR	7,755	75,867	5,872	24,217	11,190	65,082	74	1,216	5,953	333,426
CRR	10,582	172,672	9,687	53,289	12,705	78,160	119	800	8,288	332,634
URR	4,670	70,385	5,524	26,591	7,441	55,666	21	47	3,054	143,443

Source: Agricultural Census 2011/2012

Cattle: The 2011/2012 Agricultural Census reported the cattle population at 398,472 heads of which 392,288 are N'Dama breed and 6184 are Zebu type Gobra breed and crosses between the Gobra and N'dama. CRR has the highest cattle population which is reported at 192,772 head. The growing demand for milk products due to population growth and increased urbanization has presented opportunities for the development of small holder commercial peri urban milk production systems. In this system, pure bred temperate cattle breeds (Friesian and Jersey), estimated at 100 heads and F1 cross breeds are raised at farm level in the WCR and NBR for milk production.

Sheep: The 2011/2012 Agricultural Census reported the sheep population at 143,939 head of which 139,296 are of the Djallonke breed and 4,643 are Sahelian breed (Touabire or Peulh Peulh, Bali Bali and Ladoum and crosses). It is worth noting that, the census figure being the most recent official figure is significantly at variance with the National Agricultural Sample Survey of 2010 which puts the figure at 194,722 and the FAO STAT figure of 251,000 in 2010. The Animal Health and Production Services of The Gambia have noted the conflicting sheep population figures reported by the quoted source and are of the opinion that the 2011/2012 Agricultural Census figure is an underestimate.

Goats: The 2011/2012 Agricultural Census reported the goat population at 302, 878 head of which 296,939 are of the West African Dwarf breed and 6051 are Sahelian breed. CRR has the highest goat population which is reported at 78,160.

3.2.1. Traditional Production Systems

The vast majority of cattle are housed in open kraals or pens both during the dry and rainy seasons. A limited number of households (8%) use kraals or pens with roofs. Goats benefit from better housing conditions, especially during the rainy season when 67% of households use kraals or pens with roof or stable with roofs to accommodate their sheep/goats(PROGEBE Gambia Baseline Survey 2009).

Cattle are generally kept in herds and are rarely individually owned. It is common for Cattle owners to pool their animals and entrust them to one herder; it is therefore not surprising that herd sizes are in most cases quite large ranging from 10 to 150 herds. There are two distinct herd management practices with herds managed by family members as in Western and Lower River Divisions and contract herder management in Central River,North Bank and Upper River Divisions.

Under the contract-herder system, a single herd is entrusted to an individual herdsman, in most cases of the Fula tribe. The contract herder is normally paid in milk; with morning milk belong to the herd owner and the evening milk to the herdsman. This remuneration is normally topped by the payment of an amount of money. Cattle within the herd are not housed, they are tethered in open kraals from evenings until morning near the village or in fallow fields. It is during this period when cattle are tethered that milking takes place (i.e. during the morning and evening).

The herds obtain feed from the traditional grazing areas which are generally inadequate in terms of watering facilities and fodder. Furthermore, grazing patterns are not well planned leading to over-grazing. Traditional grazing areas are communally owned by livestock owners and the local communities. Herders during the dry season would trek their animals for very long distances primarily in search of water and fodder. The dry season therefore represents the most difficult season in terms of feed and water for cattle. At the peak of the dry season due mainly to high incidence of bushfires depleting the range resources and drying up of the natural watering points, cattle tend to be severely emaciated and this condition when compounded with disease results in high mortality rates (primarily adult cattle). During this time of the year a significant number of the national herd (primarily from LRR, CRR, and URR) migrate to the Cassamance region of Senegal for grazing purpose

Almost all households make use of natural pastures to graze their cattle, sheep and goats. Groundnut hay is the second most important feed resources in terms of proportion of households using it. The most widely used feed concentrate is cereal bran given to cattle, sheep and goats. In general, it is worth noting that the use of cakes and other concentrate feeds in not common which reflects a feed regime essentially based on roughages. On average, 31% of the households owning livestock experienced acute feed shortages in the past 10 years. From the three sites, Nianija reported the highest number of households experiencing acute feed shortages (36% compared to 32% in Kiang West and 27% in Niamina East).

There is almost no controlled mating. Households that reported controlled mating were 2.3%, 0.8% and 0% for cattle, sheep and goats, respectively. Bulls, rams and bucks are present all year round in the herds/flocks and births occur all year round with a seasonal pattern of parturitions. None of the interviewed farmers had used

artificial insemination over the last 5 years (PROGEBE Gambia Baseline Survey 2009)

Small ruminants are generally kept in flocks in the compounds of the owners. During the rainy season, however it is common to find communal village flocks entrusted to shepherds. Animals that are not pooled into this communal village flocks are mainly tethered during the day to avoid damage to crops.

Few improved husbandry practices are employed. During the dry season the "free range" extensive system of management is practiced with animals left to roam around the village grazing on available grasses, shrubs and scavenging on domestic agricultural wastes. Housing in the form of simple temporary sheds are constructed within the compound for sheltering the animals at night. Supplementary feeding is generally provided especially to lactating ewes, nannies and to fattened stock. According to the Agricultural Census (2002) most of the goats (74%) and 47% of the sheep are managed by women. Despite the high female engagement in the activity however, most of the marketing is performed by men.

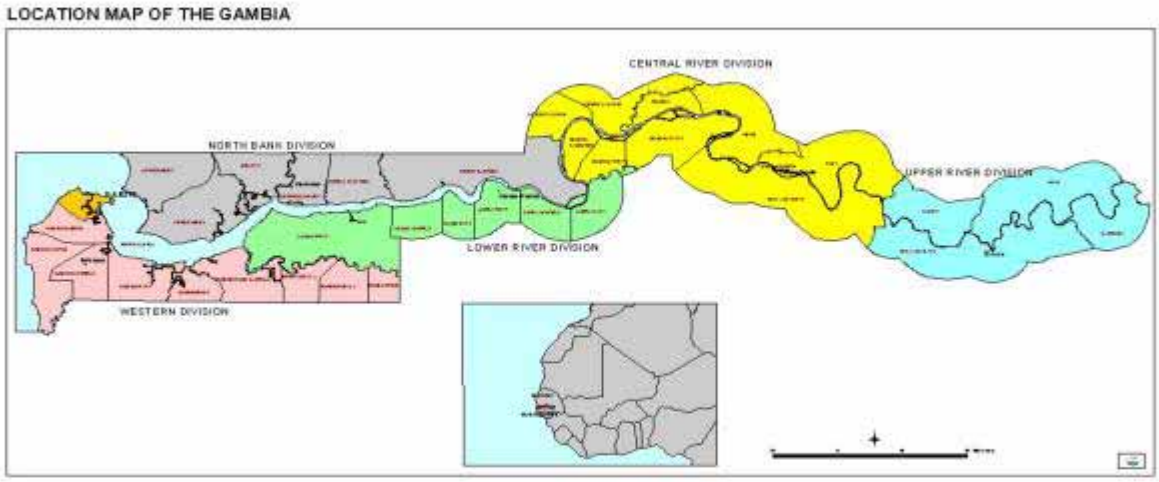
3.3. Administrative Setup

The Gambia is the smallest country on mainland Africa, bordered to the north, east and south by Senegal. In the west, it has a small coast on the Atlantic Ocean. Its borders run roughly parallel to The River Gambia, which flows through the country's centre and empties into the Atlantic Ocean. The countries width is approximately 30 km and the length from west to east is approximately 375 km. Its size is 11,300 km^2 (10,000 km^2 land and 1,300 km^2 water).

The country is divided into six agricultural administrative divisions namely: Western Coast Region (WCR), North Bank Region (NBR), Lower River Region (LRR), Central River Region-North (CRR-North), Central River Region-South (CRR-South) and Upper River Region (URR). The PROGEBE sites are located in Kiang West District of LRR, Niamina East in CRR-South and Nianija in CRR- North. All three sites fall under the rural areas and have substantial animal populations and agricultural activities

The regions are headed by Governors appointed by the President of the Republic. The second administrative tiers constitute the districts. There are 37 districts each headed by a Chief also appointed by the President of the Republic. Below the districts are villages of which there are 1,968. The villages are headed by village heads bearing the title of "Alkalo". Livestock keeping is prevalent in almost all villages of The Gambia. The 2011/2012 Agricultural Census has reported 88.9% of the villages rearing cattle, 95.4% rearing small ruminants and 11.9% having commercial poultry farms mainly small to medium scale. Traditional poultry rearing is carried out in all the villages in The Gambia. In addition to the regions there are two Municipalities i.e. the city of Banjul and the Kanifing Municipality (KMC).

Figure 3: Map of The Gambia showing Administrative Regions



3.4. Vegetation of the Gambia

The Gambia's vegetation represents a transition between that of the moist tropical rainforest to the South of the Continent and the dry Savannah to the North. Two major vegetation types have been identified, namely: The Guinea Savannah and the Sudan Savannah. In the Western part of the Country, the natural vegetation is composed of Guinea Savannah type, which changes to the open Savannah towards the East. The Guinea Savannah type consists of a denser type of vegetation with more trees than the Sudan Savannah type.

Along the banks of the river and its tributaries starting from the Estuary to somewhere around the middle part of the Country, the natural vegetation consists mainly of mangroves. Mangroves seem to be the only vegetation type, which have adapted successfully to the saline conditions present within the zone.

The Gambia's natural vegetation has been greatly modified by farming and annual bush fires, which are a common feature during the long dry seasons. With the exception of the protected areas and areas under mangroves, the Country's vegetation has been greatly modified over the years.

One of the greatest contributions to the deterioration in the natural vegetation within the Gambia region is over grazing by livestock. It is believed that traditionally, there was a balance between herding and farming. During the rainy season, livestock was moved into areas were annual grasses were grazed. As the dry season approaches, livestock was moved into regions of perennial grasses. These regions of perennial grasses were farmed for millet, sorghum and peanuts. A symbiotic relationship existed between the Pastoralist and the farmer. The livestock feeding on perennial grasses in fallow fields, the fallow cycle

lasting as long as 20 years. In return, the farmer received dung and urine from cattle that helped to enrich his soils. Due to the intensification of groundnut farming and the expansion of rice cultivation, an unbalance system began developing. Fallow cycles decreased and fallow areas were reduced. This deprived the pastoralist of grazing lands. Annual grasses became quickly over grazed.

It is believed that a key solution to the problem of over-grazing is to develop a long-term program to change traditional practices of herds, from maintaining large un- productive herds to raising smaller more productive herds that are turned over after maximum growth rate has been attained. The resolution of over-grazing in the Gambia may go a long way in naturally re-vegetating the country.

3.5. Range resources

Base on the ecosystem, Livestock grazing areas in The Gambia are identified by four principal ecosystem and whether or not the land has been cultivated. Grazing practices are determined seasonally: 1) Rainy season 2) Harvest season and 3) Dry season.

The four ecosystems are:

I. Cultivated lands: Grazed by livestock following harvest, the forage on these lands is crop residues with annual forbs and grasses.
II. Fallow Lands: Grazed by all classes of livestock, burned by bush fire, the forage on these lands is annual grasses and shrubs
III. Forest: Accessible when cultivated, graze year round and swamp land are not available. Burned by bush fire and characterized by low productivity. The forage is weeds, annual grasses, trees and shrubs.
IV. Swamp lands: These constitute dry season gazing areas characterize by high productivity. Inaccessible during the rainy season and high river flow. The forage is annual perennial grasses and shrubs.

Furthermore, the range resources of the country could also be divided into two broad categories:

a) Upland Range b) Lowland Range

(a) UPLAND RANGE

This includes closed woodlands, open woodland, tree and shrub savannah with and without cultivation. The closed woodlands cover an area of 20,900 hectares characterized by light trees with crown cover exceeding 50 percent. The herbaceous layer consists of annual and perennial grasses. Closed woodlands are found mostly in the South west of the country decreasing in numbers progressively eastwards. The high tree density may in some areas limit livestock grazing. The carrying capacity is between 2-6 hectare per animal/unit.

The open woodlands and tree/shrub Savannah cover an estimated area of 405,133 hectares and are the most important grazing areas. The Canopy cover is less than 50 percent in the open woodlands and 10

percent in tree/shrub Savannah. The annuals found in this category provide early feed supply immediately after the onset of the rains when livestock are nutritionally stressed. The open woodlands and tree/shrub Savannah are grazed on most because of the large area they cover and the diverse nature of the vegetation. The shrub Savannah areas are also subjected to yearlong grazing, the dominant annual grasses provide feed early in the wet season. The Savannah is also the most likely to be cleared for crop cultivation.

(b) LOWLAND RANGE

The lowland range is known as uncultivated swampland or flood plain, they cover 70,393 hectare and contribute 19 percent of all dry season feed. They are characterized by a high water table and flooding during the wet and early dry seasons. Grazing is only possible in these areas in the second half of the dry season. Areas, which are not subjected to flooding, provide valuable grazing during the wet season. Flood plains are also a source of water for livestock during the dry season.

3.6. AGRO ECOLOGICAL ZONES (AEZ)

According to FAO land use planning project (TCP/Gam/6715), 6 AEZ have been established for the Gambia. The six AEZ^{s} found in the Gambia have the following characteristics.

AEZ 1 (Yundum - Pirang area)

This zone covers the Western part of the Gambia. (Western and Central part of NBD) and Kombo North, Central, East, Foni Brefet and Foni Bintang Karanai districts. The growing period last 135 days and begins somewhere between June 15th and 30$^{th.}$ The annual cumulative rainfall is reported to be over 800mm.

The natural vegetation within this zone is the thickest in the entire Country. On the uplands, Acacia, M mahogany and other species are common. Within the lowlands the dominant vegetation consists of oil palms (Elaeis guineensis).

AEZ 2 (Bakindik – Kerewan – Jenoi area

This zone represents the biggest AEZ in the Country and covers almost the whole of North Bank and the top Northerly part of WD. The length of the growing period is between 120 – 135 days with the start of the growing season beginning around June 15 – 20. The annual cumulative rainfall is reported to be between 700 – 800mm. The vegetation has been heavily degraded by human activities and consists mostly of grasslands with few interspersed trees. Native tree species include adansonia digitata (Baobab) Parkia biglobosa and Cardylla Pinnata (Bush Mango).

AEZ 3 (Bwiam – Kanjibat area)

This is the smallest zone and covers the extreme Eastern part of WD. It covers only 3 districts namely: Foni Kansala, Foni Bondali and Foni Jarrol. The length of the growing period is less than 120 days with the start of the growing period after June 15. The cumulative rainfall is between 600 and 700mm per annum. The vegetation consists of extensive grasslands with shrubs and few trees. Oil palms are found along the tributary valleys.

AEZ 4 Kaur – Janjanbure Sapu area)

With the exception of Niani and Nianija districts, this zone covers the entire Central River Division

stretching on both sides of the River Gambia. The zone is characterised by having a growing period of between 120 – 135 days. The growing period however starts before June 15. The cumulative rainfall is between 650 – 750mm. The natural vegetation has been described as the Savannah type, dominated by grasses and riparian forests. Niamina East District falls under this Agro-ecological Zone.

AEZ 5 (Kuntaur area)

This agro ecological zone covers mainly the Northern part of the Central River Division and includes the Niani, Nianija and parts of Upper Saloum districts. The length of the growing period for this AEZ is slightly less than 120 days with the start falling where in the first part of June. This zone has a cumulative rainfall of about 600mm per annum. The natural vegetation of this zone consists of open Savannah with grasses and shrubs dominating.

AEZ 6 (Basse - Fatoto area)

This Agro ecological zone corresponds entirely to Upper River Division region and covers both sides of the river. This zone is characterised by having a growing period of over 135 days and the start of the growing season around the first half of June. The cumulative rainfall is between 700 800mm per annum. The natural vegetation in this zone consists of grasslands with scattered trees. The vegetation in this zone has been heavily modified through human interference in the form of cultivation and bush fire.

3.7. Legal Framework for Sustainable Management of Natural Resources (Land, Forest, Water and Livestock) in Study Area

PROGEBE-Gambia has facilitated the preparation and actualisation of a set of agreements within local communities at project sites on how to sustainably manage their natural resources. These agreed set of local rules and regulations referred to as local conventions (by Laws), are in conformity with national legal framework. It was envisage that the use of these conventions will support the communities in their drive to enforce regulations on control of bush fires, illegal cutting of trees, manage use of water and prevent overgrazing. It is strongly believed that good environmental friendly practices must be used in a holistic way and linked to the capacity of the land. To achieve this, the land use must also be linked to the interaction between activities and the interest of the different users. The community should therefore develop skills to manage their resources and it implies that communities should be empowered to control resource use base on community consensus.

The local convention on sustainable management on natural resources seeks to address the possible causes of environmental deteriorations which include among others: land conversion, incompatible and sustainable land management, overexploitation, illegal cutting of trees, bush fires and hunting. These problems all stem from lack of planning and of control over access to natural resources. This lack of planning and control affects the exploitation of forest and the uncontrolled clearing for agriculture at the expense of rangeland.

It was envisaged that the communities will work in partnership with government technical services and extension services who will support, capacitize and monitor their activities which include among others the protection and improvement of rangelands, and livestock feed resource base, their preservation and

utilisation, good livestock management practices, animal health management and commercialisation of livestock marketing and support the development and implementation of local convention.

The conventions on sustainable management of natural resources are bold step taken by the communities to take charge of the efficient, equitable and sustainable utilization and exploitation of their natural resources. They provide an avenue at community level to regulate the root cause of environmental degradation and overexploitation of natural resources. The regulation of transhumance at district level fits very well within the framework of the local conventions. This has already started to take effect in both Nianija and Niamina East. However to enhance implementation and enforcement of compliance, a lot more needs to be done in terms of sensitization of the entire community in general and of the major stakeholders in particular.

3.8. Transhumance in the Gambia

Transhumance is defined as a system of animal production characterized by seasonal and cyclical migration of varying degrees between complementary ecological areas and supervised by a few people, with most of them remaining sedentary. Transhumance is based on the use of different and complementary ecological niches in which the transhumant herders organise their lives and ensure the viability of their animal stock. The back-and forth movement of animals and people occurs within a limited space and in most cases, across borders(Livestock in Sahel and West Africa Policy Briefing No.3).Transhumant herds usually move from areas that are difficult, unbalanced and changeable, such as Sahel and agro-ecologically vulnerable zones. It is primarily a response to ecological constraints but it can also stem from agricultural, health, economic and socio-cultural factors. Its development is however hindered by multiple constraints include among others include reduced access to Natural Resources (water and pasture; Competition between different users of areas (mainly farmers, pastoralists and fishermen); development of private holding for ranching, irrigation and production of export crops and; development of protected areas (forests, game reserves).

Transhumance can take various forms depending on the period and context. It is a very important strategy in livestock in the Sahel where it is practiced for very long time (FAO). We can distinguish the following two types of transhumance (Abbagana and Youla, 2009).

Short range transhumance: It aims at taking advantage of the crop residues or to gain access to better pasture lands or at giving way land temporarily for crop production. This form of transhumance is widespread and it helps to reduce conflicts with farmers. Very often, mobility is limited within the national borders but they can happen across national borders, mainly for pastoralists living near boundaries.

Long range transhumance: In West Africa, it happens in the dry season and does not correspond to a strict plan by its modalities, its organization and its frequency. As the name suggests, this type of transhumance involves livestock movements of big magnitude (north-south and up on return south-north direction). They travel distances of several hundreds of kilometres, and frequently go beyond the borders of their country of origin. This type of transhumance involves above all cattle that require more important quantity and quality forage than goats or sheep.

According to findings from the Household survey conducted by PROGEBE- Gambia in 2009, transhumance is the most common resilience strategy used by herders in The Gambia to cope with shortages of feed, water and grazing land. A survey conducted on transhumance in PROGEBE Project sites by Ceesay (2012) reported there are various important factors associated to demographic and environmental parameters that are the driving forces to transhumance. Increases in human population densities led to loss of rangeland to farming while increases of livestock numbers resulted to overstocking and overgrazing. The loss of trees, overgrazing and poor farming practices and frequent uncontrolled bush fires all contributed to soil degradation and loss of bio-diversity of pasture species.

It is undoubtedly of great socio-economic benefit to the local economy, improving livelihoods and alleviating poverty as a result of increase in animal production and crop production due to improved soil fertility by manure from the animals.

In a study conducted by Njie in 2012 in Nianija District, Central River Region South, on impact of transhumance in The Gambia on disease control, ecology and its economic benefits, he observed that the main reasons for transhumance in the first place were in search of feed and water and in some instances greater grazing space in areas where there is high livestock population and the area is small e.g. Nianija District. The study stated recognised transhumance as an integral part of livestock production in the central and eastern part of the Gambia. Animals have become accustomed to the movements at particular times of the season such that they move themselves if owners try to delay their departure. The study further revealed there is convergence of transhumant herds from within the Gambia and from Senegal into Central River indicating that most of the transhumance herds converging into the Central River Region are from within the Gambia but there were other animals coming from the northern and southern parts of Senegal.

The study identified the practice of two types of two types of transhumance; dry season and rainy season transhumance. During the rainy season animals move mainly to avoid crop damage and seek greater space for grazing. This is a shorter period of up to 4 months. During the dry season animals moves in search of feed as the grasses dried up and water rainy ponds also dries up. Many of the animals move during January and February and many on average stay away between 4 and 5 months. Most of herds are moving short distances taking them mainly one day to arrive to their destinations. Few of them take longer making stops along the way. The results of the study conducted by Njie further revealed that transboundary diseases such as Foot and Mouth Disease (73%) and Lumpy Skin Diseases (8%) were being spread by mobility animals. 28% believed that these diseases originated from Senegal. Trypanosomiasis was the most common disease encountered (85%). Pastoralists were spending on the USD370 on healthcare per annum on their herds.

Njie (2012) also revealed among others that the practice of transhumance serves a lot of benefit to host communities. They provided organic manure at a time when the soil fertility is depleting; milk is available, access to livestock for draught and meat and host families are provided with domestic labour. Some of the disadvantages included disease transmission, theft, over grazing and deforestation as herders cut trees for their animals. Feed was reported to be enough in the wetlands (aquatic weeds) but needs to be

complemented with grasses in the forest parks and farmed areas as animals stays around villages for about two months while they wait for the completion of the rice harvest.

Considering the geographic location of The Gambia being completely surrounded by Senegal except for an opening to the Atlantic Ocean and also considering the very close socio -economic, cultural and family ties that exit between the two counties, it is logical that a lot of movement of livestock takes place between the two countries which mostly goes on unhindered. This fact was corroborated by a study conducted by FAO on trans-border transhumance in West Africa which stated that the flow of cattle between Senegal and The Gambia is easier in principle compared to some of the neighbouring countries in the sub region. There is only disease control verification that is done with the presentation of a certificate issued by the veterinary services of the animals' place of origin. But this relative flexibility is applied if the cattle are meant for slaughter; The situation is different, indeed, from transhumant livestock in search of pasture land. While Gambia has water resources superior to those in Upper Cassamance, it worries about the impact of grazing on the farm. This leads the Gambian authorities to show some understanding towards Gambian farmers protesting against the Cassamance pastors who take their cattle graze in the Gambia during the dry season.

At sub regional level ECOWAS has made strives to enhance the regulation of cross border transhumance through the ECOWAS Protocol on transhumance which allows herdsmen within the West African sub-region free access to countries in the sub-region with their livestock, provided they have valid health certificates covering their animals and use specific routes or corridors assigned by the state to specific grazing reserves. The protocol does not warrant the destruction of farmlands by the alien herdsmen or the violation of the country's laws.

However, the practice of transhumance in the Gambia is not without challenges which are mostly centred on equitable and sustainable utilization of natural resources for both sustainable livestock and crop production as well as challenges related to spread and control of Transboundary Animal Diseases (TADs) such as Foot and Mouth Disease (FMD), Lumpy Skin Disease (LSD) and Contagious Bovine Pleuropneumonia (CBPP). The resurgence of CBPP in Senegal and in the Gambia in 2012 after 41 years of absence of the disease in The Gambia, it's devastating impact on farmers livelihood through mortalities of their cattle and the huge cost it is now taking to go back to the pre 2012 status quo clearly indicates the immense importance of cross border surveillance and harmonisation of regulations in view of the risk posed by transhumance between the two countries. Besides The Gambia, Senegal shares borders other countries some of which are CBPP endemic.

The livestock policy of the Gambia has not fully responded to some of the emerging challenges surrounding the equitable and sustainable management of the country's range and livestock feed resources base including the regulation of transhumance and cross border transhumance as well as the encroachment on traditional lowland grazing areas for rice cultivation. There is therefore the need for a more sustainable utilization of limited resources for both crop and livestock production. The efficient management of dual purpose lands for grazing, crop production and rice cultivation provides a viable alternative. Transhumance if controlled, properly managed and regulated could provide the key to sustainable utilisation of dual purpose lands.

This should be done within the framework of existing and emerging national and regional initiatives in terms of building on best practice, policy coherence and policy harmonization.

In view of the above, a brief outline of the ECOWAS framework for regulation of transhumance in West Africa is provided below.

3.9. ECOWAS Framework for Regulation of Transhumance in West Africa

At sub-regional level, ECOWAS has set up a Sub-regional legal arrangement regulating cross-border transhumance (Decision A/DEC.5/10/98, October 1998). This decision is supported by the rule C/REG.3/01/03 adopted in 2003 for the implementation of the regulation of transhumance between ECOWAS member states. The decision and rule define the conditions for movement of livestock, looking after animals and hosting transhumant cattle.

The International Transhumance Certificate of (ITC) of ECOWAS is a tool developed to implement this framework. This “laissez-passé» for transhumant and breeders is among others designed to ensure the sanitary conditions of local herds, give information to people in reception areas about the arrival of transhumant animals and time to prepare and respond.

The instrument also guarantees, through the laws of the receiving country, that the rights of non-resident herders will be respected. At the same time, non-residents transhumant must comply with the national legislation of the host country, including regards access and use of forest areas, wildlife, water points and pasture.

A conflict resolution mechanism is put in place through a Conciliation Commission. This consists of herders, farmers, local authorities and others concerned stakeholders.

Despite the framework being both simple and comprehensive, effective implementation is challenging. Several constraints have been noted which should be taken into account when designing new systems to manage cross-border transhumance. Herders often find that migration routes and transhumance corridors in the reception areas are occupied by farmers or villages. Administrative impediments, delays, and illegal taxation of pastoralists are common. Communities in reception areas blame migrating herders for damage to crops the over-exploitation of protected areas (through hunting, fishing and overgrazing.

4. FINDINGS

4.1 .1 Livestock Production And Productivity

Based on the 2013 Livestock Census conducted by PROGEBE-Gambia, the cattle population in the 3 sites are as follow: Nine Thousand Two Hundred and Sixty Nine heads of cattle (9269) in Kiang West which shows a decrease of 2.8% from the Ten Thousand Seven Hundred and Sixteen (10716) heads of cattle in 2010, Nine Thousand and Fifty Eight (9058) heads of cattle in Niamina East which represents an increase of 39.0% from the Six Thousand Five Hundred and Thirty (6530) heads of cattle in 2010 and Six Thousand Eight Hundred and Eleven (6811) heads of cattle in Nianija which represents an increase of 14.8% from the Five Thousand Nine Hundred and Thirty Two (5932) heads of cattle in 2010 as indicated in table 5. The increase in cattle population in project sites is attributable to increase births and less mortality.

Niamina East has the highest number of herds at 170 herds, followed by Nianija with I38 herds and King West with 132 herds.

With regards to average herd population, the findings of quantitative herd survey are as follow: 76 heads of cattle per herd in Kiang West, 63 heads of cattle per herd in Nianija and 57 heads per herd in Niamina East. This stands above the national average for The Gambia (55 heads per herd). The findings also revealed great variability in herd population (number of heads per herd) in all the 3 districts with the greatest variability observed in Niamina East district which also has the smallest herd with only 9 heads of cattle as well as the largest herd with 230 heads of cattle with herd size standard deviation of 42.1 for the district.

The annual off-take rate in all the 3 districts remains low with Kiang West having registered the lowest off-take rate of 4.5%, followed by Niamina East with 6.9% and Nianija with 8.9%. The off-take rate in all the 3 districts is below the national average of 12%. The unwillingness of Gambia cattle owners to sell the unproductive cattle in their herds which is evidenced by low off-take rate registered in the survey is one of the contributing factors to undue pressure on range resources which limits the carrying capacities of rangelands thus contributing to overgrazing and environmental degradation.

According to the findings of the quantitative herd Survey, the annual mortality rate of cattle which is the annual instantaneous hazard rate of natural death (excluding slaughter) in the 3 districts are as follow: 10 % in Nianija, 7% in Niamina East and 6.9% in Kiang West. The average mortality for the 3 districts combine is 7.96%. This compares very favourably with the mortality rates registered during the PROGEBE-Gambia Baseline Report (ILRI 2010). The results of which are presented as follow: Mortality for female and male cattle over the age of 12 months was 5% and 6.9% respectively. For cattle below 12 months, the mortality rate was higher at 22.6% for females and 19.9% for males. The Projects investment in disease control and prevention programmes in partnership with the Department of Livestock Services, coupled with the Project's numerous capacity building efforts in animal production could be considered as contributing factors to the lowering of mortality rates in Project sites.

However, despite the ongoing efforts and some success registered by PROGEBE and the Department of Livestock Services in disease control, disease remains a substantial contributor to low livestock productivity and high mortality in livestock populations in project sites. According to herders' response on the possible causes of mortality, Contagious Bovine Pleuropneumonia (CBPP) has been reported as the principal cause of mortality in Nianija and Niamina West. There has been a resurgence of the disease in The Gambia since 2012, after 41 years of absence in the country. An outbreak of CBPP was reported for the first time in November 2012 in Niamina Dankunku District, Central River Region a district well known for being a major destination zone for transhumant herders from Niamina East and Nianija Districts as well as for transhumant herds from the Cassamance Region of Southern Senegal. With the support from Food and Agricultural Organisation (FAO), the Government of The Gambia, through the Department of Livestock Services and its partners has been implementing a Project on the control of CBPP which has to a great extent succeeded to halt the spread of the disease.

Table 5: District Cattle Pop, herd Sizes, Off take and Mortality Rates

District	Cattle Pop in 2010	Cattle Pop in 2013	No. of Herds	Ave. Herd Pop.	Median Herd pop	Min Herd Size	Max Herd Size	Annual Off take Rate in %	Annual Mortality Rate in %
Kiang West	10716	9269	132	76	71	18	180	4.5	6.9
Niamina East	6530	9058	170	57	85	9	230	6.9	7
Nianija	5932	6811	138	63	43	24	170	8.9	10

4.1.2 Milk Production Parameters

As indicated in Table 6 below, the average number of milking cows per herd is 18 milking cows/herd in Kiang West, 17 milking cows/herd in Nianija and 15 milking cows/herd in Niamina East. Milk yield in all the 3 districts continues to be low. The average daily milk yield during the peak period (rainy season) is 1.5 litres per milking cow in Nianija, 1.3 litres per milking cow in Kiang West and 1 litre per milking cow in Niamina East. During the low period (dry season), the average daily milk yield per milking cow is as 0.5 litres in Nianija, 0.4 litres in both Kiang West and Niamina East. This result indicates that local milk supply is highly seasonal with the highest production during the rainy season when fodder is abundant.

The total milk yield for the rainy season could be estimated at 180 litres for the 4 months of the rainy season and 120 litres for 8 months of the dry season. According to the findings of the 2010 PROGEBE-Household Baseline Survey, the mean milk yield for the dry season and rainy season was 200 litres and 170 litres respectively, with significant standard deviation as presented in table 7.

Table 6: Milk Production Parameters

District	Average No, of Milking cows per herd	Rainy season Average daily Milk Yield per cow (litres)	Dry season Average Daily Milk Yield per cow (litres)
Kiang West	18	1.3	0.4
Niamina East	15	1	0.4
Nianija	17	1.5	0.5

Source: PROGEBE-ITC Transhumance Survey (2014)

Table 7: Milk production per cow per season, N'dama cattle

Season	N	Mean	Std. Dev.	Min	Max
Dry season	21	200	117	60	480
Rainy season	25	170	84	52	360

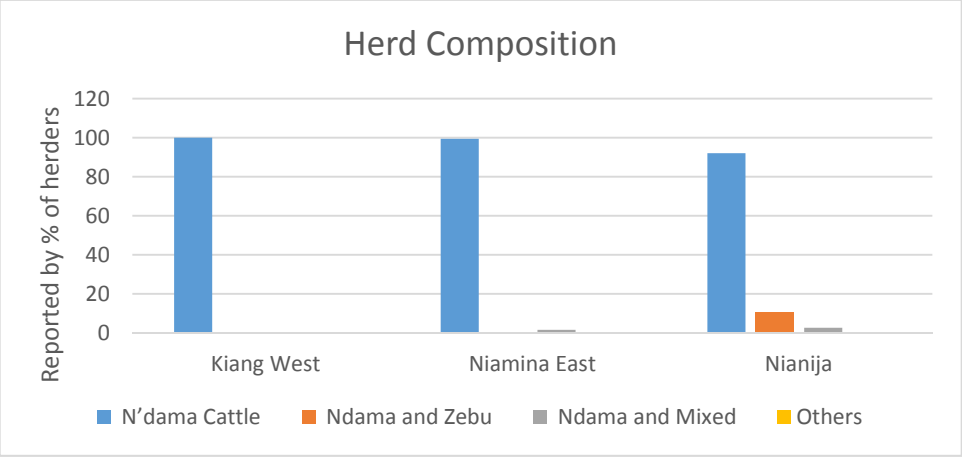
Source: PROGEBE-Gambia household survey data

4.1.3 Breed Composition of the Herds

As shown in figure 4, in terms of breed composition of the herds, 100% of herds in Kiang West comprise of N'dama Cattle only whilst in Niamina East 99.4% of herds comprise of N'dama cattle only, and the remaining 1.6% of the herds comprise of N'dama and mixed breed.

In Nianija, 92.1% of herds comprise of N'dama cattle only, 5.3% of herds comprise of N'dama and Zebu and the remaining 2.6% of herds comprise of N'dama and mix breed**.**

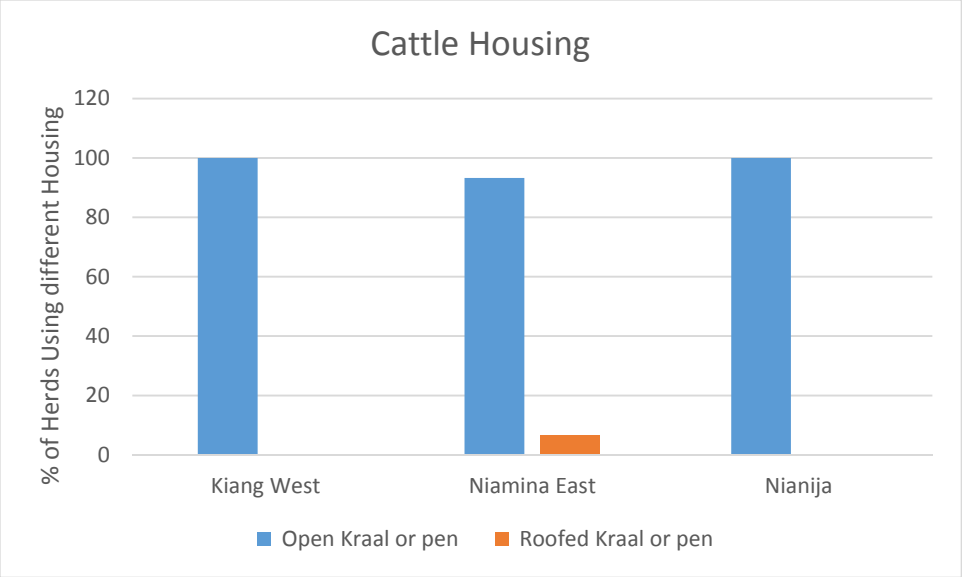
Figure 4: Herd composition at project sites



4.1.4 Housing for cattle

As shown in Fig 5 below, the overwhelming majority of cattle are housed in open kraals or pens both during the dry and rainy seasons. For both Kiang West and Nianija districts this was 100%. However in Niamina East, a limited number of herds (6.6%) use kraals or pens with roofs. In general, the findings on housing for cattle has shown that there has not been any progress when compared to the baseline survey findings in 2009. In that survey, a limited number of households (8%) use kraals or pens with roofs.

Figure 5: Cattle Housing



4.1.5 Housing for Small Ruminants

According to the findings of the qualitative survey as shown in Figure 6 below, the highest number of women respondents using a closed pen with raised platform to accommodate their small ruminants was in Nianija (40.9%), followed by Kiang West (34.8%) and Niamina East 29.2%. Closed pens with raised platforms are built with simple readily available materials. The findings indicate a high level of adoption of this technology which has been propagated by PROGEBE over the years.

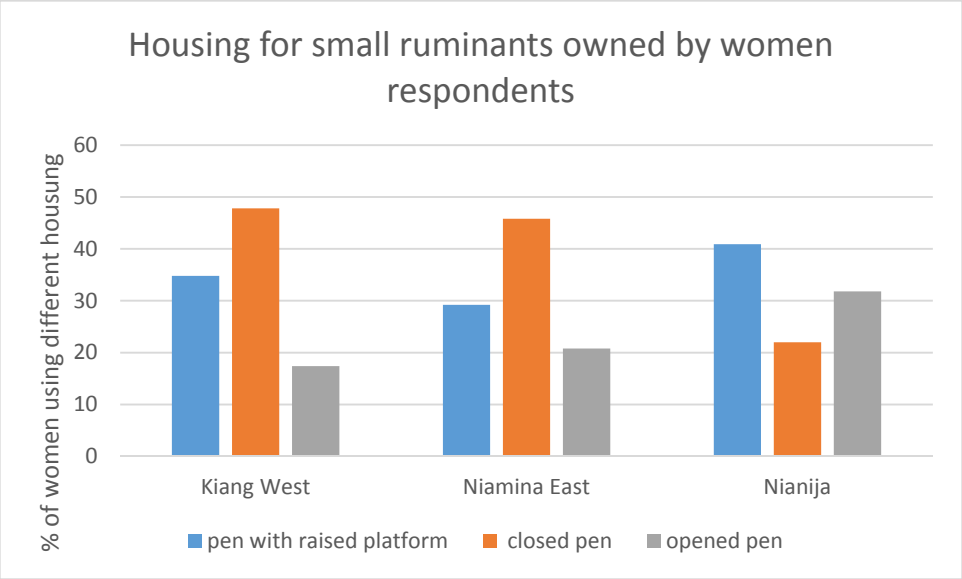
With regard to a closed pen without a raised platform the findings are as Follow: Nianija 22%, Kiang West 47.8% and Niamina East 45.8%.

For opened pen the findings are: 31.8% in Nianija, 20.8% in Niamina East and 17.4% in Kiang west.

75.9% of women respondents housed their small ruminants in closed pens either with or without raised platform and only 24.8% of respondents housed their small ruminants in open pens or kraals. This indicates some improvements when compared to the results of the PROGEBE-Gambia baseline survey 2009 which found that 67% of households use kraals or pens with roof or stable with roofs to accommodate their goats while 41.6% and 36.3 % of households use kraals or pens with roof or stable with roofs to accommodate their sheep in wet and dry season respectively.

PROGEBE has made tremendous strides in the training of farmers and extension workers to increase their knowledge and provide them with tools and skills on animal husbandry including improved feeding, health care and housing management strategies. The findings of this survey have clearly shown that in terms of adoption and application of technology and skills, women small ruminant farmers have responded well to the capacity building provided by the Project.

Figure 6: Small Ruminant Housing



4.1.6 FEEDING PRACTICES

Cattle

As shown in table 8 below, natural pastures constitute the main source of feeding of cattle in The Gambia. The findings indicate that in Kiang West where there is vast expanse of grazing resources with less pressure on the land, 96.4% of herds are grazed on natural pastures only whilst 3.6% graze on natural pastures and other feed resources.

In Niamina East where there is relatively more pressure on grazing resources due to bush fires and rice expansion, 71.7% graze on natural pastures only and the remaining 28.3% gazed on natural pastures and other feed resources.

In Nianija, 84.2% of herds graze on natural pastures only and the remaining 15.8% graze on natural pastures and other feed resources. There has been an expansion of settlements in the district and use of grazing lands for crop farms and rice expansion.

In view of the current rice expansion agenda premised on vision 2016 national self-sufficiency in rice production, ongoing capacity buildings initiatives geared towards building the capacity of livestock producers on feed conservation technology should be further enhanced for continuity after the closure of PROGEBE**.**

The other feed resources used by herders to supplement cattle feeding comprise mainly of groundnut hay, Fodder from trees, rice straw, cereal brans, Millet and Sorghum Stover.

Table 8: Percentage (%) of herds using different feed sources grazing

District	Natural pastures only	Natural pastures and other converse feed resources
Kiang West	96.4	3.6
Niamina East	71.7	28.3
Nianija	84.2	15.8

Small Ruminants

An average of 62.1% of all women respondent in the survey feed their small ruminants on natural pastures only whereas 37.9% feed their small ruminants on a combination of natural pastures and other feed resources. In Kiang West, 70% of women respondent feed their small ruminants on natural pastures only whilst the remaining 30% feed their small ruminants on a combination of natural pastures and other feed resources. For Niamina East the percentage is 43.5% on natural pastures only and 56.5% on natural pastures and other feed resources. For Nianija, feeding on natural pastures only comprise 72.7% whilst feeding on combination of natural pastures and other feed resources comprise 27.2%.

The findings also indicate that the other feed resources for small ruminants comprise mainly of groundnut hay as the leading feed supplement followed by rice and coose brans, fodder trees including panicum, household food remains, mineral licks, cereal grains, millet stover and salt which is usually added to the brans.

The review of project reports have indicated that besides the capacity buildings on feed conservation technology provided for small ruminant farmers, they have also been provided with panicum seeds for propagation.

Figure 9: % of women respondents feeding their Small Ruminant on natural pastures and other feed resources

District	Natural pastures only	Natural pastures and other converse feed resources
Kiang West	70	30
Niamina East	43.5	56.5
Nianija	72.7	27.2

4.1.7 Mating Practices

Cattle

With regard mating practices as indicated in table 10 below, 0% of herds in Kiang West practice strictly control mating, 35.7% in Niamina East and 57.9% in Nianija. As for loosely control mating, it is practiced by 51.7% of herds in in Kiang West, 56.3% of herds in Niamina East and 26.3% of herds in Nianija. Uncontrolled mating is practiced by 48.3% in Kiang West, 10.7% in Niamina East and 15.8% in Nianija.

In reference to the 2009 baseline survey, there has been tremendous progress made by cattle herders across all the 3 sites in terms of mating practices. This is evidenced by the fact that during the PROGEBE Gambia baseline survey it was reported that there were almost no controlled mating of cattle, sheep and goats in the project sites. Household that reported controlled mating were 2.1%, 0.8% and 0% for cattle, sheep and goats, respectively.

Table 10: % of herds practicing different mating practices

District	Strictly controlled	Loosely controlled	Uncontrolled
Kiang West	0	51.7	48.3
Niamina East	35.7	56.3	10.7
Nianija	57.9	26.3	15.8

Sheep

As indicated in table 11 below, small ruminant mating is mainly uncontrolled as evidenced by the findings indicating that uncontrolled mating is practiced by: 78.9% of our respondents in Kiang West, 69.6% in Niamina East and 77.3% in Nianija. With regards to loosely controlled mating, It is practiced by 21.1% of respondents in Kiang West, 17.4% in Niamina East and 22.7% of our respondents in Nianija. Strictly controlled breeding it is practiced by 0% of our respondent women small ruminant farmers in Kiang West and Nianija and by 13% of our respondents in Niamina East.

If compared with 2009 baseline survey report, some progress has been registered in the breeding practices in project sites. This could be attributable to the high adoption rate of technologies and skills by women farmers as already noted in Project sites.

Table 11: Small Ruminant breeding practice by % of respondent Women farmers

District	Strictly controlled	Loosely controlled	Uncontrolled
Kiang West	0	21.1	78.9
Niamina East	13.0	17.4	69.6
Nianija	0	22.7	77.3

4.1.8 Production constraints

The main constraints to livestock production were assessed during the herders' survey, with the herders asked to rank in order of priority, the 3 top constraints confronting cattle production in their respective districts. Results (inclusive of first second and third ranked constraints) are shown in Figure 7.

The following were the key production constraints in the project sites with some variation from district to district:

- Access to water for livestock
- Lack of feed during the dry season
- Livestock diseases and access to veterinary services
- Inadequate grazing land
- Mosquitoes
- Bush fires
- Stock routes
- Tsetse challenge

Livestock water is adequate during the rainy season. Natural depression in the tree and shrub Savanna minimize water intake. Long treks on more structured sources is minimized. Following the rainy season animals used swamps, river tributaries and river Gambia for water sources. However as the dry season progresses natural water sources start to deplete stockmen are forced to draw water from wells.

Except for slight variation at district level, in general, the results obtained in this survey are in line with the results of the PROGEBE-Gambia Baseline Survey 2009 which stated that the major technical constraints to livestock production as pointed out by PRA participants include water shortage, lack of feed and diseases.

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It is worth noting that in the PROGEBE-Gambia Baseline Survey, disease was the number one problem in Kiang West whereas in this survey disease came after water and feed. This could be attributed to the fact PROGEBE has strived to support communities for better access to animal health services with the promotion of preventive and curative animal health care measures. In most of Kiang West prior to the coming of PROGEBE animal health care was inaccessible. The Project facilitated the posting of Animal Health Technicians to remote parts of district where there were none before and has also provided them with motor bikes to enhance their mobility. In addition the Project in partnership with the Department of Livestock Services also supported the conduct of vaccination campaigns in the district against Transboundary Animal Diseases (TADs) such as CBPP. It is worth noting that there has been a resurgence of Contagious Bovine Pleuropneumonia (CBPP) in The Gambia which has been the main cause of mortality in cattle in some parts of the country, in particular in Central River and Upper River Regions. However CBPP has not been reported in the Kiang West. It therefore not surprising that the lowest mortality rate in cattle in all the 3 sites in this survey was registered in King West (6.9%) compared to the 10% in Nianija district where CBPP has re-emerged.

In Nianija, animal health was the top constraints reported by herders in this survey whereas water which was the top constraint reported in the 2009 PROGEBE-Gambia Baseline Survey came as third priority after animal health and feed. The possible explanation for this shift in priority could be attributed to the fact that there has been a resurgence of Contagious Bovine Pleuropneumonia (CBPP) after 41 years of absence of the disease in the country. The first outbreak of the disease was reported in November2012 in Niamina Dankunku in Central River Region. Nianija district was severely affected by the disease with lot of mortalities reported. In fact during this survey, it was found that the highest mortality in a single herd was reported in Nianija where 40 heads of cattle out of a herd of 80 heads died from reported CBPP. The mortalities did not happen during transhumance, This has reportedly happened after already returning home to Nianija from transhumance in Niamina Dankunku district in Central River Region South.

Furthermore, the provision of watering facilities at strategic locations by PROGEBE has also contributed in alleviating the acute water shortage in Nianija. These factors combined could have been responsible for the shift of priority number one from water to disease.

In Niamina East, animal health, mosquitoes and feed emerged as the 3 top constraints as reported by herders. The district has also been severely affected by CBPP though now under control. The problem of mosquitoes as a major animal health constraint in Niamina East is worthy of noting. In fact it will be mentioned elsewhere in this report that escaping from mosquitoes during specific periods of the year is considered by herders as one of the contributing factors to transhumance in the district.

In Niamina East, another factor worth noting is the Feed, Bush fire, Grazing land troika. These 3 constraints are very much interlinked as the underlining factors are highly interdependent. Bush fires and tight grazing lands are the major contributors to feed shortages in this district. The tight environment is due to expansion of crop cultivation especially rice fields to traditional grazing lands.

Figure7: Key Production Constraints ranking 1st in Percentage

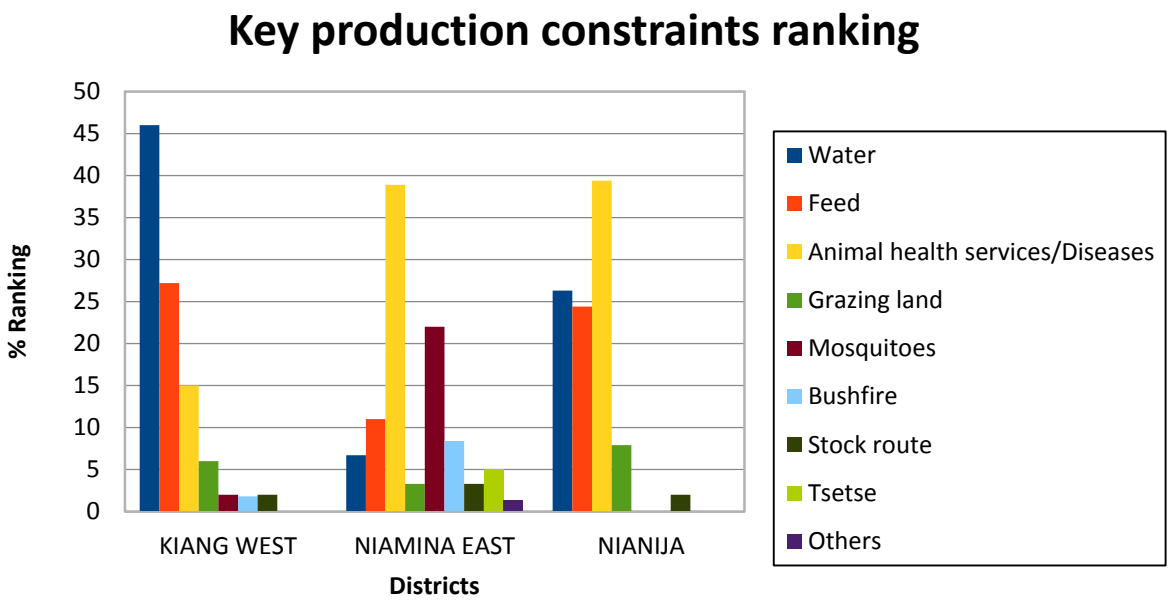


Figure8: Key Production Constraints ranking 2nd in Percentage

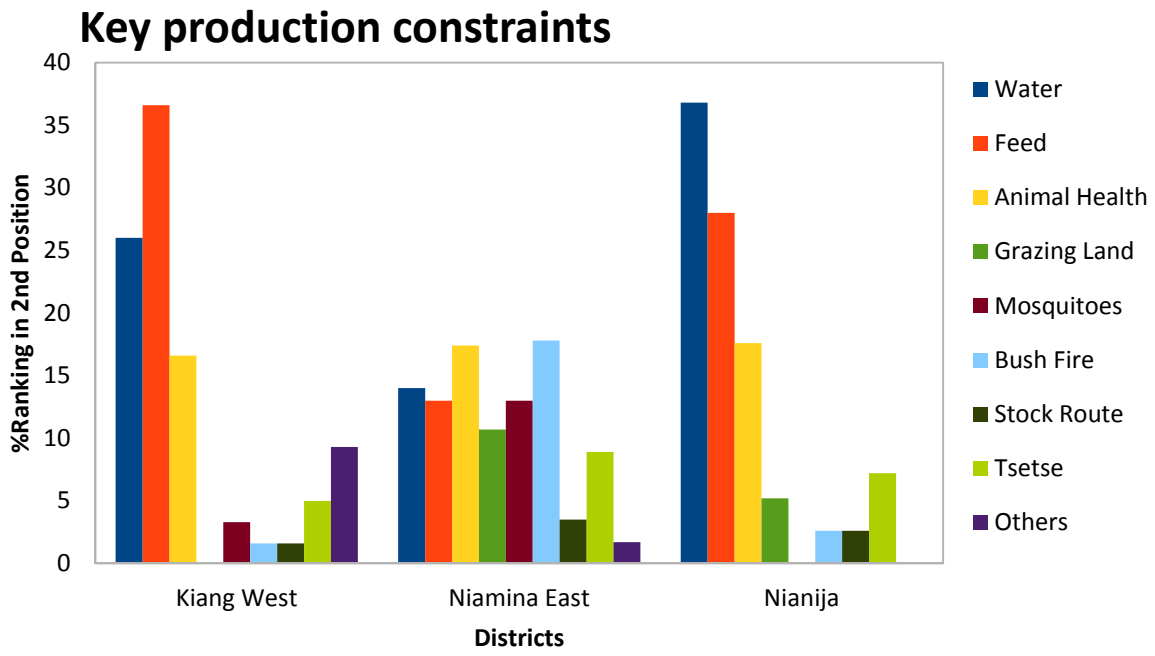
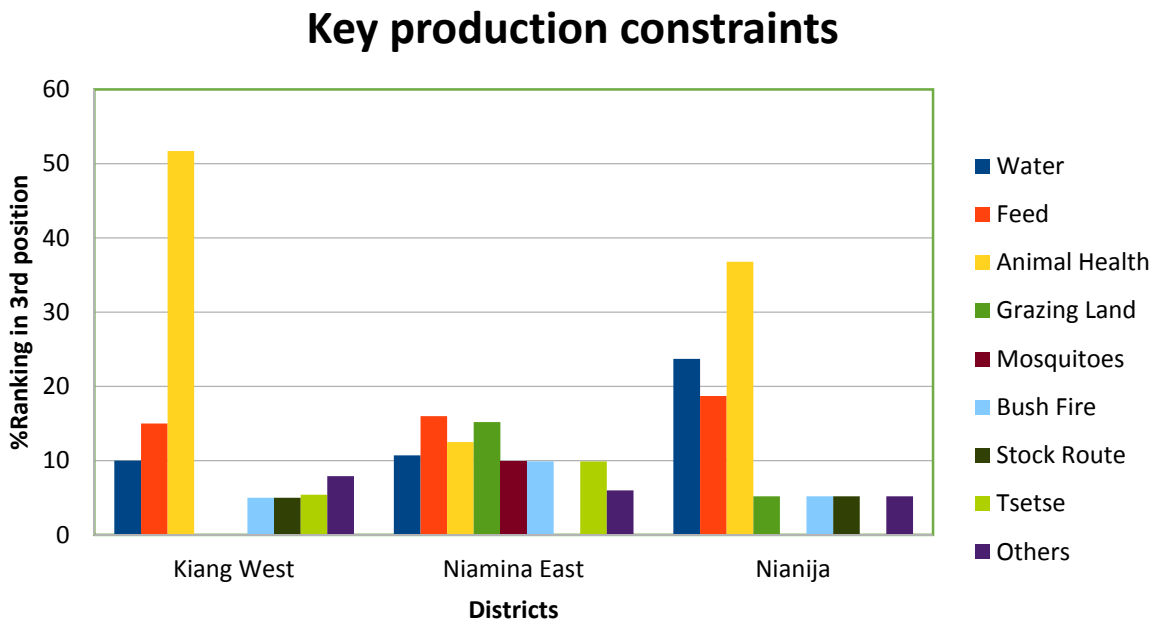


Figure9: Key Production Constraints ranking 3rd in Percentage



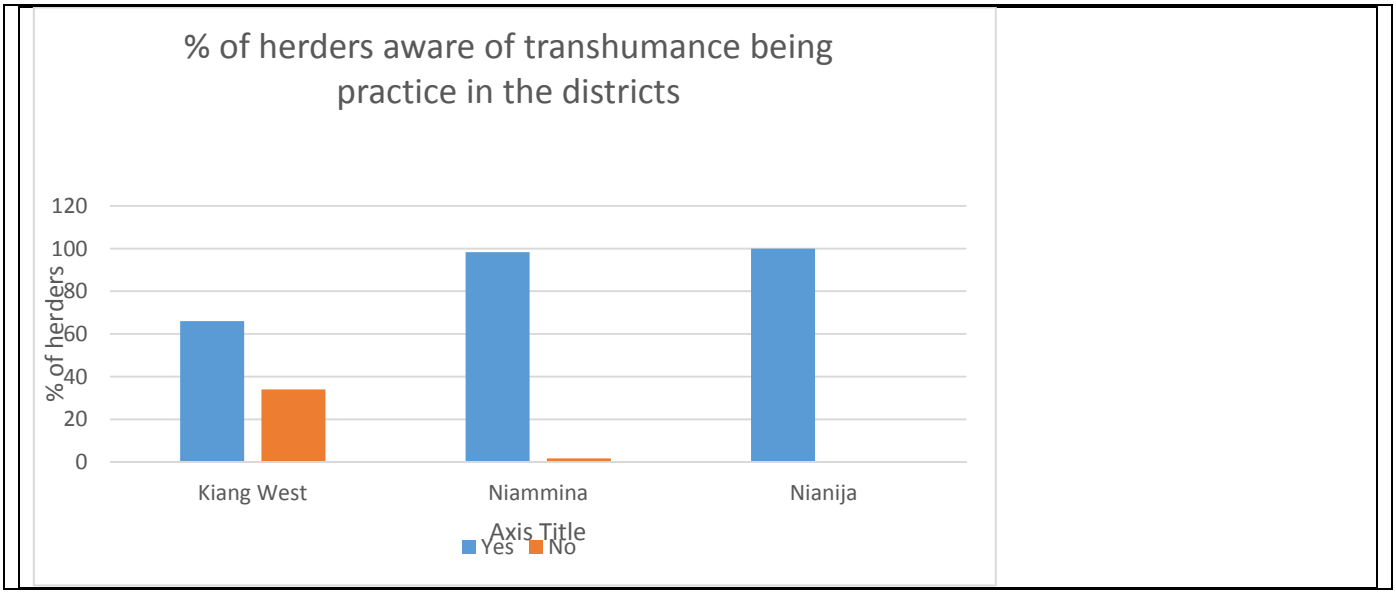
5. FINDINGS ON TRANSHUMANCE

5.1 Practice of Transhumance in Project Sites

5.1.1 Awareness on Transhumance being practiced

The survey results indicate a high level of awareness by herders and by the other relevant stakeholders on the practice of transhumance in all the 3 districts. In response to the question posed to herders as to whether they are aware of any form of transhumance being practiced in the district in the past 5 years, the findings were as follow: 100% of herders in Nianija were aware of transhumance being practiced in the district in the past 5 years whilst the percentage for Niamina East and Kiang West stands at 98.3% and 66% respectively as indicated in figure 10 below.

Figure: 10 Awareness of Herders on Transhumance being Practice



With regards to definition of transhumance as a possible pointer to farmers knowledge/perspective on the practice, it was not surprising to note that in response to the question posed to respondents on the definition of transhumance, 100% of herders in Niamina East and Nianija provided a sound definition for transhumance whilst the percentage that provided a definition was relatively lower in Kiang West at 65%. This could be linked to the widespread practice of transhumance in these two districts. The relatively low knowledge on transhumance in some parts of Kiang West could be attributed to the fact that there is no transhumance being practice in some parts of district.

The standard definition given by stakeholders hinges on the movement of herders with their animals from one destination to another for feed and water and then coming back. However, it was observed that in areas where transhumance is practiced widely on a large scale, the definition evolved to include other

elements such as the seasonality of the practice, availability of free grazing space/ environment for cattle and avoidance of biting insects (mosquitoes and tsetse flies).

5. 1.2 Involvement of Stakeholders

With regards to involvement of stakeholders in transhumance, the survey findings indicate a high level of variations in the involvement of the various stakeholders depending on the district in which they reside and on their respective roles. As indicated in Table 12, herders are the most involved stakeholders in transhumance. In Nianija 95% of herders were directly involved in transhumance by annually going on transhumance with their cattle. In Niamina East and Kiang West, the involvement of herders in transhumance was 48% and 16% respectively.

Table 12: % of involvement of Herders, Village Heads and Herd Owners in transhumance

	% of Herders		% of Village Heads		% of Herd Owners	
DISTRICTS	Yes	No	Yes	No	Yes	No
Kiang West	16	84	0	100	0	100
Niamina East	48	52	41.7	58.3	42	58
Nianija	95	5	45.5	54.5	43	57

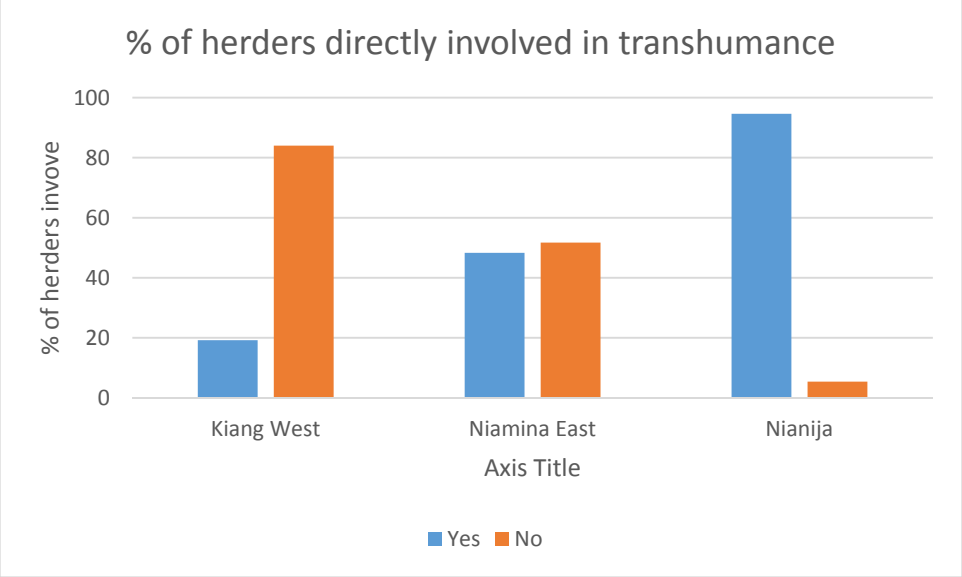
With regards to the involvement of herd owners, the qualitative survey findings are as Follow: 43% of the respondent herd owners in Nianija were involve in transhumance, 42% of respondents in Niamina East and 0% of the respondents in Kiang West. The findings reveal that the involvement of herd owners was mostly limited to either their individual past or present roles as transhumant herders or to their capacity as host for transhumance herders from within and outside the district including those from Senegal.

On involvement of traditional village heads (ALKALOLU) in transhumance, again Nianija takes the lead with 45.5%, followed by Niamina East with 41.7% and Kiang West with 0%. Apart from serving as host for transhumant herders, the role of village heads also cover overseeing the smooth handling of transhumance in their respective villages including the protection of the grazing resources as well as the resolution of conflicts between the herders and the crop farmers. The findings have also revealed that the village heads in some of the key destinations zones particularly in Nianija district are not involve in transhumance and that herders do not report to any local authority upon arrival. This type of situation needs to be properly address within existing local frameworks. Reporting to village heads provides an entrance opportunity for regulating the practice.

The survey also covered the 3 district Chiefs in the Project sites. In Nianija and Niamina East both district chiefs were highly involved in transhumance in various ways including arbitrating between the transhumant herders and their host at district tribunal level any conflict that cannot be resolved at village level, resolutions of any types of conflict that may arise as a result of the presence of large numbers of transhumant herders and their cattle, sensitization of arriving herds on the local conventions and facilitating the movement of herds during the rainy season to avoid destruction of crops by the migrating herds. In Kiang West the involvement of the chief was very limited as the transhumance in the district mainly limited to herders within the district. According to the findings of survey conducted with the

District Chiefs, their involvement could be greatly enhance if stock routes are demarcated for the cattle. They also mentioned provision of funds to enable them to use the mass media (community radios) for sensitisation of transhumant herders on the local conventions on the sustainable management of natural resources especially avoidance of bush fires and cutting down of trees. They lamented that some herders arrive in their districts without familiarising themselves with the relevant local conventions, the noncompliance to which at times leads to avoidable conflicts with local communities.

Table: 11 % of Involvement of Herders in Transhumance



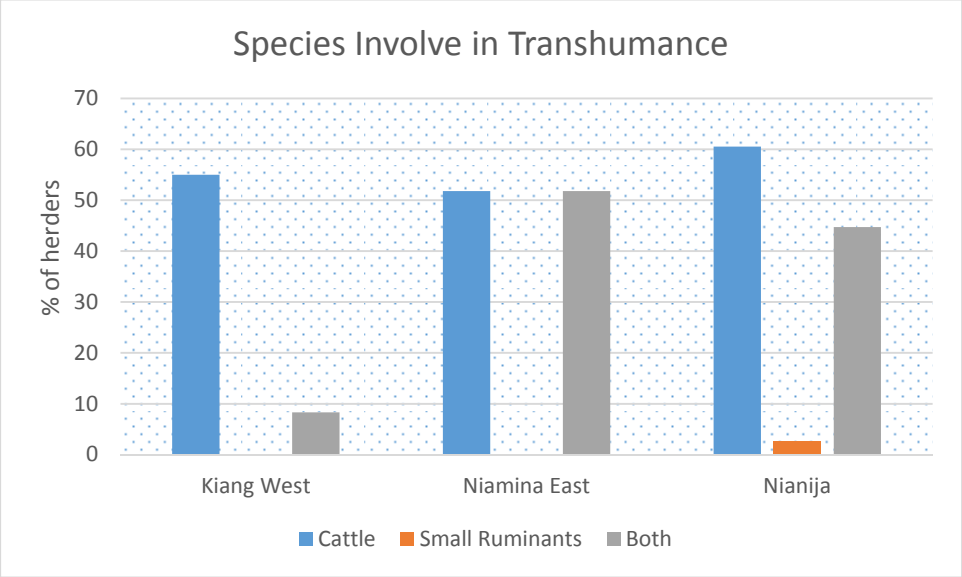
The District Animal Health Authorities were also covered by the survey. Their level of involvement was high in Nianija and Niamina East. It involves providing prophylactic vaccinations for transhumant herds prior to departure for transhumance as well as providing veterinary services including treatment and vaccination of arriving herds in the event they have not been vaccinated against Transboundary Animal Diseases (TADS) prior to arrival in the districts. It must however be noted that according to District Animal Health Authorities, their involvement could be enhanced by putting in place zoo sanitary regulations that will make it mandatory for all herds arriving in the districts to show prove of vaccination against TADs in particular CBPP, the control of which is priority for The Government of The Gambia.

As stakeholders on the sustainable utilisation of the natural resources, the Forestry Officers at District level were also targeted. The findings indicate that they were indirectly involve in transhumance especially in the prevention and control of bush fires which annually ravages the pastures during the dry season.

5.2 Species Involve in Transhumance

Herders were requested to pick out the species involve in transhumance in their districts from a list of 3 choices: A). Cattle B). Small Ruminants and C). Both Species. The results of the survey indicate that cattle was the species mostly involved in all the 3 sites, although small ruminants were also involved. As indicated in figure 11 below, 55% of herders in Kiang West selected cattle as the species involve whilst 8.3% selected both species (cattle and small ruminants) which is an indication of some level albeit low level of small ruminant involvement notwithstanding the fact that 0% selected small ruminants as the species involved. In Niamina East there was a split with 51.8% mentioning cattle and 51.8% mentioning both species with 0% selecting small ruminants. It's worth noting that in Nianija besides the 60.5% that selected cattle, and 44.7% that selected both species, there was also 2.6% of herders that selected small ruminants. It must be highlighted at this juncture that in making their selections, the respondents were not limited to a single choice.

Figure 11: Species Involve in transhumance



5.3 REASONS FOR TRANSHUMANCE

As indicated in Figure 12 below, the main reasons why herders go on transhumance is lack of both feed and water as cited by 100% of herders from both Niamina East and Nianija where transhumance is widely practiced on a large scale. In the case of Kiang West where either low level or no transhumance is practiced, herders also cited the same reason (58.3%).

It is worth noting that during the long dry season extending for 8 months from October to June, grasses dry up and are often consume by widespread uncontrolled bush fires. In addition, water ponds also dry up thus resulting in herders moving with their animals as a resilience strategy. In the Gambia transhumance is a well-known practice that has for years been an integral part of the traditional

livestock production system as a cooping strategy to deal with shortages of feed, water, and grazing land as well avoidance of pest and diseases. During the 2010 household survey conducted by PROGEBE Gambia it was found that among other strategies such as collection and storage of bush hay and collection of tree fodder, transhumance ranked as the most common strategy adopted by households to anticipate feed shortages. The household survey further revealed that for households owning animals, their priority coping strategy in the face of acute feed shortage were: transhumance (52.3%), priority feeding of certain categories of animals (29.5%) and sale of animals (18.2%) as indicated in table 13 below:

Table 13: Commonly used strategies to prevent feed shortages

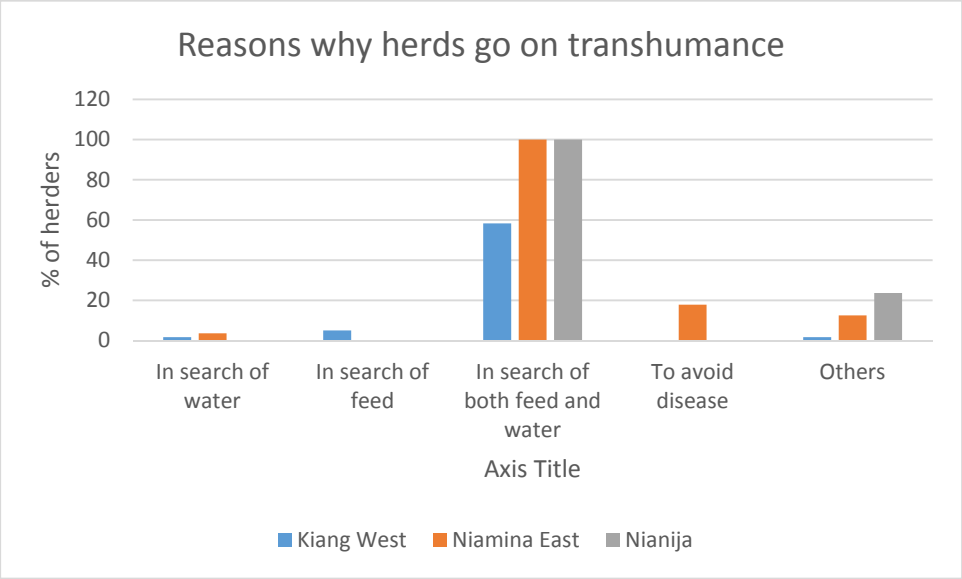
Strategy	**Percentage ranking 1st**	**Percentage ranking 2nd**
Transhumance	35	5
Reduce herd/flock size through sales	2	6
Collect and store bush hay	24	9
Collect fodder tree	14	26
Purchase feed supplement	7	9
Store more crop residues	49	26
Plant fodder crops	-	3

Source: PROGEBE-Gambia household survey (2010)

The results also indicate that in Niamina East in addition to feed and water during the dry season, a significant 17.9% of herders also cited avoiding mosquitoes during the rainy season as a reason for transhumance.

The other reasons cited by (27.9%) in Nianija, 12.5% in Niamina East and 1.6% in Kiang West in mainly due to the constricted environment for their cattle during the rainy season when there is competition for space between crop farmers and herders. The herders may resort to transhumance as a coping strategy to avoid damages of crop fields which can result to heavy fines being imposed on the herd owners depending on the extent of the crop damage.

Figure 12 Reason for transhumance



5.4 Types of Transhumance Involve

Herders were questioned about the types of transhumance in their districts. The finding as shown in Figure 13 reveal that different type of transhumance are involve in the Project sites with some variations from district to district and also within districts.

Niamina East

In Niamina East, it is mainly transhumance involving herders from outside the districts mainly from other regions of the country. As mentioned by 96.4% of herders, the transhumance in the Niamina East involves herds coming from other districts/regions within the country, a significant 50% of herders also mentioned that the transhumance in the district involves herders from neighbouring Cassamance Province of Senegal. There is a two way transhumance traffic between the district and Cassamance with herds from the district travelling to Cassamance during the rainy season and herds from Cassamance coming to the district during the dry season. There is also some significant volume of transhumance involving herds within the district as mentioned by 51.8% of herders (Cumulative options A, B and C i.e. herders from your village 30.4%, herders from neighbouring villages 1.8%, herders from remote villages that are part of the district 19.6%)

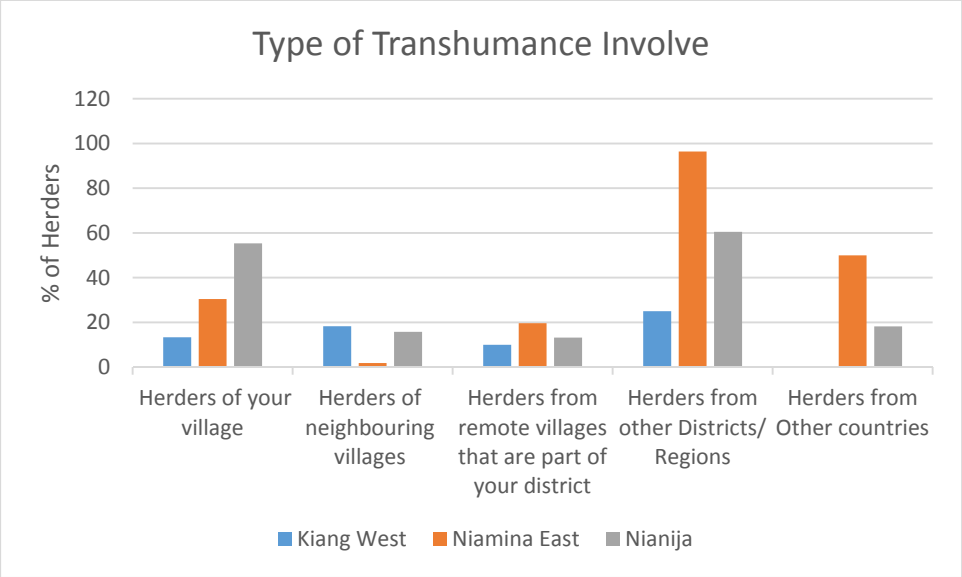
Nianija

In Nianija, the main types of transhumance practiced according to herders in the district are as follow: transhumance involving herders within the district as mentioned by 84.3% (Cumulative options A, B and C i.e. Herders from you village 55.3%, Herders from neighbouring villages 15.8%, Herders from remote villages that are part of the district 13.2%); transhumance involving herders from outside the region i.e. herders from other districts/ regions (60.5%); as well as transhumance involving herders from Senegal 18.2%.

Kiang West

In Kiang West the main type of transhumance in the district involves herd within the district as mentioned by 51.8% (Cumulative options A, B and C i.e. herders from you village 13.3%, herders from neighbouring villages 18.3%, herders from remote villages that are part of the district 10%). There is also some transhumance involving herds from other districts/regions within the country 25%. There is however no transhumance from outside the country into Kiang West.

Figure 13: Type of transhumance involve



5.5 Level of transhumance made within the district by herders based in the district

In all the 3 districts there is transhumance being practiced by resident herders within the district, though the level varies from one district to the other.

With regards to high level internal transhumance (practiced widely on a large scale), Figure 14 shows it is widely practiced on a large scale in Nianija and Niamina East. However in Kiang West high level internal transhumance is not practiced. The highest level of internal transhumance is practiced in Nianija district

as evidenced by the selection of this option by 92.1% of herders, in Niamina East it is 51.8% and in Kiang West where it is not practiced widely on a large scale it stands at 0%.

With regards to medium level internal transhumance, a scenario where transhumance is practiced but not widely within the district by resident herders, the finding of the survey are as follow: 17.9% in Niamina East, 10% in Kiang West and 5.3% in Nianija.

With regards to Low level internal transhumance, a scenario where transhumance within the districts by resident herders is rarely practiced, the findings are as follow: 60% in Kiang West, Niamina East 23.2% and Nianija 2.6%.

With regards to no transhumance this was totally absent in Nianija, 8.9% Niamina East and 30% in Kiang West.

District Summary

Nianija

In Nianija transhumance within the district by resident herders is generally practiced widely on a large scale (92.1%).

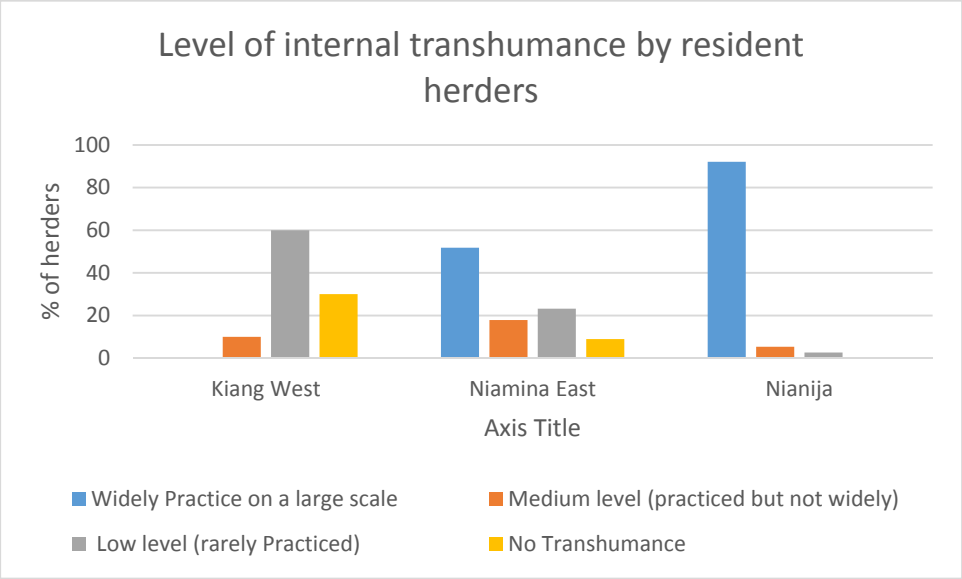
Niamina East

In Niamina East the practice of transhumance within the district by resident herders is more varied depending on which part of the district the herders reside. In general, it is predominantly on a large scale in most of the district though there is a small pocket in the district where resident herders are not involved in internal transhumance.

Kiang West

Kiang West there is generally a low level of transhumance being practiced in parts of the district though there is no transhumance practiced in some parts of the district.

Figure 14 Level of internal Transhumance by resident herders



5.6 Level of transhumance made within the districts by non-resident herders

The level of transhumance made within the 3 districts by non-resident herders varies greatly from district to district.

Kiang West

In Kiang West, the level of transhumance practiced by non-resident herds is either low in parts of the districts as stated by 53.3% of herders or not practiced at all (0%) in some parts of the district. The reasons for the low level of practice or non-practice of transhumance in Kiang West is attributable to a number of factors among which include the fact that most of Kiang West is not easily accessible to herders from outside the district due to its location and huge distance from the major sources of transhumant herds, secondly in the districts neighbouring Kiang West, and in the adjacent areas of neighbouring Cassamance province of Southern Senegal, there is no acute shortage of feed, thirdly water is a major challenge to livestock production as evidenced by the fact that in this survey water was ranked as the most important constraint to livestock production in the district.

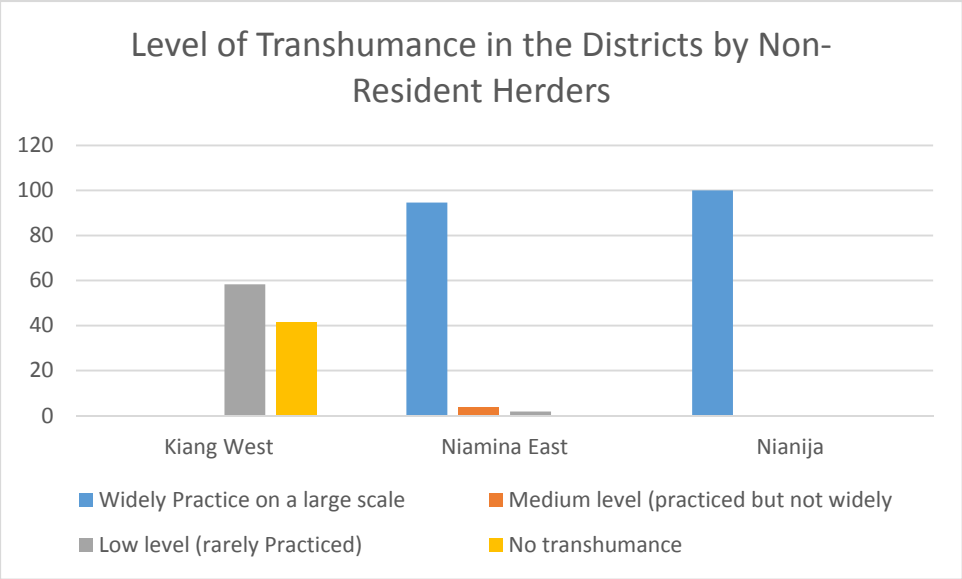
Niamina East

In Niamina East transhumance into the district is widely practiced on a large scale by non-resident herds as evidenced by the score of 94.6% by the herders in the survey. However despite high level of practice, there are small pockets in the districts with either medium scale (3.6%) or level transhumance (1.8%). Niamina East is frequented by herders from Upper River Region and also from Senegal. The relatively abundant dry season pastures in the lowland areas at the riverside and the availability of water for livestock during the dry season are worth mentioning.

Nianija

Nianija has the highest level of transhumance into the district being practice by non-resident herders. 100% of herders considered Nianija as a district where transhumance by non-resident herders is practiced widely on a large scale. The abundant pastures available at the well-known dry season grazing areas i.e. islands and rice fields of Nianija are worth noting.

Figure 15: Level of Transhumance by non-resident herders



5.7 Role of the districts in transhumance

All the 3 districts play some role in transhumance though the role varies widely between districts and also within the districts as indicated in Figure 17 below. Kindly note that due to the possibility of multiple roles, respondents were not limited to making a single choice.

Kiang West

Kiang West mainly serves as recipient/host zone for transhumance herds (46.7%). The main recipient areas in the district include Dumbuto, Brikamanding, Kuli Kunda, Bajana, Jamaru, Jali, Kemoto, Kantong Kunda among others. The transhumant herders are from mainly within the district.

In some parts of the Kiang West in particular in the Niorro Jattaba area with high cattle population and proximity to the main Jarra Soma high way, herders go on transhumance to both within and outside the district as evidence by 21.7%. The main destination zone outside the district is neighbouring Kiang East.

In the remote interior of Kiang West, the response from most herders is that the district does not play any role in transhumance thus the 31.7% no transhumance practiced. These areas include settlements such as Keneba, Wudeba, Dumboto, Jifarong, Joli, Burong and Karantaba among others.

Niamina East

The role of Niamina East in transhumance is varied. The district serves principally serves as both host and source (85.7%). It also serves as recipient/ host (16.1%), as well as source, host and transit 14.3%.

The following areas serve as both host and source Kerewan Demba, Sinchu Janko, Kerr Omar Dahe, Mawdeh Kunda, Misera, Pateh Sam, Bamba Kolong, Welingara among others. There are areas in the district that serve principally as only host. These include but not limited to Kerewan Touray, Sotokoi, Macca, Jallow Kunda and Njie Kunda among others.

Niamina East, located in the southern part of Central River Region is characterised by woodlands interspersed with open savannah and fresh water swamps which makes it a favourable destinations for transhumant herders from mainly Upper River Region and from Cassamance, Senegal. The district also serves as transit zone for these herds on their way to the lowland fresh water grazing pastures of Niamina Dankunku District, a very important recipient zone for transhumant herds.

Nianija

The district of Nianija plays multiple roles in transhumance, it serves as both host and source (65%), recipient (40%), source and transit 13.2%. It also serves as source only (2.6%) and transit (2.6%)

The lowland tidal fresh water plains interspersed with small islands with good pasture during the dry season makes this district a favourable destination zone for herds from other parts of the country mainly from Central and Upper River Regions as well as from Northern and Southern Senegal. Nianija is also a major source of transhumance during the rainy season due to expansion of settlements, crop and rice cultivation. The major destination zones are in Upper Saloum as shown in transhumance map below. Other destinations are mainly in Niani district all in central River Region.

Figure 16: Transhumance map of Nianija

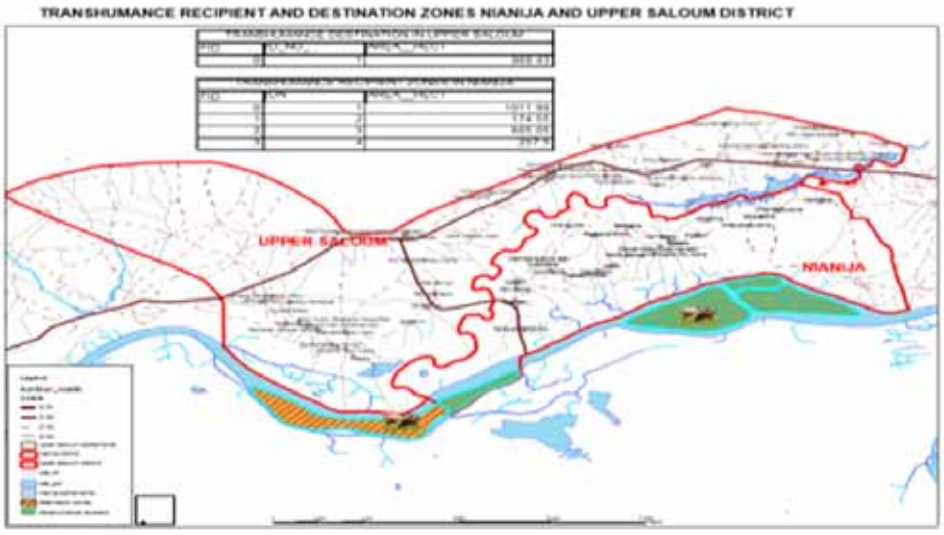
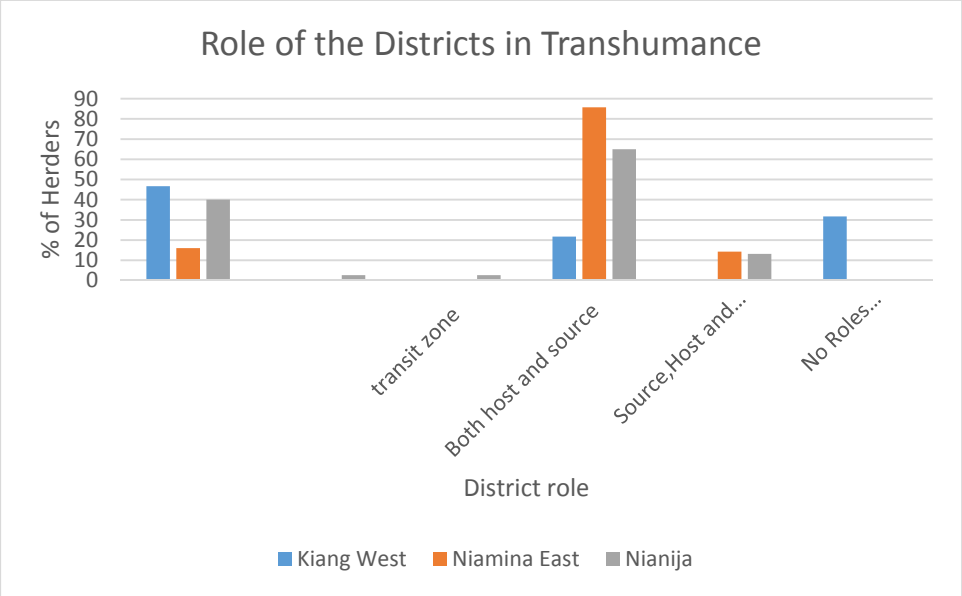


Figure 17: Role of the districts in transhumance



5.8 Seasons of departure for resident herders

The results of the survey strongly indicate that transhumance is highly organised in the Gambia and that there is a definite seasonal pattern in the arrival and departure of transhumance herds with slight variations from district to district also within districts depending on the prevailing agro-pastoral/agro-ecological conditions at source and destination zones.

Based on the departure period and the duration of stay, It is possible to identify two main types of transhumance practiced namely rainy season and dry season transhumance.

Just Before the Onset of the Rainy Season

For rainy season transhumance, resident herds depart just before the onset of the rainy season. This period is the most common departure period in Nianija and Niamina East cited by 84.2% and 46.4% respectively. Rainy season transhumance in these two districts is usually associated with restricted environment for cattle due to competition of space between herders and crop farmers. The departure is appropriately scheduled to avoid damages to crops as cattle tracks are generally inadequate to prevent crop damages. In the case of Niamina East avoidance of mosquitoes is also factored into the departure period.

END OF THE RAINY SEASON OR EARLY DRY SEAON

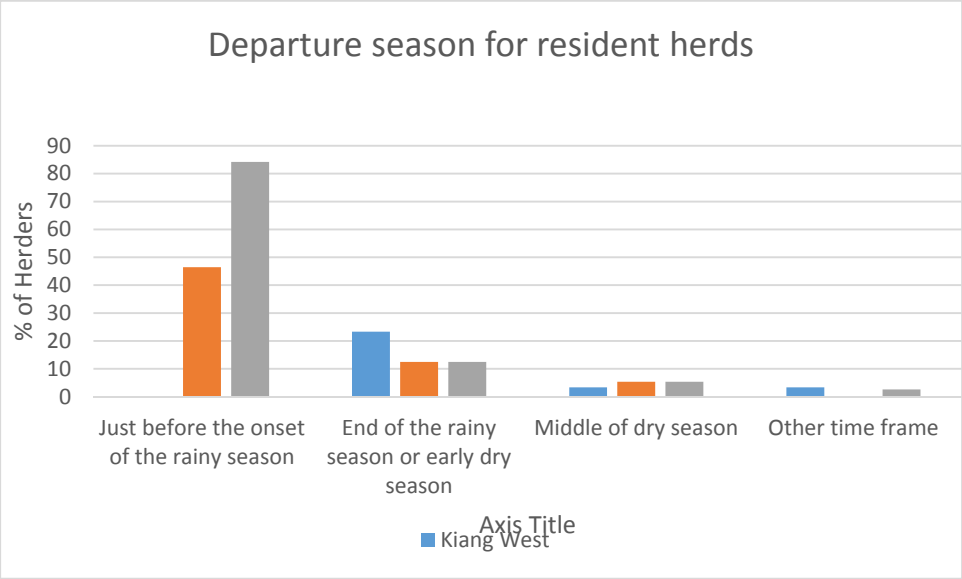
This is the usual departure time frame for dry season transhumance. It is seen in all the three districts as cited by percentage of herders as follow: 23.3% in Kiang West, 12.5% in both Niamina East and Nianija. It is accordingly scheduled so that the animals can move into rice fields and flood plains when the rice crop is harvested. Rice straw, abundant pastures and fresh water are available in the fields.

MIDDLE DRY SEASON

Middle dry season departure period for resident transhumance herds is mainly attributable to combination of factors associated with the depletion of pastures and the inadequate water supply as the dry season advances. Ravaging bush fires that usually occur exacerbate the feed shortages. Middle dry season departure was cited by 5.4% in both Niamina East and Nianija. In Kiang West it was cited by 3.3% of herders.

The other time frame include late dry season represented by 3.3% and 2.6% of herders in Nianija and Kiang West respectfully.

igure 18: Departure season for resident herds



ARRIVAL SEASON FOR TRANSHUMANT HERDS AND FLOCKS

END OF THE RAINY SEASON OR EARLY DRY SEASON

As seen in Figure 19 below, the end of the rainy season or early dry season accounts for most of the arrival transhumance herds into all 3 districts. This is cited by 96.4% of herders in Niamina East, 55.2% in Nianija and 11.7% in Kiang West.

JUST BEFORE THE ONSET OF THE RAINY SEASON

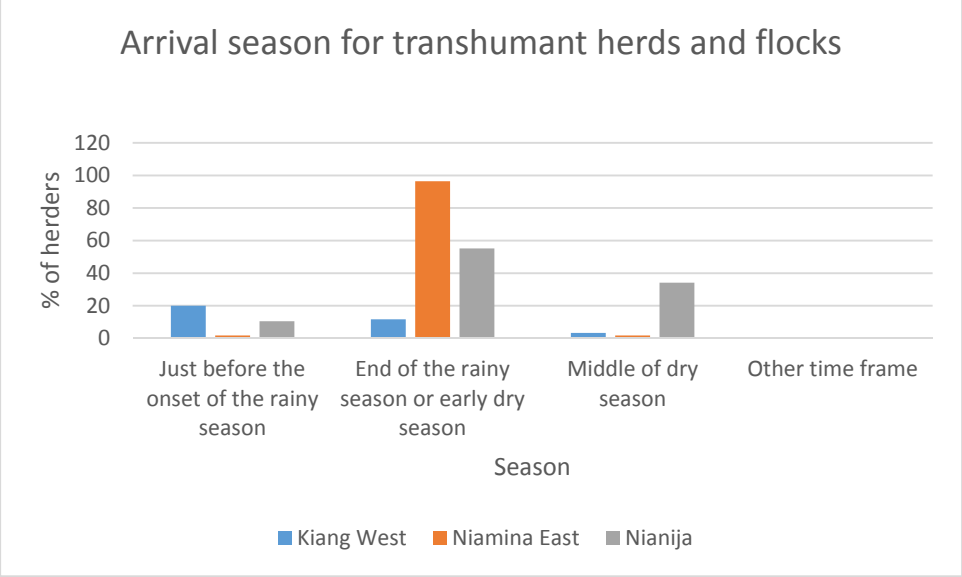
This was mentioned by 20% in Kiang West, 10.5%% in Nianija and 1.8% in Niamina East.

Middle Dry Season

There is also some arrivals during the middle dry season as cited by 34.2% in Nianija, 3.2% in Kiang West and 1.8% in Niamina East. The relatively high percentage of 34.8% seen in Nianija could be linked to the fact that the district has a well organised system regarding access to grazing fields at swamps and rice fields. Herds are only allowed entry into these areas after 15th of March when rice harvesting is fully

completed and the produce is transported from the field to avoid damage by arriving cattle. However prior to getting access to the rice fields, arriving herds are required to be based on already harvested groundnut, maize and millet fields to manure the fields.

Figure 19: Arrival season for Transhumant herders.



5.9 Seasons of departure of non-resident transhumant herds

The departure period of non-resident transhumant herds falls predominantly with the period just before the onset of the rains as cited by 86.8% in Nianija, 67.9% in Niamina East and 13.3% in Kiang West as shown in figure X below. This could be explained by the fact that the principal reason of these herds coming for transhumance in the first place is due to inadequate feed and water at their source during the dry season. As feed and water become available in their places of origin, the herds return in time just before the onset of the rainy seasons thereby also reducing the possibility of conflict with their host as cultivation commences**.** The inadequacy of stock routes to facilitate the movement of the herds is also factored in as this could serve as a potential source of conflict due to possible crop damages when herds return late.

End of Rainy Season or Early Dry Season

This is the departure period for herd that usually arrive for rainy season transhumance. They return to their sources at the end of the rainy season to access the flood plains and rice fields with abundant pastures, crop residues and fresh water for livestock**.** This departure season was cited by 30.8% of herders in Niamina East, 7.9% in Nianija and 8.3% in Kiang West

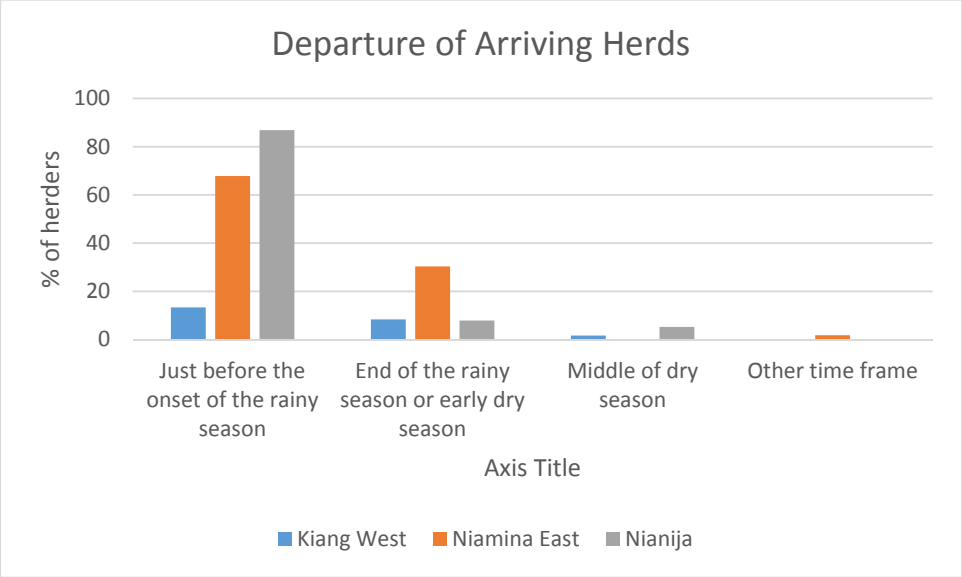
Middle Dry Season

There is also some departure of non-resident herds at this period as cited by 5.2% of herders in Nianija, 0% in Niamina East and 1.6% in Kiang West.

Other timeframes

This departure season was registered in only Niamina East by 1.7% of herders. It reflects late dry season departures.

Figure 20: Departure of Arriving Herds



5.10 Groups Excluded from Transhumance

According to 40% of all herders involved in the survey, sick animals, lame ones, draft animals and young ones/newly born calves are the groups that are left behind. The main factor advanced by the herders in deciding which animals to exclude from the herd is the health condition of the animals and the distance to the final destination.

Animals that are either sick or in poor conditions are deliberately left behind for fear that they might not be able to take the hardship involve in trekking to the final destination. The objective is to avoid mortality.

Oxen are also left behind because they would be needed in the farms for cultivation. It is proper to highlight that most herd owners are also subsistence crop farmers. Low input sustainable agriculture involving both crop and livestock production basis of their livelihood.

2% of herders in the survey stated that high milk producing cows are at times left behind to provide milk for the family during the period that the herds are away on transhumance. This is important as milk serves as both food and source of income for the families left behind.

5.11 Measures taken to protect the herd prior to departure for transhumance

Significant percentage of herders across the 3 districts prior to departure on transhumance take specific measures to protect their cattle. The results indicate that measures are taken by 86.2% of transhumant herders in Niamina East, 46.2% in Nianija and 12.5% in Kiang West.

Vaccination against endemic diseases is the only measure that is taken by all the herders who take measures. The vaccinations are usually against Haemorrhagic Septicaemia (HS) and Black Quarter disease (BQ). Both diseases have thermo stable vaccines that are readily available when needed.

HS and BQ are the major infectious diseases in cattle in The Gambia. The high level of prophylactic vaccination against HS in Niamina East and Nianija could be attributed to the fact Central River Region has the highest incidences of Haemorrhagic septicaemia in the country. Furthermore, it is important to note that there exist a seasonal pattern in the occurrence of the disease. The disease occurs throughout the year with highest incidences at the onset of and peak of the rainy season June and August respectively (Daffeh 2002). The onset of the rainy season is also the departure period for resident herds going on transhumance.

Some herders also deworm their cattle prior to departure. Traditional means are also used to protect their herds. This involves giving a concoction of herbs and salts which is believed to prevent diseases.

5.12 Disease outbreaks and mortalities encountered during transhumance

As shown in table 14 below, the findings of the survey reveal that in the past 5 years, disease outbreaks and mortalities during transhumance i.e. either on transit or at final destinations have been encountered in all the 3 districts.

The highest occurrences of disease outbreaks encountered during transhumance was In Niamina East where 27.6% of herders involved in transhumance have encountered disease outbreaks in their herds either in transit or at final destination. In Nianija 25% of herders involved encountered disease outbreaks and 11.1% in Kiang West.

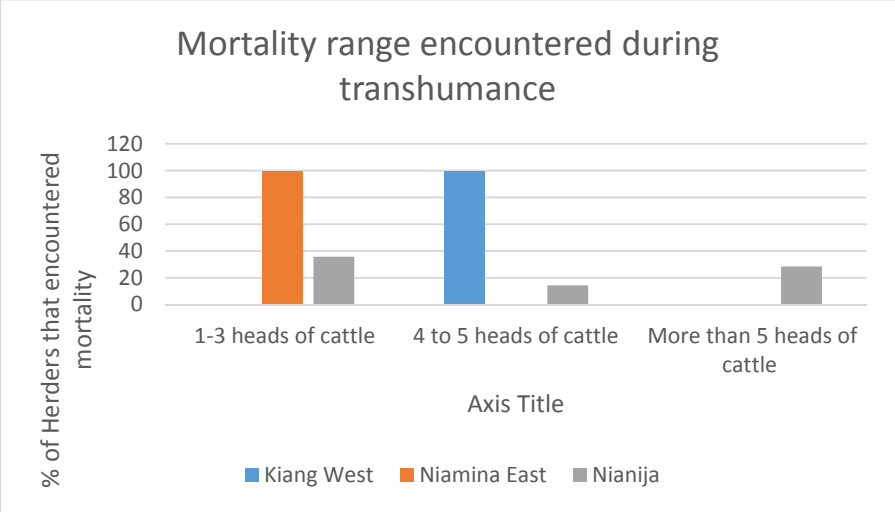
In Niamina East mortality during transhumance in the past 5 years was encountered by 24.1% of herders involved in transhumance, followed by Nianija where 19.6% of herders involved in transhumance encountered mortalities in the past 5 years. In Kiang West mortalities during transhumance was encountered by 11.1% of herders involved.

Table 14: Frequency of Disease outbreaks and Mortalities encountered during transhumance

District	% of transhumant herders who encountered Disease Outbreaks in the last 5 years	% of transhumant herders who encountered mortality in their herds in the last 5 years
Kiang West	11.1	11.1
Niamina East	27.6	24.1
Nianija	25	19.6

Figure 21 below shows the mortality range encountered during transhumance in the past 5 years. In Kiang West and Niamina East, the mortality range is between 1 to 3 heads of cattle in the herds that registered mortality. In Nianija it varies. In the 35.7% of the herds that encountered mortality during transhumance the range was 1 to 3 heads of cattle, in 14.3% of herders that encountered mortality it ranged from 4 to 5 heads of cattle and in the remaining 28.4%, the mortality was more than 5 heads of cattle.

Figure 21 Mortality Range during transhumance



5.13 Diseases encountered during transhumance

The results indicate that depending on the district, a number of infectious disease are of major concern to relevant stakeholders involve in transhumance. The diseases are Foot and Mouth Disease (FMD), Lumpy Skin Disease (LSD), Black Quarter Disease (BQ), Haemorrhagic Septicaemia (HS), Contagious Bovine Pleuropneumonia (CBPP) and Anthrax.

In Kiang West according to herders and other stakeholders involve in the survey, the priority the diseases of concern in transhumance are: Anthrax, Black Quarter, Foot and Mouth and Lumpy Skin Disease.

In Niamina East and Nianija the disease are: Haemorrhagic Septicaemia, Lumpy Skin Disease, Contagious Bovine Pleuropneumonia, Foot and Mouth Disease and Black Quarter Disease.

These diseases are repeatedly encountered by the transhumance herders. The herd owners and District Animal Health Authorities have shown concern with the introduction of Contagious Bovine Pleuropneumona, Lumpy Skin and Foot and Mouth Disease.

After 41 years of absence in the country Contagious Bovine Pleuropneumonia (CBPP) has re-emerged in 2012. Prior to the 2012 outbreak, the last reported case of CBPP in the Gambia was in 1971 and vaccination ceased in 1987.The disease was first reported to the Department of Livestock Services on 3rd August 2012 following an outbreak in Niamina Dankunku in Central River Region, a major destination zone for transhumance herds from the rest of the country as well as for transhumant herd from Cassamance. Following the aftermath of the outbreak in 2012, emergency measures were taken to prevent the spread of the disease. Among the measures that were taken include the imposition of a 6-month temporal ban on transhumance to and from affected districts as well as a nationwide mass vaccination campaign of the entire cattle population above six months of age. These initial measures proved quite effective in halting the spread of the disease with worst case scenario averted. However the disease still remain a major threat to cattle production in the country. In subsequent years, PROGEBE has supported the Department of Livestock Services in the conduct vaccination campaigns against CBPP in project sites.

With regards to small ruminants, the findings of the qualitative stakeholders' survey have revealed that the disease of concern to the relevant stakeholders particularly to the womenfolk in all the 3 districts is Peste des Petit Ruminants (PPR). Besides PPR, the other disease of concern is Pasteurellosis in small ruminants in Niamina East and Nianija.

Peste des Petit Ruminants (PPR) is the major killer infectious (Viral) disease in the small ruminant population in The Gambia with estimated mortalities at 11.9 - 20.3% (AHPS). The disease is present throughout the country with Central River Region CRR (North and South), North Bank Region (NBR) and Upper River region (URR) being particularly more vulnerable. Niani, Nianija and Niamina East districts all in CRR are major destination zones for migrant sheep and goats from other districts of The Gambia as well as Northern Senegal in search of pastures during the late dry season. The concentration of these large flocks of small ruminants during this period poses a risk factor for the spread of PPR and other trans-boundary animal diseases in small ruminants. Furthermore, The Gambia has porous borders with Senegal with most movements of small ruminants from Senegal to Gambia occurring in both north and south borders of The Gambia.

PROGEBE Gambia since its inception has been providing logistic support to the Department of Livestock Services in the conduct of vaccination campaigns at project sites in the effective prevention and progressive control of PPR.

5.14 Transhumance routes

There are stock routes available in all the 3 districts though inadequate. In Niamina East and Nianija where transhumance is practice widely on a large scale, herders use to share fixed transhumance routes. In response to the survey question on the use of shared fix routes with other transhumant herders the findings are as follow: 12.5% in Kiang West, 89.7% in Niamina East and 94.7% in Nianija**.**

Niamina East

In Niamina East wherever stock routes are available, they are the route of choice for transhumant herders especially for those herds that migrate during the onset of the rainy season when cultivation is in progress. It was highlighted during the interview by the District Chief that some stock routes need re-demarcation as they have disappeared as a result of the expansion in crop farming leading to encroachment into the areas where the tracks previously existed. There is high usage of stock routes in the district. According to The District Head Chief at times he facilitates emergency passage through cultivated fields and inform all concerned stakeholders thus avoiding damage to crops.

Besides stock routes, significant percentage of herders in the district use the main Banjul Basse Highway when in transhumance to the neighbouring district of Niamina Dankunku.

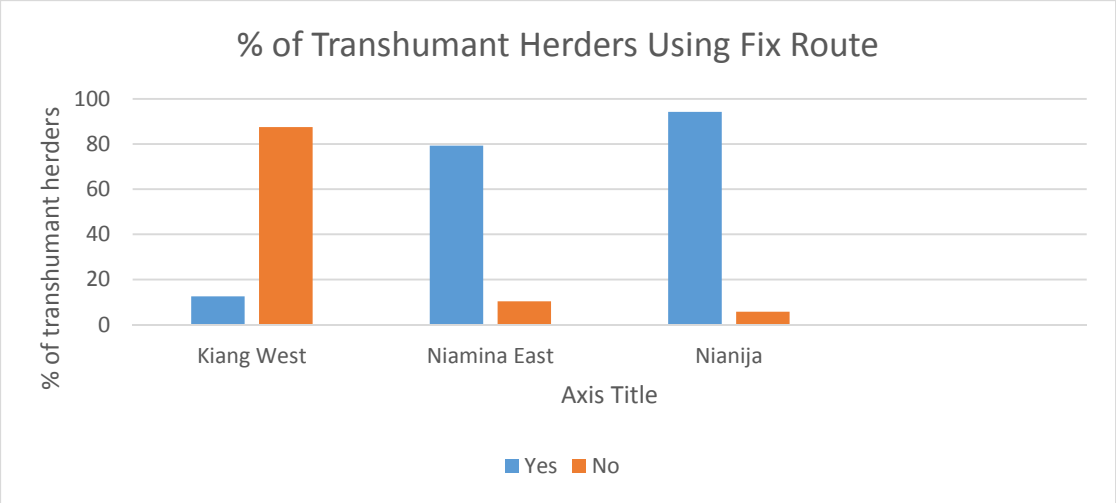
Nianija

Stock routes are the preferred routes of choice in view of the expansion of settlements, farmland habitat conversion. The main road (Highway) is frequently used by herders especially those going to Upper Saloum and Niani districts. Demarcation of stock routes to enhance access to grazing fields was an issue raised by the stakeholders in Nianija during the stakeholders.

Kiang West

In Kiang West there is low level of transhumance or no transhumance practiced in some parts of the district. The route of choice of transhumance of herders is stock routes where available and other areas that are not cultivated. The uncultivated areas vary from year to year. The primary concern is to avoid damages to crops which could often result in the imposition of fines. The main road is often used when herders from Nioro Jattaba travel to the neighbouring Kiang East, the most important destination zone outside the district for herders from the district.

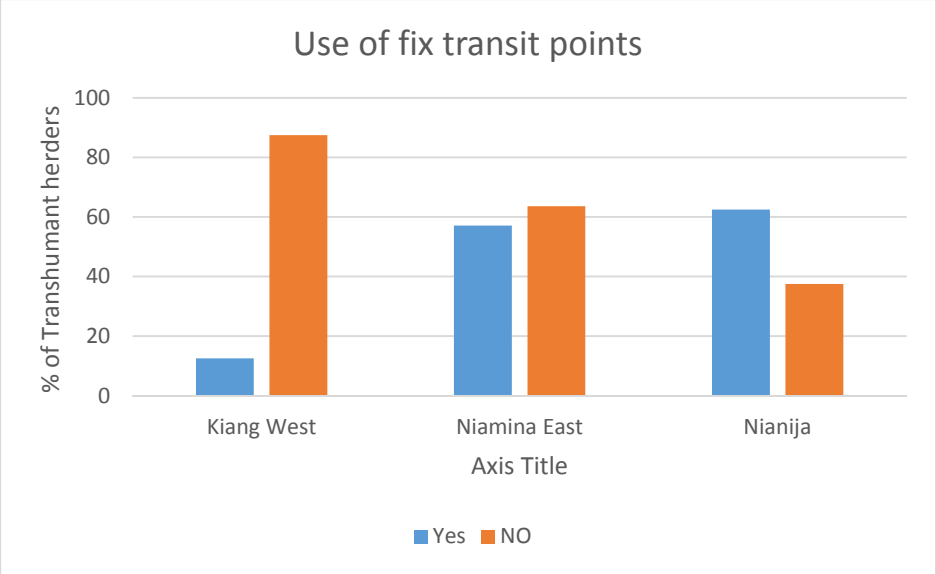
Figure 22: % of Transhumance Herders Using Fix Routes



5.15 Use of fixed transit points

The use of fix transit points by transhumant herders varies from district to district as indicated in figure 23 below. It is highest in Nianija where herders travel longer distances to reach their final destinations. The findings are as follow: 12.5% in Kiang West, 57.1% in Niamina East and 62.5% in Nianija.

Figure 23 Use of fixed transit point



5.16 Length of stay

On Transit

The findings indicate that there is some variation in the length of stay on transit. It varies between few hours to 3 months with the vast majority of herders stopping only for few hours on transit. The short length of stay on transit could be attributed to the fact that for most transhumant herds, the actual distance to final destinations is usually less than 24 hrs. Njie (2012) reported that many of the herds going to transhumance in Central River Region reach their destinations within a day.

Nianija

The findings have revealed that the longest transit stops were in Nianija. This could be attributable to the availability of alternative grazing resources along the routes. It was revealed by the survey findings that herders heading for one destination could end up stopping in another destination for up to a month. The longest stop on transit was in Mbulbuk by transhumant herd from Buduk in Nianija destined to Kass Fula in Niani district as its final destination.

Length of stay of transhumant Herds in the districts

As shown in table 15 the length of stay of transhumant herders during the dry season is 3 to 6 months with average stay period of 4 months. During the rainy season the length of stay is 3- 4 months.

Table15: Length of stay of transhumant herds in Nianija

LENGTH OF STAY OF TRANSHUMANCE HERDS IN NIANIJA DISTRICT	
Name of Village	DURATION
Sinchu Baya	5 Months
Mbayen Burama	5-6 Months
Sare Janko	5 Months
Ngendeh	4-5 Months
Sinchu Demba	4 Months
Chamen	4 Months
Ndrammeh	4-5 Months
Jailand	4 Months
Wellingra Babacarr	4-5 Months
Sare Alpha	4 Months
Daarusalam	4 Months
Medina Njayen	4 Months
Nema Samba	4 Months
Ceesay Kunda	5 Months
Konteh	5 Months
Sinchu Omar	4 Months
Batti Jaha	5 Months
Jamwelly	3-4 Months
Pallelleh	5 Months
Njaw Jahaa	4 Months

5.17 Factors determining the choice of final destination

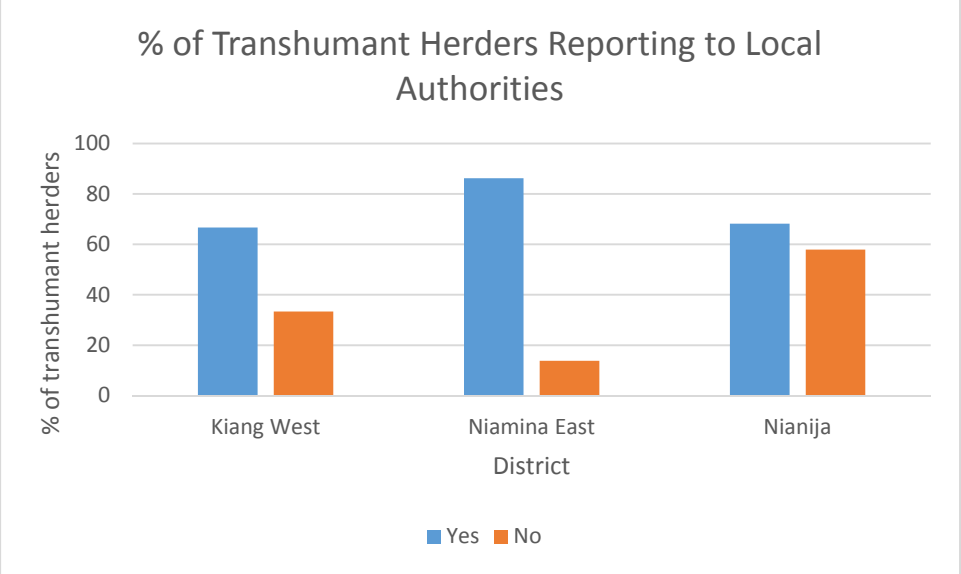
The findings of the survey in all the 3 districts have revealed that the choice of final destination depends on a number of factors, key among which are the availability of sufficient grazing resources (pastures), adequate water for the cattle, large unrestricted grazing space for the animals to avoid conflict with crop farmers and freedom from biting insects (mosquitoes and tsetse flies) as well as other disease related factors. Due to these and other reasons such as social interaction with host communities, transhumant herders tend to be very selective of their host destinations. Over the years, they are have built special relationships with some host communities and they repeatedly go to the same destinations.

5.19 Reporting to local authorities upon arrival

As indicated in figure 24 below, a high percentage of transhumant herders upon arrival in their final destinations report to local authorities. Niamina East has the highest level of herders reporting 86.2%, followed by Nianija 68.2% and Kiang West at 66.2%. They report to traditional village heads.

The findings from the stakeholders qualitative survey in which village heads were questioned on their involvement in transhumance have revealed that despite their roles as custodians of the shared grazing resources only 45.5% in Nianija and 41.7% in Niamina East considered themselves as having been involved in transhumance which in most cases was only limited to their personal involvement as either herders or herd owners. In view of these findings, a lot of sensitization will be needed to enhance the full involvement of village heads in regulating transhumance beyond conflict resolutions. This will enhance efficient and sustainable management shared resources.

Figure 24: % of Transhumant Herders Reporting to Local Authorities



5.20 Requirement of permit to stay at final destination

The findings of the survey have indicated that no permits are required by the transhumant herders within the Gambia to stay in their final destination. However it was reported by 6.8% of transhumant herders from Niamina East that a permit is at times required for transhumant herders in some parts of Senegal. The finding further indicate that the fee for the permit is not fixed and that it varies from Four Hundred Dalasis to One Thousand Gambian Dalasis (GMD400 to GMD1000) equivalent in CFA.

Imposition of permits would help in the regulation of transhumance. Zoo sanitary and environmental requirements could be attached to the issuance of permits. Village heads and Livestock Authorities should be involved.

5.21. Awareness about guidelines or code of conduct on transhumance and level of compliance

As indicated in figure 25 below, there is low level of awareness on the code of conduct by the herders in all the 3 districts. The lowest level was in Kiang West at 10%, followed by Nianija at 40.6% and Niamina East at 41.5%.

The results of the qualitative stakeholders' survey has revealed a better situation. With regards to herd owners the awareness was 69. 6% of respondent in Niamina East, 47.8% of respondents in Nianija and 36.4% of respondents in Kiang West. For Village heads the findings are as follow: 0% in Kiang West, 71.4% in Niamina Eat and 75% in Nianija. All those who are aware of the code cited the control of bush fires and control of uncontrolled cutting down of trees as key fundamental guidelines in the codes.

The level of compliance by herders to the code of conduct is generally low as indicated in Figure 26 below: 1.6% full compliance at Kiang West, 30.85% at Niamina East and 30.2% at Nianija. The low level of noncompliance could be attributed to the high level of unawareness about the code of conduct. The code of conduct is detailed in the Local Conventions on Sustainable Management of the Natural Resources.

The Local Conventions on the Sustainable Management of the Natural Resources have come into effect in all the 3 districts since August 2012. They are sets of agreements undertaken by the community with the support of relevant stakeholders to take charge of their shared natural resources. The use of these conventions is envisaged to support the communities in their drive to enforce regulations on the control of bush fires, illegal cutting of trees, manage use of water and prevent overgrazing. It is strongly believed that good environmental friendly practices must be used in a holistic way and linked to the capacity of the land. The Conventions provide a framework for regulation of transhumance at village. It is thus very crucial to step up sensitization of stakeholders involve in transhumance.

5.22. Awareness about sanitary requirements for transhumance herds and level of compliance

Generally, there is a very low level of awareness among herders on zoo sanitary requirements for transhumance, with lowest level of 1.6 registered in Kiang West, followed by 27.8% in Niamina East and 15.8% in Nianija. The level of compliance is low in all the 3 sites: 1.6% in King West, 17.2% and 7.9% Niamina East and Nianija respectively. To ensure higher awareness and compliance levels, the Department of Livestock has a huge role to play.

Figure 25: Awareness of herders about the code of conduct on transhumance

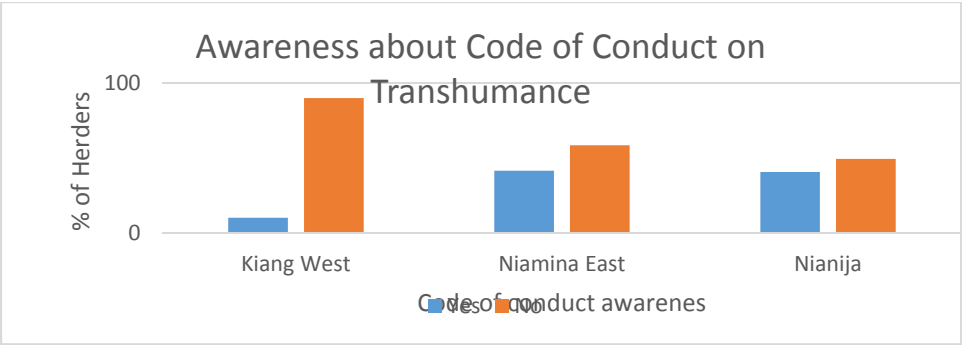
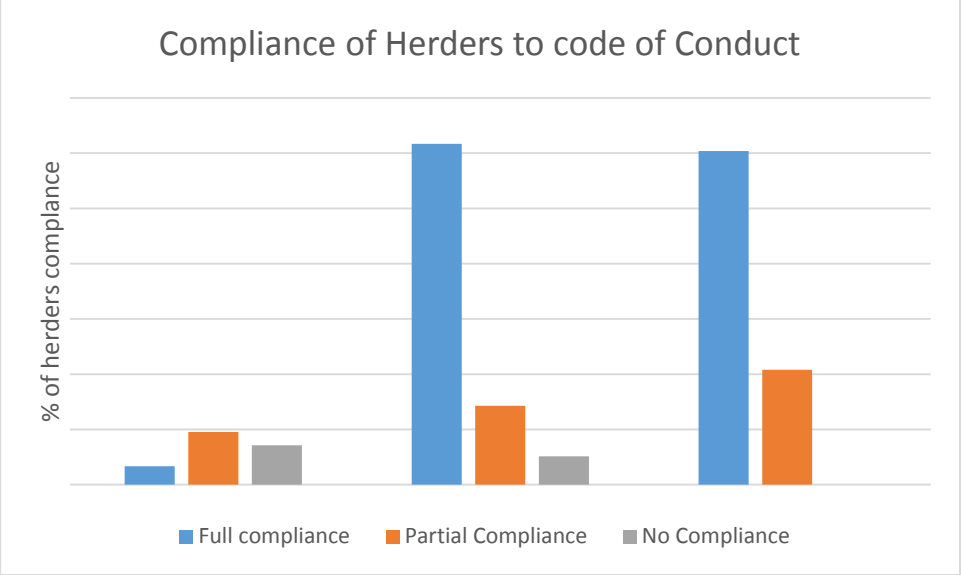


Figure 26: Compliance of herders to code of conduct



5.23. Socioeconomic interaction of transhumant herders with host communites

There is a lot of socioeconomic interactions between the transhumant herders and the host communities that goes beyond the enrichment of crop fields with farm yard manure and enhanced availability and affordability of milk for the host community as 3 evidenced by the following response from stakeholders:

i. Sharing of meals with host communities and contribution to the food basket of their host
ii. Provision of lodging for the vast majority of incoming herders
iii. The construction of temporal residential houses by some transhumance herders in Niamina East where they lodge when on transhumance. According to the district chief they pay their compound rates thereby contributing to revenue generation at district level
iv. Religious, cultural and trade interactions
v. The establishment of close personal and family ties with permanent host over the years, some transhumant herdsmen shift host regularly
vi. Participation in domestic work with the host
vii. Providing draught animals for the host. These animals are periodically replaced if sold
viii. Transhumant herders permanently relocating with their families to settle in their host destinations
ix. Reduction in price of cattle and possibility for the host to buy new stock

5.24. The interaction of transhumant herds with other herds at final destination

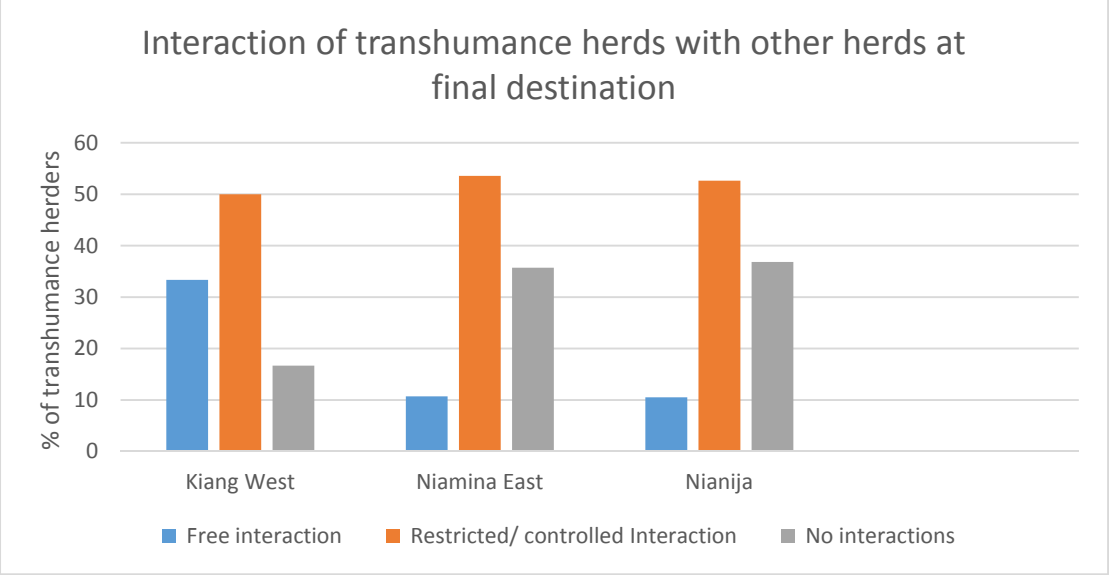
As shown on figure 27 below, the interactions varied from region to region and also within region. For the herders in Kiang west that were involved in transhumance the interactions were mainly restricted interactions 50%, free interactions 33.3% and no interactions 16.7%.

For Niamina East it was: restricted interactions 10.7%, free interactions 53.6% and no interactions 35.8%.

For Nianija it was: restricted interactions 10.5%, free interactions 52.6% and no interactions 36.8%.

The type of interaction among others depend on the management system practiced by the herder involved and the stocking density at the grazing fields The type of interaction between the herds is a major predisposing factor to the possibility of cross breeding occurring as well as for spread of TADS. The high level of free interactions is a source of concern. This should be addressed by herders through better management practices like herding the animals and not to leave them free.

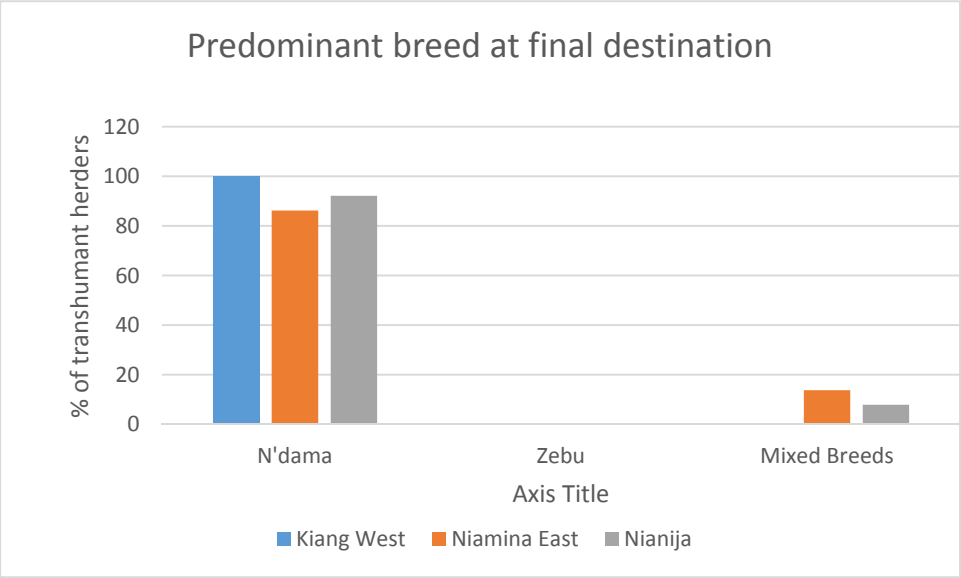
Figure 27 interaction of transhumance Herds with other herds at Final Destination



5.24 Predominant breed at final destination

N'dama cattle is the predominant breed at final destination for all the 3 districts as shown in figure 28 below. In Kiang West, It was exclusively N'dama. There were no destinations with predominantly Zebu cattle 0%. There were destinations with predominantly mixed breeds as cited by 13.8 % in Niamina east and 7.9 in Nianija.

Figure 28: Predominant breeds at Final Destinations



5.25 Predominant breed of arriving transhumant herds

Table 16 and Table 17 below, show the findings of the Herd Owners' and Village Heads' survey respectively on the breed composition of arriving herds. In both surveys N'dama is the predominant breed of arriving herds.

Kiang West

According to the herd owners' survey, in Kiang West 90% of respondent herd owners put the breed composition of arming herds as predominantly N'dama cattle and the remaining 10% of respondent herd owners stated mixed breeds. There was no predominantly Zebu Breed (0%). The Village Head Survey revealed similar findings with 100% of respondents putting the breed composition as N'dama.

Niamina East

In Niamina East, the findings of the Herd Owners Survey revealed that 87% of respondent Herd Owners put the breed composition of arriving herds as N'dama and the remaining 13% of respondents put the breed composition as Mixed. In the village heads' survey the findings were similar with 90.5% of respondents selecting predominantly N'dama and the remaining 9.5% stated Mixed. None selected predominantly zebu herds.

NIANIJA

In Nianija, the findings of the Herd Owners survey revealed 80% of respondent Herd Owners selected N'dama and 20% selected mixed breed. There was no Zebu breed. With regards to the Village Head survey, 65% of respondent selected N'dama and the remaining 35% selected mixed. None selected Zebu.

Table 16:% Respondent Herd Owners Selecting Predominant Breeds Of Arriving Herds

REGION	N'DAMA	ZEBU	Mixed
Kiang West	90	0	10
Niamina East	87	0	13
Nianija	80	0	20

Table 17: % of Respondent Village Heads Selecting Predominant Breeds Of Arriving Herds

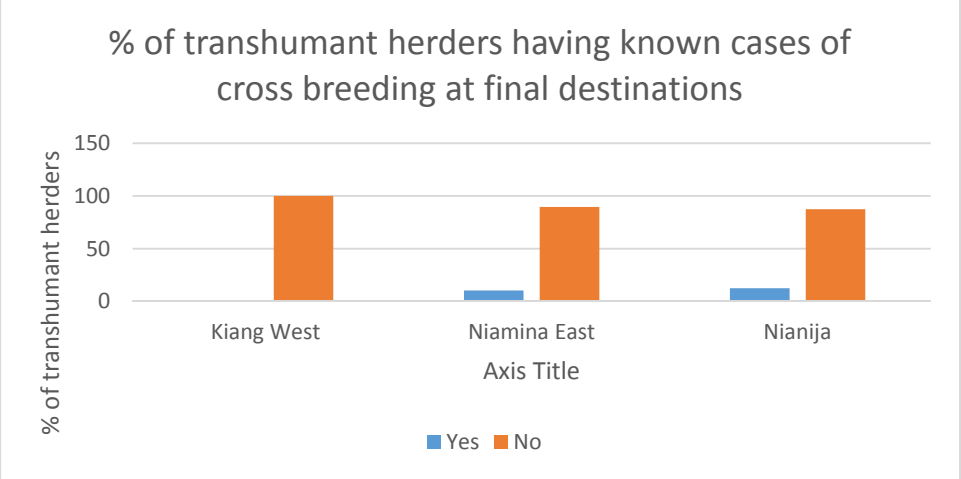
REGION	N'DAMA	ZEBU	Mixed
Kiang West	100	0	0
Niamina East	90.5	0	9.5
Nianija	65	0	35

Considering the mostly unrestricted mating practice and the fact that arriving herds and local herds share the same grazing land with some degree of interaction, there are chances of cross breeding occurring.

5.26. Cross breeding at destinations of transhumant herders

There were no known cases of cross breeding reported in Kiang West. In Niamina East, known cases of cross breeding were reported by 10.3% of transhumant herders and in Nianija 12.5% of transhumant herders as indicated in figure 29 below. In Nianija according to 33.3% of the herders who have known cases of cross breeding, it occurs regularly every year whilst for the remaining 67.7 % it occurs as isolated incidences. In Niamina East 57.2% of transhumant herders stated that it occurs regularly and 42.9% says it occurs as isolated incidences. The findings of the study revealed that there were no known cases of controlled cross breeding in all the 3 sites.

Figure29: X % of transhumant herders having known cases of cross breeding.



5.27 Predominant breeds of arriving transhumant small ruminant flocks

Table 18 and Table 19 below, show the findings of the Women Small Ruminant Owners' and Village Heads' survey respectively on the breed composition of arriving small ruminants. In both surveys the predominant breed of arriving small ruminants is local.

Kiang West

According to the Women owners' survey, in Kiang West 100% of respondent Women Small Ruminant Owners put the breed composition of arming small ruminants as predominantly local. There were neither mixed nor Sahelian breeds. The Village Head Survey revealed similar findings with 100% of respondents putting the breed composition as local.

Niamina East

In Niamina East, the findings of the Women Small Ruminant Owners Survey revealed that 81.9% of respondents put the breed composition of arriving small ruminant flocks as ERL and the remaining 18.1% of respondents put the breed composition as Mixed. In the village heads' survey 60.9% of respondents selecting predominantly ERL breeds and the remaining 39.1% stated Mixed. None selected predominantly Sahelian herds.

NIANIJA

In Nianija, the findings of the women small ruminant owners' survey revealed 53.9% of respondents' selected ERL breeds and 46.1% selected mixed breed. There were no Sahelian breeds. With regards to the Village Head survey, 12.5% of respondent selected Local breeds and 12.5% selected Sahelian. The remaining 75% selected Mixed. This indicates that the overwhelming breeds of transhumant small ruminants coming into Nianija district are non ERL (87.5%). This is an identified risk factor for genetic dilution.

Considering the type of management system practiced for small ruminants i.e. free range system with uncontrolled mating, and also taking into account the breed composition of arriving herds, It is proper to highlight that there is risk of genetic dilution through uncontrolled cross breeding between the local breeds and the arriving mixed and Sahelian breeds depending on the district. In Nianija district, the level of risk is high, in Niamina East the risk is low and in Kiang West the risk does not exist.

Table 18: % of Respondent Small Ruminant women farmers selecting Predominant Breeds of Arriving Small Ruminant Flocks

REGION	ERL	Sahelian	Mixed
Kiang West	100	0	0
Niamina East	60.9	0	39.1
Nianija	53.9	0	46.1

Table: 19 % of Respondent Village Heads selecting Predominant Breeds Of Arriving Small Ruminant Flocks

REGION	ERL	Sahelian	Mixed
Kiang West	100	0	0
Niamina East	81.9	0	18.1
Nianija	12.5	12.5	75

5.28. Significant advantages of each breed

The findings of the survey have shown that there exist a level of awareness on the comparative advantages and disadvantages of each breed at all the 3 sites.

The Advantages sited for N'dama were centred on its trypanotolerant and diseases resistance traits, adaptation to the existing hostile environment and good quality as working oxen. The disadvantages cited were its small size compared to Zebu and mixed breed as well as its low milk yield.

For Zebu and Mixed breeds the advantages put forward by the respondents were large body size which means more income for herd owners if sold. Higher milk yield was also cited. The disadvantages were susceptibility to diseases in general and trypanosomiasis in particular.

In response to the question posed to herders on the preferred the composition of their herds if all conditions were to remain equal, 98.3% of herders in Kiang West preferred N'dama cattle and the remaining 1.3% preferred a predominantly N'dama herd with few mixed breeds in the herd. 96.4% in Niamina East preferred exclusively N'dama cattle herd with the remaining 3.6 % preferring predominant N'dama herds with few mixed breeds and zebu in the herd. In Nianija it was 98.2% preferring exclusively N'dama Herd with the remaining preferring predominantly N'dama herds with few mixed breeds and few Zebu cattle in the herds.

5.29. Experience of conflicts with host communities on transit or final destinations

There were no conflicts encountered with host Communities in Kiang West. However, conflict was encountered by 7.4% of herders in Niamina East and 5.5% in Nianija. According to the findings, the conflicts were all related to disputes with crop farmers. Most of the conflicts were due to cattle destroying farmers' crops at the fields. These conflicts were resolved through mediation of the village head at times amicably at times with the imposition of fines which depend on the level of crop damage caused. There were also conflicts related to stock routes as well as conflicts related to some herders' reluctance to fertilize the crop farms. In Nianija, there is a system in place to reduce conflict with rice farmers as well as also to maximize benefits from transhumance. Herders are not allowed to go to the

rice fields before 15th March every year. This allows the rice to be harvested and transported. However the herders are required to come to the villages before that period so that the cattle can fertilise the maize and millet fields.

The stakeholders' survey revealed some social conflicts including marital conflicts in communities in which transhumant herders were reportedly implicated.

5.30. Transhumant herders permanently relocating to settle in the districts

In all the 3 districts there were known cases of transhumant herders permanently relocating with their families. The district with the highest known cases of transhumant herders permanently relocating is Kiang West. 85.1% of respondent head owners in Kiang West have known cases of permanent relocation of transhumant herders, in Niamina East it was 69.6% and in Nianija 10.5%. Herders coming from as far as Central River Region were among those who relocated to the district. The reasons given for the relocations were the availably of wide grazing space and pastures. The distance from their original homes has made it unfeasible to continue with the seasonal transhumance thus the decision to relocate with their families.

5.31. Adverse effects of transhumance on the environment

The results presented in Figure 30 below show the response of herders in the 3 districts to the question on the adverse effects of transhumance on the Environment. A high percentage of herders in all the 3 districts are not aware of the adverse effects on transhumance on the environment. The findings were as follow: 60.5% in Nianija, 39.2% in Niamina East and 30% in Kiang West.

Overgrazing, cutting down of tree branches, bush fires, destruction of crops, competition for water, erosion and environmental pollution were the main adverse effects of transhumance captured in the survey findings. The magnitude of each effect varies from district to district to district.

In Niamina East, cutting down of tree branches by transhumant herders for feeding of livestock was the main environmental concern. Visiting transhumant herders mainly from Upper River Region have been reportedly implicated in the practice. Cutting down of forest tree to feed livestock is a contributing factor to deforestation which considered as a leading cause of environmental degradation in the Gambia. The species mostly affected are Khaya senegalensis, Pterocarpus erinaceous and Cordula Africana. These species are already on the verge of being endangered by illegal logging due to their high market value. Small ruminant transhumant flocks from Senegal have also been implicated in this practice as revealed by the findings of the survey.

Another major adverse effect of unregulated transhumance on the environment is uncontrolled bush fires. Bushfires greatly modify the forest environment through degradation, transformation and fragmentation of forest ecosystems, often resulting in reduce species richness and density, erosion of genetic diversity and ultimately to the extinction of locally adapted population and species. The findings of the qualitative stakeholders' consultative survey have highlighted reports of accusations and counter accusations between transhumant herders and the host community regarding the origin/cause of bush

fires with each party blaming each other. However what evident is the fact that bushfires are caused by careless actions of humans. Therefore, risk prone practices such as burning of the aquatic weeds for their regrowth and making fires in pits on the ground for brewing of local tea should be completely abandoned. To prevent bush fires, public education and awareness campaigns for attitudinal change are among the most important tools. This will require the full cooperation of the host community and the transhumant herders.

Overgrazing of pastures was reported in all 3 districts. 26.3% in Nianija, 23.2% in Niamina East and 3.3% in Kiang West. The relative higher percentage in Nianija could be attributed to a combination of factors including an expansion of settlements in the district which also led to conversion of grazing lands for crop production and decrease fallow-periods in arable lands. Furthermore, regular bush fires, overstocking/ imbalanced distribution of animals over the rangelands, diminish soil fertility, carrying capacities, and high stocking rates are all contributing factors to the growing problem of over grazing.

Destruction of crop farms by transhumant herds was reported in Niamina East (3.6%) and in Nianija (13.1%) as an adverse effect of transhumance. The underlining factors in this are the disappearance of traditional stock routes, expansion in rice cultivation and encroachment into traditional lowland grazing resources.

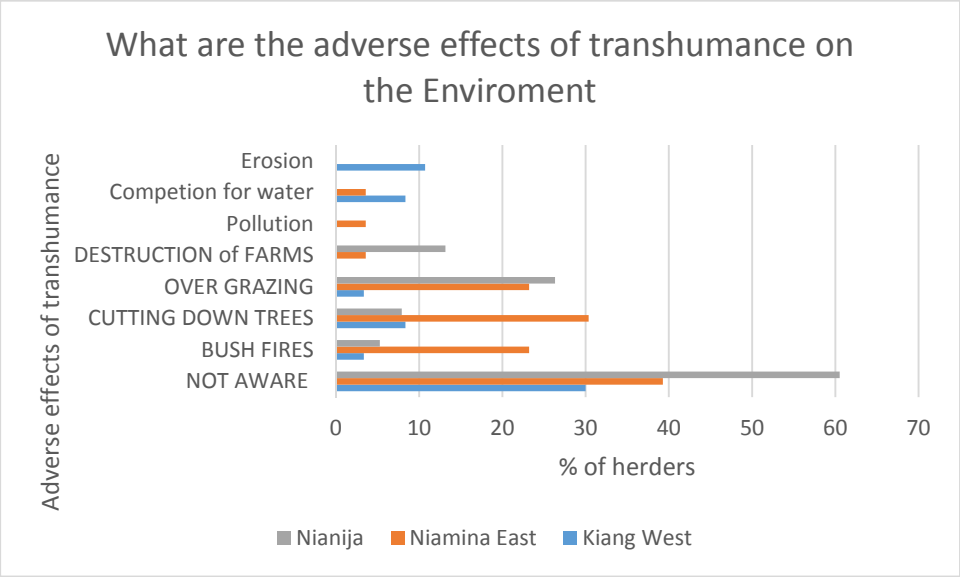
Competition for water was also reported in Kiang West 8.3% and Niamina East 3.5%. During the rainy season, animals use swamps, tributaries and the River Gambia for water sources As the dry season advances low river water and receding swamp waters lead to increase in salinity and decrease fresh water surface availability. Under such conditions of water scarcity the competition becomes high.

Pollution was reported in Niamina East. It was attributed to the dust in the environment as large numbers of cattle move to their grazing and watering points on daily basis.

Erosion was been reported in Kiang West. It was linked to cattle sharing the same village roads with people which leads to the erosion of the road sides.

The stakeholders' survey also highlighted additional issues such destruction of habitats through trampling on generating forest trees and introduction of unpalatable species.

Figure 30: ADVERSED E FFECTS OF TRANSHUMANCE ON THE ENVIRONMENT



5.32. Beneficiary effects of transhumance on crops

The findings indicate a high level of awareness on the beneficial effects of transhumance on crops. With the high cost of fertilizer, farmers in host communities totally rely on farm yard manure to fertilize their crop fields. There is higher crop yield and higher income for crop farmers in all recipient communities.

In Niamina East, the transhumance hosting communities have the most fertile land in the district. As a result of that, the crop yield is highest in these areas. Water melon and pumpkins are readily cultivated. These two crops have transformed farmers' livelihood.

5.33. Recommendations of respondents on the improved management of transhumance

On the improved management of transhumance the following responses were provided by the respondents in the survey:

- Provision of stock routes to facilitate movement of animals to grazing sites thereby reducing conflict with crop farmer due to crop damages
- Sensitization on the local conventions on sustainable management of management of natural resources to enhance compliance
- Mandatory animal health requirements like veterinary certificate that will provide proof of vaccination
- Regulating the number of cattle entering into the grazing sites in the districts
- Provision of bore holes along the riverine areas as saline intrusion occurs towards the end of the dry season
- Involvement of transhumant herders in bush fire control (fire belts)
- Prior sensitization of transhumant herders not to cut down trees

- Mandatory requirements for herders to base their herds on village farms to fertilize them
- Host to help in the provision of pegs for the cattle
- Pasture Management
- Enhance dialogue between the community and herders

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSIONS

In the Gambia transhumance is a well-known practice that has for years been an integral part of the traditional livestock production system as a cooping strategy to deal with shortages of feed, water, and grazing land as well avoidance of pest and diseases. The results of the survey strongly indicate that transhumance is highly organised in the Gambia but unregulated. However at community level, local conventions on sustainable management of natural resources provide a framework for the regulation of transhumance at district level. This has already started to take effect in both Nianija and Niamina East. However to enhance implementation and enforcement of compliance, a lot more needs to be done in terms of sensitization of the entire communities in general and of the major stakeholders in particular.

The findings indicate a high level of awareness on the beneficial effects of transhumance on crops. With the high cost of fertilizer, farmers in host communities totally rely on farm yard manure to fertilize their crop fields. There is higher crop yield and higher income for crop farmers in all recipient communities.

According to the findings of survey, The adverse effects of transhumance on the environment include overgrazing, cutting down of tree branches, bush fires, destruction of crops, competition for water, erosion, destruction of habitats, introduction of unpalatable species and environmental pollution.

Identification and assessment of a number of predisposing risk factors highlighted in the findings of the survey including breed composition of arriving herds and herds at final destination, level of interactions, length of stay, breeding practice and frequency of cross breeding indicate that with regards to cattle, there is risk of genetic dilution through crossbreeding with transhumant mixed breeds though the risk could be considered as low risk. N'dama cattle is the predominant breed of herds at the final destination for all the 3 districts and there were no destinations for all the 3 districts with predominantly Zebu cattle (0%). Cross breeding between the N'dama and mixed breeds constitute the primary risk. In Kiang West there was zero risk as it was exclusively N'dama involved. However, there were some destinations for herds from Niamina East and Nianija with predominantly mixed breeds as cited by 13.8 % of herders Niamina East and 7.9% of herders in Nianija. In Niamina East and in Nianija known cases of cross breeding were reported by 10.3% of transhumant herders and 12.5% of transhumant herders respectively. In Nianija according to 33.3% of the 12.5% of herders who have known cases of cross breeding, it occurs regularly every year whilst for the remaining 67.7 % of the 12.5% it occur as isolated incidences. In Niamina East 57.2% of 10.3% herders who have known cases of cross breeding stated that it occurs regularly and 42.9% says it occurs as isolated incidences. The type of interactions both at home and at final destinations is the major predisposing risk factor to the possibility of cross breeding occurring. There

is a high level of free interactions though it varies from region to region. For the herders in Kiang West that were involved in transhumance the interactions were mainly restricted interactions 50%, free interactions 33.3% and no interactions 16.7%. For Niamina East it was; restricted interactions 10.7%; free interactions 53.6% and no interactions 35.8%. For Nianija it was: restricted interactions 10.5%, free interactions 52.6% and no interactions 36.8. The risk of cross breeding could be minimised by better management practices during transhumance mainly by controlling the level of interaction with other herds.

With regards to small ruminants, taking into account the predominantly uncontrolled mating and free range system management system practiced coupled with relatively high proportion of mixed and Sahelian breeds in the composition of arriving herds, it is proper to highlight that there is risk of genetic dilution through uncontrolled cross breeding between the local breeds and the arriving mixed and Sahelian breeds. The level of the risk involve depends on the district. In Nianija district, the level of risk is high, in Niamina East the risk level is low and in Kiang West the risk does not exist as only local breeds arrive in the district for transhumance.

The findings of the survey indicated that the high risk of introductions of Transboundary Animal Diseases (TADs) through unregulated transhumance poses a real threat to endemic ruminant population in The Gambia. The reintroduction of CBPP into the country in 2012, after 41 years of absence of the disease is a testimony to that.

The beneficial effects of transhumance as it is practiced in the Gambia far out weights its adverse effects. It is the foundation pillar upon which low input sustainable crop and livestock production is built. However there are major challenges confronting transhumance which needs to be addressed. These challenges include the unregulated nature of the practice, equitable and sustainable utilization of natural resources for both sustainable livestock and crop production and prevention and control of Transboundary Animal Diseases (TADs) such as Foot and Mouth Disease (FMD), Lumpy Skin Disease (LSD) and Contagious Bovine Pleuropneumonia (CBPP).

Furthermore, the livestock sector policy of the Gambia has not fully responded to some of the above and other emerging challenges such as animal genetic resources management including the protection/ conservation of indigenous/endemic breeds, equitable and sustainable management of the country's range and livestock feed resources base including encroachment on traditional lowland grazing areas for rice cultivation and the regulation of cross border transhumance. There is therefore the need for policy response to adequately address the above issues highlighted. Regulation of transhumance and the efficient management of dual purpose lands for grazing, crop production and rice cultivation provides a viable alternative.

Transhumance if controlled, properly managed and regulated could provide the key to sustainable utilisation of dual purpose lands.

6.2 RECOMMENTATIONS

TO GOVERNMENT

1. To develop a National transhumance policy within the framework of existing and emerging national and regional initiatives in terms of building on best practice, policy coherence and policy harmonization
2. To collaborate closely with Senegal within the framework of a bilateral cooperation agreement between the Ministries in charge of livestock in the two countries. This will enhance harmonised regulations on the control of Transboundary Animal Diseases and the regulation cross border livestock movements geared towards improved management of cross border transhumance through measures such as issuance of vaccination certificates and movement permits or "laissez–passer sanitaire" and identification of vaccinated cattle guided by ECOWAS Protocol on Transhumance.
3. To formulate an appropriate national pasture policy within the overall framework of an updated more responsive National Livestock Policy
4. To Provide the necessary infrastructure to support transhumance which will include stock routes/ transhumance corridors, and watering facilities such as bore holes along the Riverine areas
5. To update disease control policy so as to reflect current and future needs in particular prevention and control of emerging and re-emerging Transboundary Animal Diseases
6. To develop a comprehensive national policy on Animal Genetic Resources which will include the protection of endemic ruminant livestock breeds

TO THE COMMUNITY AND DISTRICT AUTHORITIES

1. To update local conventions to reflect the need for enhanced community regulation of transhumance including provisions for an opening and closing dates for grazing, placing limits on cattle numbers for the access of grazing fields,
2. To conduct Community sensitizations on the local conventions on sustainable management of natural resource including control of bush fires
3. Sensitization of transhumant herders in their zones of origin prior to departure on need to avoid environmentally harmful practices such as cutting of trees branches for feeding livestock
4. To encourage dialogue with transhumant herders to foster better understanding and cooperation with community
5. To establish Producer Associations and establish linkages with their well organised counterparts in Senegal to provide a common forum for discussions

TO THE DEPARTMENT OF LIVESTOCK SERVICES

1. To enhanced control of TADs
2. To provide affordable and accessible veterinary services at village level

3. To regulate and enhance livestock movement
4. To build the capacity of livestock farmers on improve livestock production systems, feed conservation, integrated pasture management and crop livestock integration
5. Close collaboration with the Department of Forestry and other stakeholders within the framework of multi sectoral approach to natural resources management
6. To conduct an inventory of range resources in the country
7. To train and establish community participatory epidemiosurveillance teams at major transhumance recipient zones throughout the country
8. To enhance provision of facilities such as stock routes and watering points at both the source and destination zones

TO TRANSHUMANT HERDERS

- To comply with local conventions on sustainable management of natural resources including the requirement to base their herds in village farms.
- To ensure compliance with zoo sanitary regulation

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List of Annexes

Annex 1

QUESTIONAIRE FOR HERDERS

CONSENT

This is a study to find out the adverse effects of transhumance on the management of endemic ruminant genetic resources in the Gambia. The result will help government and other stakeholders to better plan and manage transhumance for the benefit of all stakeholders and for sustainable management endemic ruminant livestock and habitats. Total confidentiality is assured and your voluntary participation in the study is needed and highly appreciated.

Date of interview: …….

Place of interview: ……

Name of Interviewer:……

District: ……

Village:……..

Name of Herder:……

Size of the Herd:……..…

Herd Ref No. : ……

1. What do you understand by transhumance?

2. Are you aware of any form transhumance being practice in the village or district in the past 5 years? (this refers to any herders inhabitant of the village who going elsewhere for the transhumance or to any foreign herders coming in the village / district to perform transhumance)
    A) Yes
    B) No
3. If no: Why?
4. If Yes: which kind of transhumant have been involved?
    A) Herders of your village
    B) Herders of neighbouring villages
    C) Herders for remote villages that are part of your district
    D) Herders from other district

E) Herders from other countries

5. If yes, what species have been involved?
    A) Cattle
    B) Small ruminants
    C) Both
6. How do you assess the level of transhumance made outside the district by you and your collegue? (for each choice, please explain why)
    A) High level (Widely Practiced on large scale)
    B) Medium level (practiced but not widely)
    C) Low level (rarely Practiced)
    D) No transhumance

7. How do you assess the level of transhumance made inside the village/district by foreigners? (for each choice, please explain why)
    A) High level (Widely Practiced on large scale)
    B) Medium level (practiced but not widely)
    C) Low level (rarely Practiced)
    D) No transhumance
8. What major roles does the Village/District play in transhumance
    A) Serve as recipient/ host destination of transhumant livestock
    B) Serve as source/ departure point of Transhumant livestock
    C) Serve as transit zone for Transhumant livestock
    D) Serve as both host destination and also as source of transhumant livestock
    E) Not involved in transhumance
9. Have you ever been personally involved in transhumance?
    A) Yes
    B) No
10. If no why?

11. If yes, in what ways have you been involved?

12. In your View, why do herds/small ruminant flocks go on transhumance go on transhumance?
    A) In search of feed
    B) In search of water
    C) Both feed and water
    D) To avoid diseases / health problems
    E) To get in touch with key actors/markets to sale animals / products / by-products / services
    F) To get in touch with key actors to buy or exchange animals / products / by-products / services
    G) Others (specify)

13. Do herders in the village plan to go together on transhumance?
    A) Yes
    C) No
14. Which season of the year do herds usually depart from your village for transhumance?
    A) Just Before or at the onset of the rainy season
    B) At the end of the rainy season or early dry season
    C) Middle dry season
    D) Other time frame:……
15. Which season of the year do herds/small ruminant flocks usually arrive in your village/ district for transhumance?
    A) Just Before or at the onset of the rainy season
    B) At the end of the rainy season or early dry season
    C) Middle dry season
    D) Other time frame:……

16. Which season of the year do arriving herds from other destinations usually depart from your village?
    A) Just before the Onset of the rain
    B) At the end of the rainy season or early dry season
    C) Middle of the rainy season
    D) Other time frame

17. What is the composition of breeds of cattle in your herd?
    A) N'dama Cattle Number of heads……
    B) Zebu No. of heads……
    C) Mixed No. of heads ……
    D) Others (specify the race) No. of heads …….
18. When (year) did the first cattles different from n'dama were integrated in your herd
19. How?
    A) By buying,
    B) As gift
    C) Exchanging
    D) Accidentally
    E) Other
20. What reasons led you to definitely accept/ integrate the non-Ndama cattles in your herd?.
21. How are your cattle housed?
    A) Open Kraal or pen
    B) Roofed Kraal or pen
22. What is the average number of milking cows in your herd?
23. What is the average number of milking cows for each breed
    A) N'dama Cattle Number of heads……

B) Zebu No. of heads……
C) Mixed No. of heads ……
D) Others (specify the race) No. of heads …….

24. What is the average milk yield per day in your herd during peak period?
25. How many milking cow are involved during the peak period?
26. What is the average milk yield per day during low period?
27. How many milking cow are involved during the peak period?
28. On average how many heads of cattle do you sell or remove from your herd annually?
29. How many heads of cattle did you lost to disease during the past year?
30. In order of importance, list the 3 biggest challenges to cattle production in your village/ district?

31. How do you graze your cattle?
    A) Natural Pastures only
    B) Natural pastures and other conserved feed sources
    C) Do you experience feed shortages for your cattle?
        A) Yes
        B) No
32. Is Mating controlled in the herd?
    A) Strictly controlled
    B) Loosely controlled
    C) Uncontrolled
33. Which group are excluded from the herds going on transhumance and why?
34. Do you take any specific measures to protect your herd prior to departure on transhumance?
    A) Yes
    B) B) No
35. If yes what measures do you usually take to protect your herd prior to departure?

36. Have you ever encountered any disease outbreaks on transit or at your final destination in the last 5 years?
    A) Yes
    B) No
37. If yes, where? what was the disease and were you familiar with it at your home village?

38. Did you encounter any mortalities in the past 5 years during transit on transhumance?
    A) Yes

B) No

39. If yes how animals died?
    A) 1-3 heads of cattle
    B) 4 to 5 heads of cattle
    C) More than 5 heads of cattle
40. Which route did you take to your destination?
41. Is it a fix route used by other herders?
    A) Yes
    B) No
42. Do you have fix transit points along the route?
    A) Yes
    B) No
43. How long do you stay on transit?
44. In what ways do you interact with your host on transit?
45. Where did you transit and for how long did you stay there?
46. What factors determine the length of stay at your destination?

47. How long does it usually take you from departure date to get to your final destination?
48. Where is your final destination?
49. What factors determine the choice of your final destination?
50. Do you report to any local authorities on arrival at your final destination?
    A) Yes
    B) No
51. If yes, who do you report to?
52. Do you requite any permits or authorisation to stay at your final destination?
    A) Yes
    B) No
53. If yes is there any fees for the permit?
    A) Yes
    B) No
54. If yes what is the amount prescribed for the permit and how do you consider the amount?
55. Are you aware of any guidelines or code of conduct for transhumant herders on transit or at final destination with regards to sustainable management of the natural resources?
    A) Yes
    B) No
56. If yes, briefly state the guidelines you know

57. Are you aware of any sanitary/veterinary requirements for transhumant herds at final destinations?
    A) Yes
    B) No.

58. If yes, what is your level of compliance?
    A) Full compliance
    B) Partial compliance
    C) Non compliance
59. In what socio-economic ways do you interact with your host at your destination?

60. How does your herd interact with other herds at your final destination?
    A) Free interaction
    B) Restricted/ controlled Interaction
    C) No interactions
61. What is the predominant breed of cattle at your destination?
    A) N'dama cattle
    B) Zebu
    C) Mixed Breeds
62. Has there been any known cases of cross breeding with herds at your destination?
    A) Yes
    B) No
63. If yes, how regular was it?
    A) Occurs regularly every year
    B) Occurs at times but not every year
    C) Isolated incidence occur

64. If yes, what was the nature of the cross breeding?
    A) Controlled
    B) Uncontrolled
    C) I don't know
65. In your view what are the main significant advantages of each breed?
66. In your view what are the main significant disadvantages of each breed?
67. Taking in to account all parameters (resistance to disease, productivity) what should be the ideal structure of your herd in terms of breed:
    A) N'dama Cattle
    B) Zebu No. of heads……
    C) Mixed No. of heads ……
    D) Others (specify the race) No. of heads …….
68. Did you or other transhumant herders ever experience any conflict with host communities on transit or at your destination?
    A) Yes
    B) No
69. What was the nature of the conflicts and how were they resolved?

70. In your view what are the adverse effects of transhumance on the environment in host /destination zones?
71. What are the beneficial effects of transhumance on crops?
72. What recommendations do you have for the improved management of Transhumance for the benefit of all those concern?

ANNEX II

QUESTIONNAIRE FOR STAKEHOLDER CONSULTATIONS/ INTERVIEWS

CONSENT

This is a study to find out the adverse effects of transhumance on the management of endemic ruminant genetic resources in the Gambia. The result will help government and other stakeholders to better plan and manage transhumance for the benefit of all stakeholders and for sustainable management endemic ruminant livestock and habitats. Total confidentiality is assured and your voluntary participation in the study is needed and highly appreciated.

Date of interview: …….

Place of interview: ……..……

Name of Interviewer:……

District: ……

Village:……..

Name of Interviewee/ Respondent:……

Designation of Interviewee/ Respondent:……..…

Ref No. : ……

1. What do you understand by transhumance?

2. Are you aware of any form transhumance being practice in the village or district in the past 5 years?
   A) Yes
   B) No

3. What species have been involved?
   A) Cattle

B) Small ruminants

C) Both

4. How do you assess the level of transhumance in the district?

A) High level (largely practiced)
B) Medium Level (practiced but not widely
C) Low level (rarely practiced)
D) No transhumance

5. What has been the trend of transhumance in the village/district in the past 5 years?

6. What roles does the District play in transhumance
   A) Serve as recipient/ host destination of transhumant livestock
   B) Serve as Source/ departure point of Transhumant livestock
   C) Serve as transit zone for Transhumant livestock
   D) Serve as both host destination and also as source of transhumant livestock
7. Have you ever been personally involved in transhumance?

A) Yes

B) No

8. If yes, in what ways have you been involved

9. In your view, how can your specific involvement in transhumance be enhanced?

10. In your view, why do herds/ small ruminant flocks go on transhumance?
    A) In search of feed
    B) In search of water
    C) Both feed and water
    D) Others
11. Which season of the year do herds/small ruminant flocks usually arrive in your village/ district for transhumance?
    A) Just Before or at the onset of the rainy season
    B) At the end of the rainy season or early dry season
    C) Middle dry season
    D) Other time frame:……
12. What are the Predominant breeds of arriving transhumant herds
    A) Predominantly N'dama Cattle
    B) Predominant Zebu
    C) Predominantly Mixed breeds
13. What are the predominant breeds of arriving small ruminants

A) Predominant trypanotolerant sheep and goats
B) Predominantly non trypanotolerant breeds
C) Predominantly mixed breeds

14. What is the generally the overall length of stay of transhumant ruminants in the district?

15. What are the main overall socio-economic interactions with the arriving herders?

16. What are the main overall ecological interactions of arriving animals with the environment and with the animals?

17. How are your small ruminants housed?

18. On average how many heads of sheep and goats do you sell or remove from your herd annually?

19. Besides natural pastures, do you use other feed resources to supplement your small ruminants?
A) Yes
B) No, I only used natural pastures

20. If yes what supplementary feed resources do you use?

21. Is small ruminant mating controlled
A) Strictly controlled
B) Loosely controlled
C) Uncontrolled

22. Have you ever heard of any conflicts between arriving transhumant herders and the host community in the district?
A) Yes

B) No

23. What was the nature of the conflict and how was it resolved?

24. Do you know of any locally established code of conduct or guidelines on management of pastures and other feed resources in this District?
A) Yes
B) No

25. In your view what is the level of compliance of transhumant livestock herds?
A) They mainly comply
B) They partially comply
C) They do not comply

26. What is over grazing?

27. How can overgrazing be controlled?

28. Are you aware of any livestock disease outbreaks with mortalities in the village/ district linked to in coming transhumant livestock?
    A) Yes
    B) No
29. Do you know of any cases of transhumant Herders permanently migrating with their livestock to settle in the District?
    A) Yes
    B) No
30. In your view what are the adverse effects of transhumance on the environment in host /destination zones?

ANNEX III

Report on Validation Workshop on the Adverse Effects of Transhumance in The Gambia.

1. Introduction

PROGEBE Gambia National Coordination in collaboration with stakeholders officially validated the report of a study commissioned by International Trypanotolerance Centre (ITC) on transhumance in The Gambia on the 9th -10th December 2014 in Jenoi Lower River Region. The validation workshop was organized within the framework of the project on Assessment of the Impact of Transhumance on the Sustainable Management of Animal Genetic Resources which is part of the portfolio of projects submitted under the First Call for Proposals related to the FAO Trust Account in support of the Global Plan of Action (GPA) for Animal Genetic Resources for the biennium 2013-2014 and approved for funding by the Commission on Genetic Resources for Food and Agriculture (GCP/GLO/287/MUL The overall objective of the project is to provide a better understanding of the impact of transhumance to the sustainable management of endemic ruminant livestock in Sahelian areas of The Gambia, Guinea, Mali and Senegal.

The validation workshop brought together stakeholders from Government Departments, Livestock Farmers, village and district authorities with valid interest in sustainable livestock development and conservation of shared natural resources and habitats.

In attendance were district chiefs from PROGEBE Project sites of Kiang West, Niamina East and Niamina. Also in attendance was representative from PROGEBE National coordination Dr Ibrahim Mara and Dr Dongmo the Regional Consultant for the transhumance study. The occasion was graced by the Governor of Lower River Region Mr. Salifu Puye who officially delivered the official opening statement. PROGEBE National Coordinator Mr. Famara Sanyang and PROGEBE sites coordinators were in attendance.

Please find the list of participants attached to this report.

2. Objectives of the Validation Workshop

The overall objectives of the validation workshop is to develop a sustainable framework of transhumance management by examining and analysing in practice in perspective of the consultancy report. The other objectives include:

- To analyse the problems and recommend possible solutions
- To analyse the benefits and recommend ways to maximize them
- To device a management framework
- Identify and allocate rolls to major stakeholders
- Address polices affecting transhumance

3. Opening Ceremony

The opening ceremony was chaired by M. Lamin Saine Deputy Director General, Department of Livestock Services. He thanked the participants on behalf of PROGEBE, ITC

and The Government of The Gambia for attending the validation. He gave an overview of the importance of the livestock sector to the Gambian Economy and to the livelihood of the population. He however noted that the sector is faced with challenges which include deterioration of habitats attributable to bush fires, firewood collection, low rainfall an over grazing. He emphasized the need for conservation of livestock habitats through general sensitization and farmer training on sustainable natural resources conservation. With regards to regulation of transhumance the noted that at national level much needs to be done. He stressed the importance of the validation workshop as a key step towards better understanding of transhumance as it is practiced here in The Gambia and map out sustainable transhumance mechanisms. Furthermore, he noted the need for policy guidance as the Agriculture and Natural Resources Policy (ANR) does not have clear cut strategies attached. He used the opportunity to task the participants to develop key messages.

In delivering his remarks, the Regional Livestock Officer for Lower River Region Mr. Ousman Sanyang that the study on transhumance provides an opportunity to look at sustainable ways of managing transhumance.

Dr Famara Sanyang PROGEBE National Coordinator noted the importance of transhumance as a cooping strategy for farmers. He noted that the study has a sub-regional dimension as similar studies were conducted simultaneously in Senegal, Mali and Guinea. He also outlined that PROGEBE has conducted two studies on transhumance which were limited in scope. Dr Sanyang highlighted that due to some key challenges facing livestock development including expansion of settlements and horticultural gardens livestock farmers are forced to move out with their animals. He concluded that the inputs of participants is crucial in mapping out way forward.

In his remarks Dr Ibrahim Mara the regional facilitator for the study highlighted the need for an action plan to prepare a project proposal that will comprehensively address the key findings of the study.

In delivering the opening statement the Governor of Lower River Region Mr. Salifu Puye stated the importance of livestock to the livelihood of the population noting that the region is proud to host the validation workshop. He expressed his gratitude to PROGBE and ITC for the conduct of the study. He also used the opportunity to thank PROGEBE for the numerous interventions done in his region that positively impacted on the lives of the population.

4. PRESENTATIONS

The Opening ceremony was followed by presentation of the findings of the report by the National Consultant Dr Kebba Daffeh. He gave an overview of the findings of the study noting that Transhumance is widely practiced on a large scale in some parts of the country as a resilience strategy to cope with shortages of feed and water as well as for avoiding pest, diseases and conflict due to tight environment for grazing. He reported that there is high level of awareness on the beneficial effects of transhumance on crops noting that with the

high cost of fertilizer, farmers in host communities totally rely on farm yard manure to fertilize their crop fields. There is higher crop yield and higher income for crop farmers in all recipient communities.

He further noted that the practice is highly organised but unregulated. According to him, the unregulated nature of the practice poses the most serious challenge to its sustainability. Dr Dafffeh stated that unregulated transhumance poses a serious threat to the environment and to the conservation of endemic ruminant livestock. According to him, the study revealed that the adverse effects of transhumance on the environment include overgrazing, cutting down of tree branches, bush fires, destruction of crops, competition for water, erosion, destruction of habitats, introduction of unpalatable species and environmental pollution.

With regards to genetic dilution of indigenous breeds through cross breeding with incoming transhumant herds, it was noted that the identification and assessment of a number of predisposing risk factors highlighted in the findings of the survey including breed composition of arriving herds and herds at final destination, level of interactions, length of stay, breeding practice and frequency of cross breeding indicate that with regards to cattle, there is risk of genetic dilution through crossbreeding with transhumant mixed breeds though the risk could be considered as low risk as N'dama cattle is the predominant breed of herds at the final destination for all the 3 districts.

With regards to small ruminants, it was noted that taking into account the predominantly uncontrolled mating and free range system management system practiced coupled with relatively high proportion of mixed and Sahelian breeds in the composition of arriving flocks, the risk of genetic dilution through uncontrolled cross breeding between the local breeds and arriving mixed and Sahelian breeds in small ruminants is high. The level of the risk depends on the district involved, with Nianija having the highest level.

Dr Daffeh further reported that unregulated transhumance poses a real threat to endemic ruminant populations in The Gambia through the very high risk of introductions of Transboundary Animal Diseases (TADs). According to him the reintroduction of CBPP into the country in 2012, after 41 years of absence of the disease is a testimony to this.

In conclusion he reported that the beneficial effects of transhumance as it is practiced in the Gambia out weights its adverse effects as it is the foundation pillar upon which low input sustainable crop and livestock production is built. However there are major challenges confronting transhumance which needs to be addressed. These challenges include the unregulated nature of the practice, equitable and sustainable utilization of natural resources for both sustainable livestock and crop production and prevention and control of Transboundary Animal Diseases (TADs) such as Foot and Mouth Disease (FMD), Lumpy Skin Disease (LSD) and Contagious Bovine Pleuropneumonia (CBPP) and environmental degradation through over grazing, bush fires and deforestation.

Dr Daffeh presentation ended with the following recommendations from the study:

TO GOVERNMENT

7. To develop a National transhumance policy within the framework of existing and emerging national and regional initiatives in terms of building on best practice, policy coherence and policy harmonization
8. To collaborate closely with Senegal within the framework of a bilateral cooperation agreement between the Ministries in charge of livestock in the two countries. This will enhance harmonised regulations on the control of Transboundary Animal Diseases and the regulation cross border livestock movements geared towards improved management of cross border transhumance through measures such as issuance of vaccination certificates and movement permits or "laissez–passer sanitaire" and identification of vaccinated cattle guided by ECOWAS Protocol on Transhumance.
9. To formulate an appropriate national pasture policy within the overall framework of an updated more responsive National Livestock Policy
10. To Provide the necessary infrastructure to support transhumance which will include stock routes/ transhumance corridors, and watering facilities such as bore holes along the Riverine areas
11. To update disease control policy so as to reflect current and future needs in particular prevention and control of emerging and re-emerging Transboundary Animal Diseases
12. To develop a comprehensive national policy on Animal Genetic Resources which will include the protection of endemic ruminant livestock breeds

TO THE COMMUNITY AND DISTRICT AUTHORITIES

6. To update local conventions to reflect the need for enhanced community regulation of transhumance including provisions for an opening and closing dates for grazing, placing limits on cattle numbers for the access of grazing fields,
7. To conduct Community sensitizations on the local conventions on sustainable management of natural resource including control of bush fires
8. Sensitization of transhumant herders in their zones of origin prior to departure on need to avoid environmentally harmful practices such as cutting of trees branches for feeding livestock
9. To encourage dialogue with transhumant herders to foster better understanding and cooperation with community

TO THE DEPARTMENT OF LIVESTOCK SERVICES

9. To enhanced control of TADs
10. To provide affordable and accessible veterinary services at village level
11. To regulate and enhance livestock movement
12. To build the capacity of livestock farmers on improve livestock production systems, feed conservation, integrated pasture management and crop livestock integration
13. Close collaboration with the Department of Forestry and other stakeholders within the framework of multi sectoral approach to natural resources management

14. To conduct an inventory of range resources in the country
15. To establish community participatory epidemiosurveillance teams at major transhumance recipient zones throughout the country

- To comply with local conventions on sustainable management of natural resources including the requirement to base their herds in village farms.
- To ensure compliance with zoo sanitary regulation
-

Reactions from Participants

- It was noted that with the increase in livestock population reported in study sites coupled with number of incoming transhumance herds, habitats of Endemic Ruminant livestock are under threat as a result of transhumance. This manifest in competition for feed and water, introduction of diseases, destruction of orchards, saline intrusion into rice fields
- Community members call for the provision of grazing resources and stock routes
- Establishment of cross border livestock producer Associations to enhance coordination with Senegal
- It was noted that there is an establish regulatory framework in Senegal which needs to be under studied
- To consider the introduction of putting limits to the number of incoming transhumant herds as a means to control the overstocking of grazing lands in major transhumant recipient zones.
- It was noted the Nianija district has a peculiar problem in that majority of incoming small ruminants coming into are Sahelian breeds and this poses a serious threat for the endemic breeds
- The need to address some key constraint at source of transhumant herds like provision of watering facilities to reduce the numbers coming for transhumance
- It was noted that there is an increase in populations in parts of Niamina East due to migration of crop farmers to these areas for fertile farm lands attributable to transhumance.

CONCLUSIONS OF THE VALIDATION WORKSHOP

On The Economy

- It was concluded that sustainable transhumance is beneficial to host communities and to transhumant herders

On Policy

- The need for a clear national policy on transhumance was reiterated.
- The need for regulatory framework for such policy
- The need for involvement of Livestock Owners Associations in such policy formulation and implementation

On the Environment

- Deforestation due to cutting down trees, bush fires and overgrazing were all closed linked with transhumance.

Recommendations of the Validation Workshop

- Sensitization on control of bushfires, on the cutting down of tree branches
- Putting in place a regulatory framework on the number of incoming herds accessing grazing fields
- Conduct a national range resource inventory
- Provision of watering points, stock routes and deferred grazing areas
- Land use planning monitoring and inspection
- Formation of Sanitary Defense Committees for Community Participatory Epidemio Surveillance Network at major transhumant hobs

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LIST OF PARTICIPANTS FOR THE NATIONAL TRANSHUMANCE WORKSHOP HELD AT JINOI ON THE 9TH DECEMBER 2014

NO.	NAME	DESIGNATION	INSTITUTION	SIGNATURE
1	Fatou AA Cham	Environmentalist		
2	Alhagie Omar [illegible]	Chief Livestock	Kuntaur	
3	Lamin Saine	DDG	DLS	
4	Hamung Fadera	Kanesa/Senise	Police	
5	Alasana Dibbasy	Niamina East	Police Chief's Secretary	
6	Sarja Ceesay	Environment Inspector	NEA	
7	Fafanding K. Kuta	Immigration	NEA	
8	Momodou Jarju	Mariama Kunda	Tourism Development	
9	Seja Kuyateh	Site Coordinator	Professor	
10	Mamud Njie	Site Coordinator	PROGEBE	
11	Ousman F. Sabo	Officer in Charge	DLS CRR South	
12	Ebou Jobe	"	DLS-CRR/N	
13	Lamin Marong	Livestock Technician	Progebe	
14	Osman Sanyang	LAO	DLS	
15	Kabuteh Bamso	Njau	Upper Police	

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3	Lamin Saine	DDG	DLS	
4	Hamung Fadera	Kerewan/Senior	Police	
5	Alasana Dibbasey	Niamina East	Police Chief's secretary	
6	Sarja Ceesay	Environment Inspector	NEA	
7	Fafanding K. Kuyateh	Journalist	NEA	
8	Mamadou Janjo	Madina Kunda	Today Newspaper	
9	Saja Kuyateh	Ste Coordinator	Professor	
10	Mamud Njie	Site Coordinator	PROGEBE	
11	Ousman F. Sabo	Officer in Charge	DLS CRR South	
12	Ebou Jobe	"	DLS-CRR/N	
13	Lamin Marong	Livestock Technician	Progebe	
14	Osman Sabyang	RLO	DLS	
15	Kabuteh Bamso	Njau	Upper Police	

ANNEX IV ***SURVEY TEAM MEMBERS***	
Name	***District***
Lamin Marong	***King West***
Madou Kolley	***Kiang west***
Lamin Sanneh	***Kiang West***
Fatoumata Cham	***Nianija***
Yassin York	***Nianija***
Madou Bamba Gaye	***Nianija***
Masanneh Sanyang	***Niamina East***
Modou Gaye	***Niamina East***
ABLY Jallow	***Niamina East***

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