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HERDER-FARMER CONFLICTS AMIDST COVID-19 PANDEMIC IN WEST-AFRICA

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ABSTRACT

In West Africa, transhumance has been a major system of cattle production in which herders travel with their herds in search of adequate pasture and water. Unfortunately, the perennial conflicts between the transhumant herders and crop farmers have had negative effects on agricultural production. The objective of this review was to document among others such negative impacts and how COVID-19 has influenced transhumance activities in West Africa. The review was carried out using published articles on the subject from journals, books, online sources and semi-formal interaction from key stakeholders. Climate change, diversification of land use, land tenure systems, perceptions about pastoralists, porous entry points, absence of grazing corridors and failure to adhere to the conditions of the ECOWAS protocol on transhumance were some of the major causes of herder-farmer conflicts. Destruction of crops and animals, loss of human life, rural-urban migration, poor living conditions and destruction of homes are some of the major impacts of the herder-farmer conflicts in West Africa. Public education on transhumance, government intervention and the ability to monitor and adhere to the ECOWAS protocols on transhumance by all countries in the region would help minimize these conflicts. Furthermore, all stakeholders should play their roles and help find innovative and sustainable ways of feeding transhumant cattle in West Africa.

Keywords: Cattle, Climate change, ECOWAS, Land use, Migration, Transhumance.

INTRODUCTION

Globally, the COVID-19 pandemic has been considered as one of the fast-spreading pandemics which spread throughout the world in the space of 3 months. It originated from Wuhan City, Hubei Province of China (Lone and Ahmad, 2020). Close physical contact facilitates the rapid spread of COVID-19. High population density greatly increases the frequency of contact, and urban settings are generally more vulnerable than rural areas (Bisson and Hambleton, 2020). In this era, majority of the world's population has been forced to drastically change their ways of living, due to movement restrictions and

stay-home instructions in many countries (Simunek et al., 2021). These restrictions have had adverse effects on agriculture, which for many decades has been the backbone of most economies in West Africa supporting livelihoods by employing 60% of the active labour force and contributing 35% to gross domestic product (GDP) (Nelson et al., 2013). Livestock herding contributes up to 10–15% of GDP in Burkina Faso, Chad, Mali, and Niger, and an even larger share in Mauritania, where 50% of the population are pastoralists (USAID, 2017). Livestock provide meat and other animal products, utilize household waste, serves as a source of social-

cultural functions and contributes significantly to farm income in almost all the agro-ecological zones (FAO, 2009).

In West Africa, transhumance is a common livestock production system. Transhumance refers to movement of herds to new locations to exploit seasonal availability of pastures. In the process, pastoralists move with their herds from areas with feed and water scarcity such as the Sahelian zones to areas where feed and water are found, often in the sub-humid zones (Zougmore *et al.*, 2016). Transhumant pastoralism supplies 70-90% of cattle in the Sahel region and cattle herding is basically part of living in the Sahel because they serve as employment, provide meat and milk, serves as a source of credit, savings, and dowry payments (USAID, 2017). Due to its importance to agricultural production and food security, members of the Economic Community of West African States (ECOWAS) have formulated and adapted a protocol to be observed by countries in the region (ECOWAS, 1998). The purpose of the protocol is to motivate governments in coastal countries to make pasture and water available to ruminant livestock all year round and legitimize cross-border grazing by herds-men. Contrary to the dictates of the protocol, these movements are more often than not uncontrolled and their animals trample on unauthorized land causing conflicts between the herder and the crop farmer because some governments in the coastal countries have not put in place appropriate infrastructure to ensure that pasturelands remain reserved for grazing. Consequently, lands meant for grazing have been used for crop farming, building of houses and recreational centres causing a significant shrinkage in grazing lands (Ewepu, 2016) and causing the struggle over grazing lands and conflicts between herders and crop farmers. Every year, several herder-farmer conflicts are reported in West Africa resulting in loss of lives, animals and property. Despite the negative impacts of herder-farmer conflicts and transhumant cattle production in West Africa, a lot still remains unknown as regards documentation of its impacts on livelihoods of people. This review seeks to fill in this void whilst indicating the impact of COVID-19 on transhumant cattle production in West Africa and proposing

measures to help ameliorate them. Information for this review was obtained from published articles in journals, online sources and semi-formal interaction with key stakeholders.

Transhumance in West Africa

West Africa shows a large variety of Agro-ecological zones from the desert in the northern parts to humid regions in the southern part (Lee *et al.*, 2013) and these have a significant impact on forage and livestock production. The arid zone and hyper arid zone include the northern parts of Senegal, parts of Mali, Burkina Faso and Cameroon. These areas have 100mm-400mm of rainfall annually and dry season that extend to several years causing severe drought (Zougmore *et al.*, 2016). The semi-arid zone, consist of the southern parts of Senegal, Gambia, Mali, Niger, Chad and upper parts of Guinea Bissau, Togo, Benin, Nigeria, Cameroon and the Central African Republic (FAO, 2016; Zougmore *et al.*, 2016). This zone has an annual rainfall of 400mm-600mm, followed by long dry season. Drought, flood and bushfires are prominent in this zone (FAO, 2016; Zougmore *et al.*, 2016). These higher temperatures result in reduced feed intake and lead to energy deficits and decreased milk production, fertility, fitness, and longevity, while drought can reduce calving rates from the normal 60–70% to 25–30% (USAID, 2017). The sub-humid and humid regions experience a high amount of rainfall annually and a shorter dry period. The annual rainfall in this region is between 600mm and 1500mm (FAO, 2016). The region is prone to floods, bush fires and vector borne diseases e.g., ticks and trypanosomiasis. The sub-humid zones include Guinea Bissau, upper Guinea, south most part of Mali, northern part of Ghana, Côte d'Ivoire, Sierra Leone, Benin and central parts of Nigeria while the humid zones are the southeast of Guinea, northern Liberia, parts of La Côte d'Ivoire, middle Ghana, the middle belt of Nigeria and southern Cameroon (FAO, 2016; Zougmore *et al.*, 2016).

In West Africa, transhumance mostly occurs between the northern and southern parts which is termed as an old-age phenomenon where movement is towards the south mainly to escape diseases like trypanosomiasis and onchocerciasis and also to seek new pasture lands (SWAC-

OECD/ECOWAS, 2007; FAO, 2012). In Cameroon, transhumance is an established practice among cattle herders to overcome the constraints of the dry season which usually extends September/October through to April/May of the following year (Motta et al, 2018). During this period, a large proportion of cattle herds from the main livestock production areas of the country migrate as a coping mechanism to the ecological and environmental constraints (Motta et al., 2018). Transhumance helps to preserve and increase the production of livestock, make good use of pastoral lands and sustains the livestock from the Sahel regions (FAO, 2012; Bouslikhane, 2015). This leads to more milk production and improved reproductive performance, reduction in herd mortality, low production cost and opportunities to build social relationships with host countries (Zougmore et al., 2016). This form of livestock production thus contributes greatly to food self-sufficiency.

A major constraint to ruminant livestock production is seasonal fluctuation in forage availability and quality due to modal rainfall patterns (Adjorlolo et al., 2014). Furthermore, changes in temperature, the occurrence of droughts and floods also negatively affect livestock productivity (USAID, 2017). Sustainable animal production depends on the availability and accessibility of certain resources such as feed and water especially in systems where animals depend largely on forages for their nutrition. Forages are an economical source of nutrients for animal production and also help with soil and water conservation (Chaudhry, 2008). The production of quality forage has a direct impact on livestock performance and emphasizes the need to understand the factors that lead to increase in yield and quality of forage to optimize productivity. Understanding what affects forage yield and quality for specific plants allow producers to better select forage species that can complement each other to improve animal production. In semi-arid mixed grasslands, the major forage types used in ruminant production are legumes and grasses (Zhang et al., 2017). Quantity and quality of feed will be affected mainly by an increase in atmospheric carbon dioxide levels and temperature. The effects of climate change on the quantity and quality of feeds depend on location, livestock production system, and live-

stock species. Furthermore, an increase of 2°C will have negative impacts on pasture and livestock production in arid and semiarid regions and positively impact humid temperate regions (Harrigan et al, 2017). The length of a growing season is also an important factor for forage quality and quantity because it determines the duration and periods of available forage (Rojas-Downing et al., 2017). In addition, various changes in rainfall distribution strongly influence how animals react and adapt to certain conditions, as well as the interactions between a parasite and the host animal. Body conditions of ruminants fluctuate seasonally in response to changes in energy requirements, resource availability and forage-intake patterns. The seasonal variations may further alter the ruminant body conditions in response to any parasite infection (Getz et al., 2013). Hence consistent movement of cattle in search of quality feed is paramount.

Transhumance amidst COVID-19 Era

In West Africa, thousands of men and animals travel through transhumance corridors in a pilgrimage throughout the year. However, due to border closures decreed by Governments to limit the spread of COVID-19 globally, herders and cattle who took to the corridor between Mauritania and Mali during the lean season are now stranded in border areas without resources to feed their livestock (International Organisation for Migration, 2021). On the other hand, pastoral communities were already facing many challenges long before the COVID-19 outbreak. For instance, the 2019-2020 pastoral season was marred by Nigeria and Mali's closure of borders and with Benin also putting a ban on cross-border transhumance which took effect in December 2019. Most countries have already reached the warning threshold except for Chad, Guinea and Togo. In the COVID-19 era, transhumance within the same country has also been disrupted due to quarantine and curfew measures (Food Crisis Prevention Network, 2021). Countries have enacted a mix of social distancing and movement restriction measures to minimize the spread of COVID-19. Other measures include suspension of international flights, closed borders, curfews, lock down and many others (Table 1).

Table 1. COVID-19 Measures in Some West African Countries

Country	Lockdown	Movement Restrictions
Mali 901 cases 53 deaths	NO Curfew (lifted)	YES International flight suspension, Border closure, Curfews (lifted)
Niger 914 cases 55 deaths	NO Partial lockdown (phase out)	YES International flight suspension, Border closure, Curfews (phase out)
Guinea 2863 cases 18 deaths	NO	YES International flight suspension, Curfews, Domestic travel restrictions
Senegal 2617 cases 30 deaths	NO	YES International flights suspension, Domestic travel restrictions, Visa restrictions, Border closure, Checkpoints within the country, Surveillance and monitoring
Benin 130 cases 2 deaths	NO	YES Surveillance and Monitoring, Border closure, Visa restrictions, Domestic travel restrictions (phase out)

(Bisson and Hambleton, 2020)

Importance of transhumance

Livestock farming plays an integral role in many West African countries providing livelihoods for millions of families, as a source of income, a means of resilience and cultural value. According to Rosegrant (2010), livestock provides nutrient and traction for smallholder systems. Animal traction refers to the use of domestic and partly domesticated animals for the purposes of tillage and transport. Worldwide, animal traction is an important reason for keeping livestock, particularly in poor rural societies, because it is a cost-effective technology for small scale and poor subsistence farmers compared to other forms of mechanization and the use of human power. It is envisaged that these trends will continue in the near future as it is expected that agricultural intensification will rise due to increased population pressure and access to markets (Francis *et al.*, 2015). Herders graze their animals on farmlands that belong to crop farmers while animal dung helps in improving soil fertility as it contains nutrients such as nitrogen, potassium and phosphorous (Gupta *et al.*, 2016). The cattle sector also helps address micronutrient deficiencies in plants including iron, zinc and vitamins A and B12 (Rosegrant, 2010). Pas-

toralists also require residues produced by crop farmers to feed their livestock, and the crop farmers often require the protein and dairy products produced by animals owned by pastoralists (Dimelu *et al.*, 2016). Cattle production helps to generate income and improves livelihood in various ways. Through all this process, middlemen are assigned to facilitate the transactions and hence becoming a source of income to people in various ways and furthermore contributing to total national revenue through taxes (Timpong-Jones, Personal communication, 2017). They are also used as a measure of social status in most communities (Moyo *et al.*, 2010) in West Africa.

ECOWAS Protocol on Transhumance

The Economic Community of West African States (ECOWAS) is an organization formed purposely for economic integration. ECOWAS aim is to promote co-operation and development in terms of social, economic and cultural activities to improve the livelihood of people. ECOWAS recognizes transhumance as a mode of livestock production to attain self-sufficiency in food production, food security, economic and political stability in the region. The ECOWAS Protocol "Relating to the Regulation on Transhumance between ECOWAS Member States

1998 and the ECOWAS Regulation on Transhumance between ECOWAS Member States 2003” seeks to regulate transhumance by ensuring that herd movements are regulated and take place along defined corridors allowed by member states. ECOWAS has also developed Strategic Action Plan for Livestock in West Africa to develop and transform the sector. The Food and Agriculture Organization (FAO) of the United Nations has also developed an Action Plan for Transhumance Livestock Breeding in West Africa. The interventions if properly implemented should reduce conflicts significantly between farmers and pastoralists (Tukur, 2013). The ten-

ants of the ECOWAS protocol on transhumance have given member states the full right to graze on land that has pasture upon fulfilling the conditions of the protocol, so it is not surprising to see a Burkinabe, Malian or a Nigerien pastoralist grazing his sheep, cow or goat in Nigeria or from any other neighbouring countries. The objective of the protocol is to allow animals of the bovine, caprine, cameline, equine plus asinine species free passage across the borders of all Member States as stated in Article 3. The relevant articles governing the movement of herds across borders under the ECOWAS protocol on Transhumance is as shown in Table 2.

Table 2: Relevant Articles of the ECOWAS Protocol on Transhumance

Article	Condition
5	All transhumance livestock shall be allowed free passage across points of entry into and departure from each country on the condition that they have been given the International Transhumance Certificate
6	The International Transhumance Certificate should be verified and signed by competent authorities at the entry and exist point of the host country
7	Transhumant herders should move with their herds along routes defined by Member States
8	Crossing of borders should be done during the day and should not take place in the night
9	Herds not covered by the International Transhumance Certificate will be placed under quarantine and the cost borne by the owner
10	Transhumant herders and their cattle must be guarded whiles on the move and whiles grazing
11	A minimum of fifty cattle should be herded by one herdsman and migration should be done with the help of herdsmen
12	A minimum of fifty cattle should be herded by one herdsman and migration should be done with the help of herdsmen

(ECOWAS, 1998)

According to the dictates of the transhumance protocol, on arrival each host country should make sure that the transhumant herder is informed about the duration of his stay so that they do not exceed the allocated time of stay. Each country shall define the areas where transhumant animals may be stocked and shall determine the maximum capacity of each identified zone. The accompanying herdsman must pen up his herd in the zone of which he is directed to by officials, at point of entry. Protection will be given to herdsmen who are legally admitted into the host country by authorities and their fundamental rights shall be guaranteed by the judicial institution of the host countries. Any disputes between farmers and nomadic herdsmen shall first be judged by an arbitration commission based on information gathered by the said commission. But if disputes are not resolved, they shall be taken to the law court. The commission will comprise of representatives of herdsmen, farmers, livestock officers, agricultural officers, officials from the Ministries of Forest and Water Resources and local political and administrative authorities (ECOWAS, 1998).

Lessons learnt in the implementation of ECOWAS Protocol on Transhumance

Organization of information, communication, enlightenment, training and education campaigns and programs directed at transhumant herdsmen and the different actors involved in transhumance departure, transit and host zone of transhumant herds will help in the implementation of policies to help facilitate easy movement. Establishment and/or re-energizing of pastoral organizations at the national level, and especial-

ly, of breeders' associations, in order to encourage them to contribute to the improvement management of transhumance with the prevention and management of transhumance related conflicts. Furthermore, strict compliance, by countries, transhumant farmers and other stakeholders with the transhumance regulations and the provisions of the ECOWAS Protocols (Acting for Life, 2017) should be encouraged. There is the need to create/revive grazing reserves and maintain transhumance routes required for easy movement, rebuild the system of nomadic education and education in general in rural areas and regulate the allocation of land to farmers and pastoralist in the region (ECOWAS, 1998; Higazi and Yousuf, 2016). Relatively, livestock owners also have the responsibility of making sure they go through the right procedures to get certificates and permits to cross borders. The judiciary or legal system must accord pastoralism as an act that can confer landownership rather than viewing pastoralism as more of a privilege to use natural resources, easement or a right of way only (Tukur, 2013). Adherence to the protocol is the key to harmonious living between the herder and the farmer but stakeholders and people at various levels have turned a blind eye to the existence of the protocol (FAO, 2012).

The protocol enhances trade among member countries, improves foreign exchange rate and facilitates cultural diversification. Non-adherence to the protocol has resulted in conflicts, loss of lives and destruction of farms, killing of animals and bush burning (Baidoo, 2014). These are as a result of poor implementation of government policies, inequitable allocation of diminishing rural resources, lack of title lands on the part of pastoralists which is often exploited by traditional authorities supporting farmers, political unwillingness, cultivating crops on pastureland due to high fertility from animal droppings, inability of transhumant to adapt to climatic effects and response to the demand for livestock (Alidou, 2016). The main constraint is lack of livestock feed due to deteriorated natural pastures, bush fires and pressure from crop farmers and poor private sector investments in feedlots and ranching (FAO, 2012). National Governments are in the position to help implement the protocol by incorporating a better inte-

gration of cross-borders transhumance in development policies (Alidou, 2016). The government of Nigeria has also passed a law that allows herdsmen to move across their borders fully and that created awareness of the protocol (Ewepu, 2016).

Causes of Herder-Farmer Conflicts

According to literature a number of factors are responsible for herder- crop farmer conflicts in West Africa. An important factor that influences resource availability for agricultural and pastoral production is climate change. Although it is a global phenomenon, the Sahel region of Africa has been particularly volatile over the past few decades. This has brought about shrinkage of environmental space and an increase in natural resource scarcity (Asaah *et al.*, 2017). Fulani herders traditionally migrate with their cattle southwards during the post-harvest period to feed on crop residues. Environmental pressure and growing competition for natural resources drive the herders and their cattle to areas where the cattle destroy crops. Therefore, there is a need for grazing movements which avoid crop farms to enable cattle access pasture resources to ensure food security (Rojas-Downing *et al.*, 2017). Secondly, these conflicts arise due to the struggle over land and precipitated by a number of factors such as chieftaincy disputes, changing demographic conditions of agricultural and pastoral encroachment, availability of natural resources and land allocation. Conflicts over land usually occur where first groups feel their basic rights to land ownership and/or utilization have been denied them in favour of other groups (Baidoo, 2014). On the other hand, grazers argue that there is competition over land and that both the human and cattle population had increased leading to a demand for new space both for farms and pasture. The result is that farmers encroach onto grazing lands with some moving into grazing communities to farm around grazers' homes (Anchang *et al.*, 2016). For instance, the migration of the "Fulbes" to the South due to drought in some countries like Mali and Nigeria resulted in herder-farmer conflicts (Bukari and Schareika, 2015).

There has also been an increase in these conflicts because many of those who have been retired from service can no longer afford to live

in the urban areas. They return to the rural areas and embark on agriculture thus increasing the demand for farmland (Nformi *et al.*, 2014). Thirdly, the destruction of farms and farm produce normally occurs when Fulani herdsmen send their cattle to graze during the day or at night. The animals sometimes stray without the knowledge of the herdsmen into farms and on other occasions the herdsmen intentionally send the animals to farms to graze. The destruction of farms normally occurs at night when Fulani herdsmen send their cattle to graze. Their inability to control the movement of the herds at night coupled with the number of cattle under the care of one or two herdsmen makes the destruction of farms inevitable (Baidoo, 2014). In recent times, these conflicts have escalated, taking another dimension of ethnic and religious differences with little effort from government or community leaders aimed at addressing them (Abdurrahman *et al.*, 2015). In addition, the perception and hasty generalization of people about transhumance escalated the conflicts (Sonde, Personal conversation, 2018). The way the Fulani perceive the Hausa and vice versa is believed to affect relationships between the two ethnic groups. For example, the Fulani were known to see the Hausa as Kado (meaning infidels or unbelievers) whose property they can use without offence to God. The Hausa, on the other hand, perceive the Fulani as intruders, uncivilized and uninformed. This leads to violence at the least provocation.

Effects of Herder-Farmer Conflicts

In the first place, cattle are expensive because the unit cost per animal is very high. During such conflicts, while farmers, villagers and cattle are killed, large markets can also be attacked leading to loss of produce (Pugliese, 2014). For example, several incidents have occurred in at least 22 out of 36 states in Nigeria, with alarming rates of increasing unrests in the country spreading throughout the central and southern states. In 2016, over 2,000 people were killed and tens of thousands displaced in Benue and Kaduna states alone (International Crisis Group, 2017). According to another report, incidents involving herders accounted for 44% of all fatalities in the country in 2016 (International Crisis Group, 2017). Konkomba farmers carried out a

night raid in Damdaboli, Zamashigu, Batiga, and Naboya farming communities in the Gushiegu district of northern Ghana in 2011. Thirteen Fulani pastoralists were killed, their houses burned, and their cattle rustled as a result of the raid (Francis *et al.*, 2015). They were rendered homeless and had to be accommodated at the district headquarters for more than 3 months (Francis *et al.*, 2015).

Furthermore, these conflicts in agrarian communities resulted in rotting of crops in barns and other storage places, lack of proper care of crops in the field, abandonment of crop in the farm, absence of agricultural labour force, and late planting (Opoku, 2015). This leads to losses along production process, ranging from production, harvesting, preservation and marketing. These conflicts create an atmosphere of uncertainty, insecurity, breakdown of economic activities and migration of people to safer places. Farmers compromise many production activities resulting in low yield, poor economic return and loss of planting materials. For instance, in a case study in the Agogo Traditional area of Ghana, people abandoned their farms due to insecurity arising from the conflict. This has several effects on short and long-term production, which usually leads to food insecurity. This discourages the farmers and rural/agricultural development (Opoku, 2015; Isife and Ofuoku, 2009). Lastly, Herder-Farmer conflict inhibits effective grazing of ruminant livestock; this results in the emaciating of cattle leading to poor growth, market weight, milk production and yield. Also, emaciated ruminant livestock cannot be sold for a good price.

DISCUSSION

Transhumance is a popular ruminant production system in West Africa and depends on grazing to feed the animals. Rearing these animals are important because they do not only provide food for humans but can be used for work, pay for dowry and provide manure to improve the fertility of croplands. Unfortunately, grazing lands are diminishing as the years go by with no alternative approach to sustain the sector. Decades ago, the Sahelian regions adopted a way of life to move animals across countries to coastal areas to help feed and nourish them since their environment did not support crop farming

or production of pasture but now even the coastal areas are not providing enough pastures for grazing. Although coastal countries, have vast grazing lands and their rainfall patterns support pasture growth, now these lands are being used for non-agricultural activities such as real estate development, recreational centres or parks, shopping malls and many more. Lands that are meant for making pasture or growing crops have been leased or sold to real estate developers and foreign investors. As a result, lands in the coastal regions have become scarce and the little available lands are being used by subsistence farmers who only grow crops to feed themselves and their families.

To complicate matters, the COVID-19 pandemic has affected livelihoods across the globe including borders being closed, lockdown implementation and deaths of humans and animals.

CONCLUSIONS AND RECOMMENDATIONS

Movement of transhumant cattle from the Sahel region to the coastal countries of West Africa has for many years been an integral part of animal agriculture. Over the last 3 decades, there has been many conflicts between the herders and crop farmers due to scarce resource availability, non-adherence to the ECOWAS protocol on transhumance and poor sub-regional collaboration. The COVID-19 pandemic has and is likely to aggravate these challenges. Transhumance for decades have been the way of life of herders in West Africa and this way of life has resulted in conflicts between herders and crop farmers which has put a strain on agricultural production and food security. There is little adherence to the ECOWAS protocol on transhumance, no grazing reserves, porous entry points, no demarcated corridors, lack of regulations on land use and closure of borders due to COVID-19 pandemic and these fuels herder-farmer conflicts. The conflict has led to both losses of livestock and crop farms as well as human lives and poor production across the region. These losses have led to food shortage leading to food insecurity in conflict prone areas. Furthermore, uncontrolled bush fires leading to the loss of farms and houses is also an impact of the still existing conflicts which has left people homeless and jobless. Due to these, the levels of unemployment are still on

the rise among the literate and illiterate with negative effects on government revenue. To ensure sustainable transhumance system in West Africa, countries should work together and support full implementation of the ECOWAS protocol on transhumance and responsibilities of all stakeholders well agreed upon.

Based on this review it is suggested that:

- i) ECOWAS should review its protocol on transhumance and amend it to suit the restrictions of COVID-19 to improve on its adoption and implementation across the region.
- ii) National Governments should support implementation of the ECOWAS protocol on transhumance by putting in place ranching systems particularly in the coastal countries to ensure availability of feed and water for transhumant cattle throughout the year.
- iii) All coastal countries should create, monitor and manage transhumant entry points and grazing corridors for trekking cattle.
- iv) Stakeholders including cattle farmers should help educate transhumant herders on their responsibilities and be encouraged to adhere to them. The cattle farmers association should help national governments in this education process.
- v) Countries should regulate influx of herders by having an effective regulation and monitoring system to ensure that the number of animals coming into any country is commensurate with the carrying capacity or available fodder and water resources.
- vi) The Agricultural Extension services and relevant stakeholders should sensitize crop farmers on the complementary role of transhumant livestock in agricultural production, human nutritional security and securing livelihoods in West Africa.
- vii) Governments in particular the Coastal countries should be educated and encouraged to go into fodder and feedlot production to ensure sufficient cattle feed at all times.

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