ORIGINAL RESEARCH PAPER

Volume-8 | Issue-5 | May-2019 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

# ANALYSIS OF THE REGULATORY ENVIRONMENT INFLUENCING SUSTAINABILITY OF LIVESTOCK FOOD SYSTEM IN ISIOLO COUNTY, KENYA

Social Science

**Steve N. Machan**

**Jones Agwata*** *Corresponding Author

**Nicholas Oguge**

## ABSTRACT

Analysis of the livestock food systems sustainability requires understanding of internal and external drivers and processes that influences productivity and the value chain outcomes. The regulatory environment includes the institutions, policies and legislations that govern the food system. Our study analyzed value chain institutions and other frameworks that influence the sustainability of livestock food system in Isiolo County, Kenya. Specifically, we examined the technological transformations in the value chains, actors and their control mechanisms and responses to pressures with a view to develop options for sustainability. We established that there is lack of effective policies and regulations to enhance regional and international trade in livestock and livestock products value chains. Weak institutional coordination of value chain actors and poor policy implementation modalities for livestock sub-sector are threat to the sustenance of these systems. Uncoordinated Cross-border trade linkages among the neighbouring counties and regions (e.g. Ethiopia and Somalia) exacerbate trade and resource use conflicts. However, the County has the potential for domestic, regional and international trade in livestock and livestock by-products that would benefit from effective regulatory frameworks.

## KEYWORDS

Food system, Value chain actors, Policies, Regulatory framework, Environmental Sustainability

## I. INTRODUCTION

The world food prices crisis of 2007/2008 and 2010 generated increased interest in the analysis of food system by many policy makers of similar interests (McGinnis, 2014; Ericksen, 2008). The studies were mainly geared towards scientific approaches to reduce food insecurity, environmental degradation and poverty levels among the rural populations living in dry lands of the world. The analysis indicated that persistent food insecurity, increasing environmental degradations and poverty levels in the drylands of Sub-Saharan Africa were "food system crisis" (McGinnis, 2014; Rastoin &Ghersi, 2010). These therefore called for the development of new governance for food systems to address national, regional and global challenges in sustainability. A crucial challenge today towards sustainability of food systems in the developing countries is the management of the dynamics of policies and legislative systems originating from both regional and global levels. These are geared towards occasionally changing food preferences, quality and safety demands among the various categories of value chain actors. Hence, sustainability considerations are addressed when development activities incorporate ways to deal with negative environmental impacts. These therefore require broader levels of engagement frameworks.

Globally, livestock and livestock products trade requirements are governed by WTO-TBT Agreement (for technical regulations, standards & conformity assessment procedures) and WTO-SPS Agreement for sanitary and phytosanitary requirements i.e. health and safety requirements. The regulations stipulate that the member countries have the pre-requisite mandate to comply with international standards (OIE, CAC) for livestock and livestock products with known animal health status (Animal identification and traceability), minimal contamination and low preference of trade sensitive and zoonotic diseases proven by effective and consistent residue monitoring and control plan (WTO, 2016).

In Isiolo County, there is potential for regional and global trade in livestock and livestock based products but the sustenance is threatened with fragile ecological conditions and weak regulatory frameworks to enhance productive value chains. Our study also investigated pastoral production systems and modern technological practices presently adopted in livestock food system that may impact positively or negatively on natural resources for constant supply of livestock products and byproducts such as meat, milk and hides and skins respectively. The concern is the nexus of the socio-cultural values and the sustenance for the global requirements in quality and standardization of livestock and livestock by-products for export trade.

## II. MATERIALS AND METHODS

### *A. The study area*

The study was carried out in Isiolo County, Kenya with an estimated area of 25,570km$^2$, with an estimated population of 191,628 persons by the year 2020 (KNBS, 2016). The population density is currently estimated at 4 persons per km$^2$ while the annual growth rate is 3.7 per cent. However, there are high poverty and illiteracy levels in the County standing at 77% and 85% respectively. The rainfall pattern is bimodal characterized by long rains from March to May (MAM) and short rains from October to December (OND). Generally the rainfall is highly unreliable and unevenly distributed. Most parts of the area receive 150-300 mm during normal seasons while the highest is 650 mm around Isiolo central. About 95 per cent of the County is classified as arid (Agro ecological zone V) or very arid (Agro ecological zone VI) while only 5 per cent is semi-arid thereby making the area favourable for livestock than crop agriculture. The temperatures are high throughout the year ranging from 27°C - 30°C in almost all the parts of the County. This coupled with rainfall unreliability exclude economic production of mainly annual food crops for pastoral livelihoods. Hence, livestock keeping is considered the main source of livelihood for the citizens of Isiolo County who are mainly pastoralists with very few ago-pastoralists. The main sources for production of livestock and livestock products are Garbatulla, Merti and Isiolo Central sub-counties. These also form the three administrative units of Isiolo County and the study area for our survey.

### *B. The study design*

The study adopted field survey using cluster and area sampling technique. In this design the County was divided into three non-overlapping geographical units which were referred to as clusters and these included Isiolo central, Garbatulla and Merti sub-counties respectively. Field data was obtained using mixed method approach in order to achieve appropriate results for the analysis in institutional and regulatory frameworks for sustenance of livestock food system in Isiolo County. The main research objectives of our study included to analyse the institutional arrangements of existing value chains and regulatory frameworks governing the livestock and livestock products affecting sustainable trade of the potential value chains. The types of data required for our study were based on perceptions of household survey, focus group discussions and key informant interviews from public and private institutions in Isiolo County, Kenya.

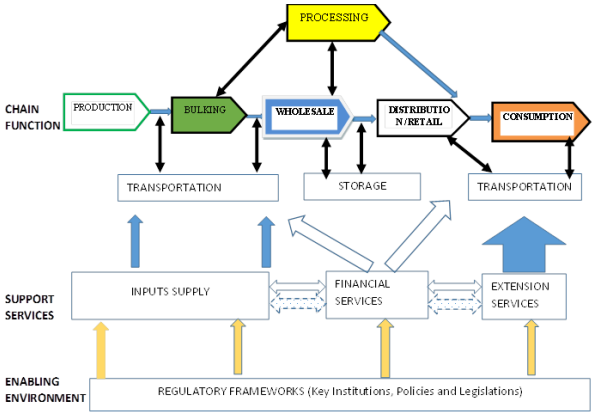
### *C. Methods of data collection and analysis*

The data collection method used was targeted to achieve the specific objectives of the study. These included the review of the existing documents such as livestock policies, departmental strategic plans, published research articles (e.g. journals and periodicals) and different levels of value chain actors' interviews. The value chain actors' interviewed included the pastoral and agropatoral farmers, public and private sectors. The interviews which included open and closed ended questionnaires covered all the relevant value chain actors which included the micro actors (e.g. producers, traders, processors,

distributors and consumers), the support service providers (the input suppliers, financial institutions and extension services providers) and those involved in creating an enabling environment for the sustainability of livestock food system in Isiolo County such as the policy and existing legislations regulators. The closed ended questionnaires were used for randomly selected households in the study area while the open ended questionnaires were used for collecting information from the County government livestock activities related departments, the National Government ministries (e.g. livestock, water and environment) officials in the County, international development agencies and local livestock based group organizations involved in the development of livestock subsector. We also used field observations as instrument for data collection to help researcher's triangulations for comparing the respondents' information and actual situation on the ground. Our study also analyzed the categories of markets with their specifications for local, regional and international trade requirements in livestock and livestock products trade. The local or domestic market takes care of the intra and inter-County trade as well as the national level while the regional market is based on the Regional Economic Communities (REC) agreements such as the COMESA, IGAD and EAC. The International market requirements analyzed included European Union (EU), United States of America (USA) and the Middle East markets. The results of the analysis were presented in narrative and tables respectively. Cross tabulations was also done to find out the associations between key actors, support services and enabling environment that influence livestock food system in the County.

## *III. RESULTS AND DISCUSSIONS*

### *A. Figure 1: A schematic presentation of a typical livestock value chain in Isiolo County*




### *B. Key actors of the potential livestock value chains*

#### *(I) Production*

The primary production of livestock value chain in Isiolo County is dominated by nomadic pastoralists (85%), agro-pastoralists (10%) and ranchers (5%). Despite the large cattle population (264,000) in the County, the livestock off take is low due to inconsistent supply of live and quality animals to market or bulking centres. Over 85% of livestock traded in the County is acquired from neighbouring Counties. Less than 15% of the animals are retained in the County for domestic consumption. These are also mainly poor quality animals that failed to meet the requirements of the medium and large traders for export trade.

#### *(ii) Bulking*

Majority of trade or exchange of stock takes place at the interior (i.e. rural areas) among the pastoralists and itinerant small scale traders. This is where the first bulking starts (primary markets) with support of middlemen mainly referred to as "brokers". At this stage there is also wide exchange of stock (selling and buying) and reselling among the micro-traders. There is sometimes no sequence in trade but there is a lot of crisscrossing (informal trade pattern) where the pastoralists and agro-pastoralists can sell their products to brokers directly or to small scale traders (e.g. local butchers and retailers) and even medium and large scale traders such as wholesalers in some instances. This phenomenon happens when pastoralists and agro-pastoralists buy stock for breeding purposes from wholesalers such as ranchers. However, the bulked stock from the interior for trade purposes are then transported by trucks (45.4 %), trekking or hooves (40.2 %) and to a lesser extent by motorbikes (14.4%) to secondary markets for large and small ruminants (Oldonyiro, Kipsing, Isiolo central, Eskot) or only small ruminants (Merti market).

The secondary markets are dominated by external traders who are involved in wholesale, retail and export trade. Some of these large scale traders also run meat factories or regional butcheries and retailing in various parts of the Country. At the secondary markets also there is grading and selection for live animals as per the demands of intended market. For instance, cattle required for export trade within or outside the County should be between three-four years of age which have attained 250kg-300kg body weight for USD 350 to USD 400 respectively. However, all female adults considered as culls are sold between USD 230 to USD 270 depending on body condition.

#### (iii ) Processing

Over 85% processing of beef and small ruminants meat and milk products are conducted by community owned slaughter houses/slabs and milk processing plants for the cases of meat animals and dairy animals respectively. The current Isiolo export abattoir is not yet complete since the start of the mega project during the 2007 Economic Stimulus Programme (ESP). Hence, currently there is limited processing due to lack of modern slaughter slab although there are 9 local slaughter slabs in operation (Isiolo central, Garbatulla and Merti sub-counties respectively). Out of these only two (Isiolo central and Merti) slaughter large stock such as cattle and camels while the rest are specializing only on smallstock trade. However, majority of these slaughter houses are situated in rural areas and mainly slaughter small stock for domestic use.

#### *(iv) Wholesalers*

This is where transformation of products such as processing, packaging, distribution and transportation takes place. In food system the major concern is the "food miles" as this affects or influences the availability, accessibility and affordability of food products. There are few livestock and livestock products wholesalers for export trade in Kenya and Isiolo County respectively. However, most of the stock from the small and medium scale traders is handled by these few wholesalers. They also do processing and distribution and determine the prices for products due to transformation and transportation expenses incurred. Hence manufacturing and value addition is prominent at this stage in the chain. In Isiolo County these wholesalers handle over 80% of the secondary market volumes.

#### *(v )Retailers*

Retailers are the major service providers of products to the final consumer. These include urban butcher shops, local retailers and super markets in some instances. In Isiolo County the retailers dominate the small ruminant's trade mainly in the interior and also undertake micro processing and distribution by themselves. The trade is highly informal or unmodified characterized with very short value chains. The majority producers (pastoralist and agro-pastoralist) prefer disposing their products to short distance markets and therefore find their way to closer retailers in the area. In this case the rate of commercialization of these products are still too low as there are negligible livestock based products currently seen at the shelves of local shops and super markets in the County.

#### *(vi) Transportation*

In Isiolo County over 80% of live animals are either driven on hoof or trucked to destination markets. This affects quality and safety due to long distances to reach secondary markets. While on trekking, there is inadequate pasture and water resources along the stock routes. Some of the animals are trekked for almost one week to reach the destination markets which are 180km to 220 km away. The major challenge here is lack of designated stock routes with established watering points, protected grazing areas, disease surveillance and screening points to protect the animals from loss of body weight or contracting trade sensitive diseases while on the way to destination markets. Hence the resultant effect is reduced quality and contamination due to poor safety measures.

#### *(vii) Consumers*

Consumption in our study has been categorized as domestic consumption (rural consumers and urban consumers) and external consumers which takes care of neighbouring counties and foreign consumers. The results indicate that about 85% of live animals traded are slaughtered and consumed externally (i.e. at the neighbouring counties and regional markets) while only 15% are slaughtered and

consumed domestically. The foreign external consumers have market specifications for products demanded and include specifications on traceability, grading and safety health measures of live animals and animal products traded.

### *C. Analysis of support institutions for the existing potential livestock value chains*

These actors are also sometimes referred to as the "meso actors", intermediaries or chain enablers. They provide support services for the key actors in performing their activities in order to take advantage of the existing markets for their products.

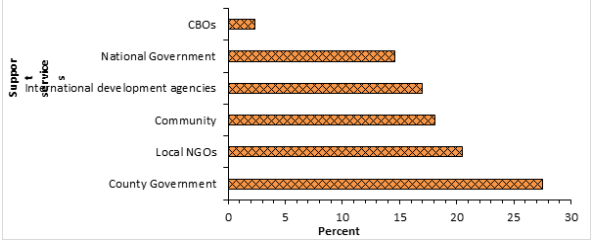
### *(I) Input suppliers*

These include the breeders (supply of breeding stock), provision of artificial insemination services (AI), livestock feed suppliers (supplements and concentrates), provision and supply of veterinary drugs mainly done by private individuals, groups and other local organizations. The challenge is that there is lack of breed improvement incentives with limited artificial insemination (AI) services due to low skilled or unavailability of professional persons. Currently artificial insemination activities are conducted by unscrupulous practitioners who inflate prices for services that do not meet standards. This unfair trade has mainly influenced poor adoption of the technology. In Isiolo County, the major input suppliers (e.g. veterinary drugs) include SIDAI and Oasis agrovets who are not able to cover the whole County.

### *(ii) Provision of extension services*

Service providers are indirect actors unlike the producers, transporters, traders, processors and marketers who are directly involved in the chain on daily basis. These include the County line departments (livestock and veterinary services) and financial service providers (e.g. Banks and SACCO's). Although the County Government of Isiolo provides extension services, the technical personnel are inadequate coupled with insufficient skills for entrepreneurship and commercialization of livestock value chains. Especially there is great concern for the technical personnel in the provision of veterinary services in order to meet specifications and standards for export trade. There is need for Community Based Animal Health Workers (CBAHW's) to cushion the deficit. While the CBAHW's were covered under the Veterinary policy for practitioners in a Country like Uganda this is not the case in Kenya. Hence policy gap is a major challenge in the sustenance of livestock food system not only in Isiolo County but the whole country. However, in many instances the private development agencies provide interventions through private extension services. However, there is low attitude of the majority pastoralist towards acquisition of loans and credit facilities. This is aggravated by socio-cultural and religious speculations on implications of interest rates and profits that accrue from acquired loans. Hence although these financial institutions are willing to offer services they face great challenges for convincing the local value chain actors to use these services.

### *D. Stakeholders analysis of existing livestock value chains*




The research findings indicate that various institutions provide support for the development of livestock value chains in the County. The County Government (27.5 per cent) and Local NGO's (20.5 per cent) play a significant role together adding up to 49%. The rest include the community (18.1 per cent), International development agencies (17 per cent), National Government (14.6 per cent) and the local community based organizations (CBO's) with 2.3 per cent.

Further analysis has indicated that 82.5 per cent of the respondents said that the networking of these organizations in the County is weak and hence poor coordination mechanisms. Only 17.5 per cent of the respondents acknowledge that the existing institutions "somehow work together" meaning they are poorly coordinated. This is also evidenced by poor monitoring and evaluation of value chains activities as observed during the survey. Those who indicated slightly joint working of the stakeholders associate these when there are opportunities for opening new markets or other workshops conducted by public or private organizations.

### *(i)Table 1: The type and role of Institutions that support the development of livestock and livestock products traded in Isiolo County*

| County Govt. Role | Responses | | Percent of Cases |
|---|---|---|---|
| | N | Percent | |
| Collection of revenue. | 64 | 44.8 | 66.7 |
| Provide security. | 36 | 25.2 | 37.5 |
| Improve infrastructure of current market. | 41 | 28.7 | 42.7 |
| Financial support | 2 | 1.4 | 2.1 |
| Total | 143 | 100 | 149 |
| | Responses | | Percent of Cases |
| Community role | N | Percent | |
| Enhance security. | 46 | 58.2 | 60.5 |
| Managing the market, | 25 | 31.6 | 32.9 |
| Buying and selling goods and services. | 8 | 10.1 | 10.5 |
| Total | 79 | 100 | 103.9 |
| | Responses | | Percent of Cases |
| National Govt. role | N | Percent | |
| Ensure proper market infrastructure. | 41 | 34.2 | 64.1 |
| Provide security. | 47 | 39.2 | 73.4 |
| Formulate policy. | 32 | 26.7 | 50 |
| Total | 120 | 100 | 187.5 |
| Local/International | Responses | | Percent of Cases |
| Development agencies | N | Percent | |
| Construction of market | 59 | 77.6 | 83.1 |
| Informing the community about market trends | 9 | 11.8 | 12.7 |
| Linking buyers to markets | 8 | 10.5 | 11.3 |
| Total | 76 | 100 | 107 |

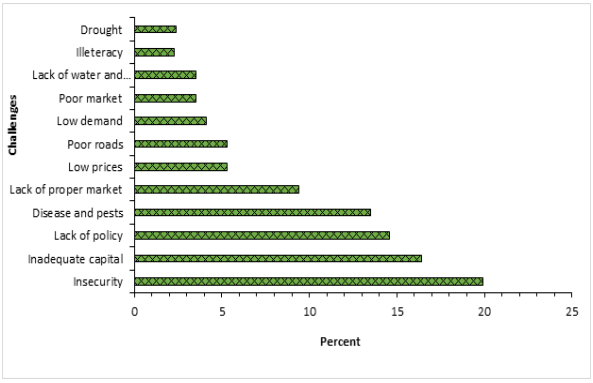
The results indicate that the major functions of the County Government include revenue collection (44.8%), provision of security (25.2%) and market infrastructure development (28.7%). The national government role includes provision of security (39.2%), market infrastructure development (34.2%) and formulation of policy (26.7%). On the other hand the community role includes enhancing security (58.2%), market management (31.6%) and involvement in the provision of services (buying and selling) at 10.1%. In summary, the critical indicator for the sustenance of livestock food system is security (41%), market developments (31.5%) and policy formulation (9%) and others only sharing 18.5%. The limitation is that the County Government is not associated with the formulation and enforcement of policies and legislations but rather as mainly tax collection. It is imperative to note that observations carried out during the survey show markets that are successful such as Oldonyiro, Kipsing and Isiolo central markets are due to community role in provision of security. Hence, co-management modules (CMM) where the community, National and County Governments have shared roles and benefits is paramount for the sustenance of livestock food system in Isiolo County.

### (ii) Table 2: Major priority activities (indicators) considered by the household and focus group discussions surveyed for ranking the development of support institutions

| | Responses | | Percent of Cases |
|---|---|---|---|
| Activities | N | Percent | |
| • Construction of modern markets | 57 | 52.8 | 67.1 |
| • Provision of water and fodder services | 27 | 25 | 31.8 |
| • Training/ capacity building farmers | 12 | 11.1 | 14.1 |
| • Disease /pest control | 9 | 8.3 | 10.6 |
| • Destocking/ off take | 3 | 2.8 | 3.5 |
| Total | 108 | 100 | 127.1 |

The findings indicate that 52.8% of the respondents associate development with construction of modern markets, provision of water

and fodder resources (25%), capacity building of value chain actors (micro) such as the producers, transporters, processors, retailers and wholesalers (11.1%) disease control (8.3%) and destocking or livestock offtake (2.8%).




**(iii) Figure 3: Stakeholders' perceptions of the challenges to sustainable livestock food system in the County**

The analysis indicate that the major threats for sustainability of livestock food system includes: insecurity (19.9 per cent), Inadequate capital for investments (16.4 per cent), lack of coherent policy (14.6 per cent), lack of reliable market (9.4 per cent), low prices (5.3 per cent), poor roads (5.3 per cent), low demand for products (4.1 per cent), inadequate pasture and water resources (3.5 per cent), drought (2.4 per cent) and illiteracy (2.3 per cent). The stakeholders' prioritized the solutions to attain the sustainability of livestock food system as stated: capacity building of the value chain micro actors (30.1 per cent), provision of security (16.9 per cent), linkage to financial institutions (15 per cent), need for regulations and enforcement (12 per cent), formulation of policy and creation of enabling environment for market infrastructure each standing at 5 per cent.

Currently, the institutional arrangements charged with the responsibility of sustainable livestock food system (LFS) are disjointed predisposing conflicting regulatory services (e.g. unharmonized or disparities in tax collection and sharing resources even among co-managed markets, poor disease surveillance and control mechanisms as well as inappropriate land use systems) resulting to unfavourable enabling environment for sustainable trade practices in the County.

### *E. Analysis of the enabling environment for the sustenance of livestock food system for domestic and export trade in Isiolo County*

#### *(I) Enabling environment (policies and legislations)*

This analysis involved key institutions that develop, enforce and implement policies and legislations on livestock food system in Isiolo County. They include: Institutions charged with the responsibilities to comply and enforce implementation of Global agreements for food system such as WTO, UNCTAD, UNFCCC (***CBD, CITES***), SDG's, MEA's; Regional frameworks (IGAD, EAC, COMESA) and their trade agreements; National Policies and legislations such as International trade policy, 2016; CAADP-Kenya Compact; Climate change Policy 2016; EDE – Kenya Compact 2017-2022), Livestock Policy 2008 (also revised 2014) and Legislations that influence quality and safety measures for livestock and livestock products export trade (e.g. meat control Act) and Isiolo County livestock Policies and legislations.

The National and County departments of livestock and veterinary services are the custodian of livestock food system trade (regional and global) in Kenya. However, in Isiolo County there are neither policies nor legislations to regulate LFS to enable meet market standardization for global trade. The Isiolo County Livestock policy 2016 and Isiolo County livestock Sale and yards Act, 2016 are all in draft form hence not yet implemented**.** To lesser extent private organizations such as KLMC, Local and International development agencies, NGO's, CBO's and FBO's are involved in advocacy and community sensitizations to enhance market access for local products.

**(ii) Analysis of household awareness and review of National and County regulatory frameworks**

***Figure 3: Results of household survey on awareness of National livestock food system regulatory frameworks***

| Food system policies | Count | Column N % |
|---|---|---|
| Not aware (undecided) | 54 | 47 |
| No | 58 | 50.4 |
| Yes | 3 | 2.6 |
| Total | 115 | 100 |

assumptions from the fact that policies and legislations are made without the concept of the pastoral communities who are supposed to be the policy consumers for effective implementation. Thus there is lack of participatory planning which is an indicator of weak sustainability mechanisms in policy implementation. In Holland/Dutch, for example, the socio-cultural planning agencies have taken central role in ensuring participatory planning during policy development. This is contrary to the case in Kenya where majority of livestock keepers are neither aware nor understand the intensions of the existing policies and legislations.

***Figure 4: Awareness of existing livestock food system regulatory frameworks in Isiolo County***

| Livestock food system regulatory frameworks in place | Count | Column N % |
|---|---|---|
| County Government | 83 | 72.2% |
| Public Health | 29 | 25.2% |
| Veterinary Control | 3 | 2.6% |
| Total | 115 | 100.0% |

The majority of the respondents (72.2%) associate existing food system regulatory frameworks with County Government's tax collection and price control services. About 25.2% of the respondents relate these policies to departmental obligations such as Public health inspections and veterinary control on animal movement permits (2.6%) respectively.

#### *(IV) Review of agricultural sector reforms on national livestock food policies and development strategies*

The livestock sub-sector has undergone immense reforms and policy adjustments over the last four decades. Some of these reforms have not been favourable to the development of livestock sub-sector especially the Structural Adjustment Programme (SAP) of 1980's which led to removal of price controls and unregulated liberalization that triggered unfavourable market requirements for livestock based products. This initially disfranchised the livestock market system and raised the levels of vulnerability in the system especially rural areas where the impact of informal and low market prices have most been felt. Some of the livestock sub-sector plan reforms aimed to boost livestock development in Kenya included: (i) The Sessional Paper No. 4 of 1981 (National Food Policy), (ii) Sessional Paper No.1 of 1986 (Economic Management for Renewed Growth), (iii) Sessional Paper No.1 of 1992 (Development and Employment in Kenya) and (iv) various National Development Plans. The main focus of these policy reforms and strategic plans was to improve economic management, accelerate national development, reduce poverty and food insecurity through commercialization and technological innovations in livestock value chains.

Specifically, a major problem in livestock food system was realized during the Sessional Paper No.1 of 1986 (Economic Management for Renewed Growth). The major setbacks were price and market liberalization, beneficiary participation and cost-sharing, parastatal reforms and restructuring and reorientation of policies to make the economy export driven in response to changes in the international economy. This was also followed by the National policy reform paper on public enterprise reform and privatization (1992) which focused on improving the productivity of state enterprises by privatization of commercial enterprises as strategic and non-strategic streamlined to be under the public ownership (GOK, 2006). These negative impacts made the Government of Kenya re-think and re-engineer it's policies and programmes hence the initiation of Economic Recovery Strategy for Wealth and Employment Creation (ERSWEC) commonly referred to as ERS (2003-2007) and Strategy for Revitalizing Agriculture (SRA , 2004) initiated during the inception of National Alliance and Rainbow Coalition (NARC) under President Kibaki's regime (2002-2007). Although some of these strategies considered private sector led growth, there still exist no effective or harmonized coordination framework to achieve the overall objective.

However, currently the National frameworks related to the livestock sub-sector are still anchored on the National Livestock Policy (2008) document which is now overdue for review. The primary responsibility for coordination and implementation of livestock and livestock products development is under the state departments of livestock development and veterinary services. The apex organizations for livestock food system include the Kenya Dairy Board (KDB, Kenya Meat Commission (KMC) and the Kenya Livestock Marketing Council (KLMC) which is the advocacy organ for livestock marketing in ASAL areas. The other critical frameworks that influence the sustenance of livestock food system include Kenya Bureau of standards (KEBS) for product quality control and standardization, National Environment and Management Authority (NEMA) responsible for waste management and environmental integrity and the County Public Health department in charge of food safety and certification.

It is imperative to note that firstly, the Government of Kenya established the KMC through an Act of Parliament; Meat Control Act, CAP 363 laws of Kenya, 1972 (also revised 2012) with the primary aim to regulate purchase, processing and canning, storing and marketing of beef, mutton, poultry and other meat foods for export or for consumption within Kenya. This legislative framework provides for control over meat and meat products intended for human consumption, and over slaughterhouses and places where such meat is processed; and to provide for import and export control over such meat and meat products; and for matters incidental to and connected with the meat industry.

***Firstly***, the Meat Control Act categorises the slaughter houses into three types based on the degree of sanitary requirements: These include;
(a) Class A: The Export slaughter house which is under the National Government for the purposes of licences. The regional export abattoir developed during the economic stimulus projects (ESP) in 2007 such as Isiolo, Garissa, Wajir, Turkana and West Pokot lies in this category. The challenge is that these abattoirs cannot be fully operated by a single county due to the extent of operation.

(b) Class B: Inter-county based slaughter houses which are under the County Governments control for trade purposes

© Class C : Domestic slaughter houses which are for local use. In Isiolo County there are about five of them.

***Secondly*,** The Animal Diseases Act, CAP 364, 1965 revised in 2012: This is an act of parliament that provides for the control of animal diseases and parasites and for measures to promote animal health. It is concerned with the control of animal diseases and quarantine of animals when at risk of spreading diseases. It is also concerned with the rules on immunization as well permits for animal movements. It also anticipates the reporting of notifiable diseases to the DVS. ***Thirdly*,** Veterinary Surgeons and Veterinary Para-professionals Act, 2011: This is an Act of Parliament that provides for the training, registration and licensing of veterinary surgeons and veterinary para-professionals; it also provides a legal framework for matters relating to animal health services and welfare, and for connected purposes. ***Fourthly*,** Investments Promotions Act of 2004: An Act of Parliament to promote and facilitate investment by assisting investors in obtaining licenses that are necessary for investing and by providing other assistance and incentives and for related purposes. ***Fifthly***, the veterinary surgeons and veterinary para-professionalsAct, 2011 provides for the training, registration and licensing of veterinary surgeons and para-professionals for matters relating to animal health and welfare services and for connected persons.

However, over the last 30 years the performance of this institution has been very poor triggered by institutional mismanagement which negatively impacted on the subsequent trade and overall national gross domestic product (GDP). It was not until 2003-2007 Economic Recovery Strategy for Wealth and Employment Creation (ERSWEC) which triggered the development of Strategy for Revitalizing Agriculture (SRA) 2004 and the vision 2030 blue print strategy (2008).

**(iv) Analysis of regional and international market requirements for livestock and livestock products export trade**

*The result indicates that different markets (regional and global) have different requirements for products. Below are the findings:*

| *Market* | *Criteria* | *Requirement* | *Comment for potential exporting Country* |
|---|---|---|---|
| *European Union (EU)* | Animal health status | Yes | Must be member of OIE & fulfill health standards + determine BSE status |
| | Food safety certification | Yes | System inspected by EU inspectors + food lab accredited + HACCP + AW |
| | Animal Identification & Traceability (AIT) | Yes | Comply with OIE std of AIT |
| | Residue Monitoring Plan (RMP) | Yes | Must have RMP approved by EU annually |
| *United States of America (USA)* | AHE status | Yes | US officially recognizes health status. Must be free from FMD, BSE + others |
| | Food Safety Certification | Yes | Supplier to be inspected, audited, verified & approved; food lab must be accredited; upholds WTO |
| | AIT | Yes | Imported meat must meet same labeling / branding requirements as US-meat |
| | RMP | Yes | Must implement RMP equivalent to US "National Residue Program for Meat, Poultry, and Egg Products" |
| *Middle East Markets (UAE)* | Food safety certification | Yes | System inspected by EU inspectors + food lab accredited + HACCP + AW |
| | AIT | Yes | Comply with OIE std of AIT |
| | RMP | Yes | Must have RMP approved by EU annually |
| *Isiolo County* | Animal health status | Not known | • Free status from trade sensitive diseases<br>• Screening areas developed and quarantine system imposed<br>• Enforce disease barriers legislations e.g. cross border based |
| | Food safety certification | Not requested or demanded | • System partially aligned with CAC (Certification by Public Health for food products e.g. meat and milk<br>• Need to enforce and align with CAC and HACC standards |
| | AIT | Very limited (Practiced in existing few ranches) | Only movement permits and CoT's |
| | Residue Monitoring Plan (RMP) | Does not exist | Need to be developed and institutionalized |

**DISCUSSION**

It is important to indicate that without a strong societal understanding of market oriented livestock food system through enhanced innovative and technological approaches to value chains development with focus on domestic and export trade then the concept of sustainability will ever remain a big challenge. The sustenance for pastoralism in arid and semi-arid regions like Isiolo County should focus on commercial oriented livestock production system through appropriate land use practices, breed improvements (milk and meat products) and overall husbandry practices. The strength of the sustainability of livestock food system in the County lies in the fact that there are promising value chains and support institutions (Development Agencies, Private actors, Civil society organizations) that can coordinate and enhance implementation of the regulatory mechanisms for sustainable trade.

The sustainability of livestock food system for export trade can only be attained if the existing holding ground (124,000 acres) and the feedlot (50,000 acres) for fodder supplementation are privatized for registered livestock traders and initiatives to improve the current breeds are undertaken. There is also need to develop contractual livestock production mechanisms through privatized market channels and value chain actors with linkages to financial institutions for support and star up capital arrangements. These private dealers in livestock and livestock products in "joint venture" with the County Government will provide consistent trade to the established export abattoir and hence stimulate effective and efficient operationalization of the market efficiency. Such policies have been proven successful in other regions such as Botswana and Ethiopia through government support for establishment of feedlots and other input suppliers. These arrangements have also enhanced capacity and knowledge development among the value chain actors and also stimulated formation of zonal platforms for communication and commercialization of profitable value chains.

The concern is that the existing regulatory frameworks are weak and failed to provide overall coordination, continuous assessments and review of livestock policies and strategic plans in order to ensure continued relevance and profitability. The current National Livestock Policy (2008) has already become outdated and requires review. The policy is not also consistent with the current Constitution of Kenya (2010) and the County Governments Act, 2012. Since the functions of livestock development is devolved to Counties under schedule four of the Constitution of Kenya (2010) there is therefore the need to develop County specific policy and regulatory mechanisms for livestock food system aligned with the new legislations. Further, as Poulton ( 2010) argues, building of capacities in the counties need to be undertaken to impart competencies in leadership and technical skills so as to meet the sustainability of livestock food system.

Apparently, the Kenya blue print development agenda (Vision 2030) with the aim to commercialization and development of livestock markets infrastructure for the arid and semi-arid regions is a justification for the need to develop the food system. The target is to improve and establish livestock processing facilities (e.g. abattoirs) for meat and other livestock byproducts in order to meet international market standards. It is also anticipated that National development projects such as the LAPSSET Corridor, international AirPort and the Resort City for Isiolo County will have greater impact on the sustainability of livestock food due to increasing need for land currently under livestock grazing, increasing rural-urban migration that will trigger high demand for transformations of animal products to sustain demand for different classes of the consumers. These therefore will influence a paradigm shift in the sustainable development of livestock value chains that put a lot of pressure on the scarce natural resources.

## IV. Summary findings. Conclusion and recommendations

### *A. Summary findings*

The study findings indicated over 90% of the potential value chains trade is driven by nomadic pastoralists and agro-pastoralists. However, they are mainly involved in primary production and most of the live animals traded are acquired from the neighbourhoods. The types of products traded are of low quality originating from poor quality breeds of animals. There is also inconsistent trade due to migratory patterns of pastoralists accentuated by unfavourable weather and climatic variations. Hence there is informal livestock food system contributing to weak access to regional and international markets due to lack of meeting standards.

Insecurity, poor markets infrastructure and land use system coupled with inadequate supply of inputs such as veterinary drugs have contributed to low quality products and byproducts. This is further constrained by limited implementation of existing policies and enforcement of legislations due to weak institutional coordination and regulatory frameworks.

Low quality and poor safety standards are also a major threat to sustainable trade due to lack of modern slaughter house(s) to enable meet international trade requirements. There are also no control mechanisms put in place among the local slaughter houses to safeguard quality and safety standards for trade. Majority of respondents interviewed indicated lack of awareness in existing livestock food system policies and legislations.

Our study also established there is lack of incentives to the micro actors (producers, traders, processors and marketers) on sustainable trade mechanism (feedlots and contractual farming) hence threatening sustainability of livestock food system. Inadequate knowledge in commercialization, lack of grazing plans, stock routes and lack of business plans also influence sustainable trade.

### *B. CONCLUSION*

The study concludes that the productivity of the main livestock value chains (camel milk, beef and shoats) face extreme threats due to insecurity, poor market infrastructure and intensifying degradation of grazing resources (water and pasture) . This is aggravated by inadequate and weak regulatory mechanisms to implement and enforce the existing policies and legislations in livestock food system. There are also extensive gaps in capacities and knowledge sharing for technological innovations among the various levels of value chain actors. Although the County has the potential for export trade both at national, regional and global level, the production and trade of livestock and livestock byproducts are highly dependent on the conditions of seasonality (weather patterns) and availability of grazing resources with very minimal regulatory mechanisms in place to combat challenges of quality and safety measures in order to attain global standards.

### C. Recommendation

#### *Operational recommendations*

(i) Improve productivity of potential value chains (Beef, Camel milk, Sheep and Goats):

In order to achieve sustainable livestock food system there is need for change from one tier (traditional or local) food system to modern agri-industrial food system for viable commercialization of livestock and livestock based products.

(ii) Contractual farming system for export oriented trade

The County should take the initiative to develop "contractual farming model" which can be a joint venture between the County Government and local traders or even on private basis. This model is implemented both in Botswana and Ethiopian governments. This will enhance consistent trade through empowerment of the traders and established regulatory mechanisms exacerbating quality and safety products for destination markets.

(iii) Joint venture (Public Private Partnership) business model for the operationalization of the export abattoir

An effective sustainable model for the livestock and livestock products trade in the County can be achieved only through a "joint venture business model" between the County Government and a willing private partner(s). The assumption is that the County Government alone will not have the capacity (managerial and technological skills) and financial obligations to run the established export abattoir. The regional and international export trade system requires massive financial resources and "know how" to run the processes along the value chain functions especially the finishing and the marketing of products. This study recommends that its only through a "joint venture" model that the County government is able to put effective regulatory and residue monitoring plans essential for quality and safety control measures.

(iv) Environmental management and energy conservation

Establish effective mitigation and adaptation mechanisms to combat climate change and climatic variability through strengthening local institutions (e.g. deedha) on land use plans and environmental conservation in pasture and water resources management.

In terms of waste and energy management there is need to adopt use of solar energy to substitute the current established electricity and standby generator which are neither cost effective nor environmental friendly respectively. This study also suggests that the existing borehole developed for the operationalization of the export abattoir can also be run on wind or solar energy in order to embrace low environmental pollution. Solar run boreholes can also be established along the stock routes to reduce on energy costs.

#### *Institutional recommendations*

(I) Sustainability of livestock food system will depend on acquiring reliable data or statistics for various value chains traded in the County. Currently this is one of the major challenges facing the department of livestock production and veterinary services who are the custodian for the implementation of livestock policies, legislations and strategic

development plans. The departments of livestock development and veterinary services in the county should therefore carry out periodic livestock census to establish reliable database in order to develop a rationale for development of the sub-sector. The statistics for establishing accurate livestock numbers will enhance effective spatial, temporal and land use planning system respectively.

(ii) Our study also establishes that in order to attain sustainability there is need for the County Government of Isiolo to build the capacities of the local communities to carryout sustainable trade in livestock and livestock based products. This can be achieved through strengthening and integrating the local institutions. These institutions should have a common regulatory and implementation framework for purposes of effective monitoring and evaluation of livestock food system in the Cin livestock subsector

(iii) Develop strong partnerships and networks to enhance capacity build of the relevant institutions for value chains developments. This will uphold quality and safety trade mechanisms while maintaining environmental integrity in terms of natural resources management and waste management. Further, the partnership will explore more diverse opportunities for commercialization of potential value chains that can are relevant at domestic, regional and international levels

(iv) Institutionalize community land management committees
This framework will oversee the sustainable use of communal lands, establish grazing control plans for sustainable livestock food systems. This is will be in tandem with capacity building of these local institutions in trade policy and global requirements for food system.

***Policy recommendations***

Sustainability of livestock food system is difficult to attain without having effective policy mechanisms in place to provide efficient guidance and control of quality and safety standards for value chains traded both locally and externally. The policy should enforce establishment of quality business plans for commercially oriented and potential value chains traded across the various actors of food system. This will enhance strict adherence to regional and international trade requirements.

The County need to establish intra and inter-County as well as cross-border livestock and livestock products trade linkages through harmonized policies and strategies focused to domestic and international trade.

Land use policies for adequate utilization of grazing resources (pasture and water) through formulation of intra and inter-County resource use, peace and conflict resolution committees is paramount for sustenance of livestock food system. Land use policies should be aligned with the current community land Act, 2016, the National community land management and land registration legislative frameworks (2012) guided by the National land policy, 2012 in order to limit illegal community land transfers or leases to second or third parties without prior concept of the community believed to own the land originally.

***Regulatory recommendations***

The primary focus of attaining sustainable livestock food system in the County will be to establish an effective livestock food system regulatory framework guided by the livestock policies and legislative frameworks in place such as the National livestock policy (2008) and Isiolo County livestock sale yards Act, 2016. There is also need to establish County specific food and drug control policy to establish a regulatory board or council to provide guidance or regulate day to day activities, control and monitor the quality and safety of products traded in alignment with international standards. This regulatory board will work in consultation and cooperation with the National arms of government charged with the responsibility of livestock food system. These specifically include the state departments of livestock and veterinary services, the department of public health charged with the mandate of food and drug control, the trade department (Ministry of foreign affairs) for international trade practices and other livestock productivity advocacy apex bodies such as Kenya livestock marketing council (KLMC). This is the feasible way to ascertain compliance with the regional and international standards requirements for quality and safety products. The regulatory mechanism will enforce the following sustainability indicators for sustainable livestock food system in the County:

(1) Provide enabling business environmental for regional and international trade through development of feasible policies and legislations aligned with the global standards i.e. WTO TBT and SPS standards. This will enhance specialization in products and also development of business plans for viable value chains.

(2) Enforce animal identification and traceability (AIT), animal health inspection and certification measures so that the origin of livestock and livestock products are well known. This will establish the level of prevalence to specific trade sensitive diseases that influence the international trade. The categories for specification for acceptance of products such as meat or milk are either free, low or high status. At high status of contamination the products are usually condemned for any trade purposes. These process or results are achieved only through effective diseases surveillance and monitoring. Thus, there is need for strict adherence to live animals or products inspection, certification or approval of movements from one area to another. Where animals are suspected of any kind or type of diseases then the animals should be subjected to laboratory sampling and tests for diagnosis. Appropriate mechanisms should be put in place for "NO objection" and movement permits procedures to enhance feasible animal welfare and transportation modalities.

(3) To enhance sustainable land use system, there is need for community sensitization on the recent Community land Act, 2016 and land registration, 2012 for delineation of communal grazing lands into rational seasonal grazing units, creation of stock routes for trade purposes and protection of holding grounds for purposes of disease free zones and screening areas. The County should also put in place an effective regulatory body for drought management and mitigation to enhance sustainable livestock production and environmental integrity. This body will be charged with the responsibility to align the County environment and drought related policies with the multi-lateral and bilateral disaster response regulatory frameworks such as the Ending Drought Emergency (EDE) by 2022 and IGAD ICPT on transhumance and pastoral free movement protocols and the UN climate change frameworks.

These regulatory mechanisms will finally strengthen institutional networks and coordination and there will improve capacities of various levels of value chain actors through diverse knowledge sharing platforms. More important also will be improved mechanisms for early warning and disaster mitigation measures hence improved resilience. The outcome therefore for this livestock food system regulatory framework will be improved productivity of potential value chains, enhanced resilience to drought disasters and effective institutional coordination mechanisms. The framework will also enhance put in place residue monitoring plan (RMP) for effective regional and international trade. Hence, In order to meet global standards for sustainable trade of livestock and livestock by-products, there is need for establishing an effective and efficient livestock food system regulatory framework in Isiolo County.

***Recommendations for further research***

1. Livestock food system is highly dynamic and undergoes frequent transformations to meet the demand and taste of the ever increasing human population. There is therefore the need for exploration of opportunities for potential value chains and critical analysis of the livestock food system supply chains for sustainable regional and international trade.

2. More research required on the current emerging livestock diseases such as the camel swollen gland and sudden deaths, Rift Valley Fever (RVF) for large stock and PPR for the case of small stock..

3. Conduct further research to understanding better management of community lands and sustainable land use issues that comply with the changing pastoral land use systems.

4. Conduct research for sustainable regional integration and coordination mechanisms for effective implementation of international and regional treaties and agreements e.g. cross-border trade practices

**V. ACKNOWLEDGEMENT**

We extend our gratitude to all the livestock value chain actors interviewed during the study for providing valuable information that enabled completion of this study. Further appreciation is also extended

to key departmental heads from public and private sectors for sharing their reports and experiences pertaining to livestock food system in Isiolo County.

## VI. REFERENCES


[1] Clapp, J. and Cohen, M.J (eds) 2009: The global food crisis; Governance challenges and opportunities. Waterloo, ON; Wilfrid Laurier University Press.
[2] Clark, P. (2010): Sowing the Oil? The Chavez Government's Policy framework for an alternative food system in Venezuela. Humboldt Journal of social relations; 33, 135 – 165.
[3] Codjoe SNA (2010): Population and agricultural land use in the African plains of Ghana; Lambert Academic Publishing, Saar bracken. pp 72-93
[4] Colonna, P. (Ed), 2014: Food System Sustainability: Insights from duALIne: Cambridge University Press, New York
[5] Connelly, S. (2007): Mapping sustainable Development as a Contested Concept, Local Environment: The international journal of justice and sustainability,Vol.12 No.3; London, UK. Also available at http/www.landfonline.com/loi/cloe20
[6] Davies S (1996): Adaptable livelihoods: Coping with food insecurity in Malian Sahel. MacMillan Press Ltd, London
[7] Davidson, O. et al., (2003): The development and climate nexus: The case of Sub-Saharan Africa (SSA): Climate policy 3S1.S97-S113
[8] Donovan, J and Poole, N (2014): Changing Asset Endowments and Smallholder Participation in High Value Markets. Evidence from certified coffee producers in Nicaragua; Food Policy 44; 1-13
[9] Ericksen, P.J (2008): Conceptualizing food systems for global environmental change research. Global environmental change; 18, 234-245
[10] Ericksen, P. J (2008b); What is the vulnerability of a food system to a global environmental change? Ecology and society 13(2): 14 http.www.ecology and society.org/vol13/iss2/art14/
[11] FAO (2011): A value chain approach to animal diseases risk management; Technological foundations and practical framework for field application, Rome.
[12] Farah, K.O (1994): The communal rangelands of North East Kenya: Sustainable development for North East Kenya. Ed A. Umar, Crescent of Hope, Nairobi.
[13] Field, C.R (2005): Where there is NO Development Agency: A manual for pastoralists and their promoters; NR International, Aylesford, Kent, UK pp 60-62
[14] Forster, T and Esceduro, A.G. (2014): City regions and landscapes for people, food and Nature. Washington D.C. ; EcoAgriculture Partners.
[15] Government of Kenya (2010): The Constitution of KenyaGovernment of Kenya (2017): Community Land Act, 2016
[16] Government of Kenya (2012): National Food and Nutrition Security Policy; Sessional Paper No.1 of 2012
[17] Government of Kenya: International Trade Policy, 2017
[18] Government of Kenya (2015): Isiolo County Livestock Sales Yard Act, 2016 Government of Kenya (2015): The County Integrated Development Plan (CIDP); Isiolo County
[19] Government of Kenya (2012): The Development Strategy for Northern Kenya and Other Arid Lands: Vision 2030
[20] Government of Kenya (2010): National Policy for the sustainable development of Northern Kenya & Other arid lands.
[21] Government of Kenya (2008): The National Livestock Policy; Also revised 2015
[22] Government of Kenya (2007): Kenya Vision 2030: A globally competitive and prosperous Kenya: Government printers, Nairobi.
[23] Herreo, M. et al., (2009): Livestock, livelihoods and the environment: Understanding the tradeoffs; Cambridge University Press, UK.
[24] ILRI (2003): Economic, Institutional and Policy Constraints to Livestock Marketing and Trade in West Africa: ILRI, Kenya
[25] Ingram, J. (2011): A food system approach to researching food security and it's interactions with global environmental change. Food security 3, 417-431
[26] Johns, T., Powell, B., Maundu, P., and Eyzaguirre, P.B (2013); Agricultural Biodiversity as a link between traditional food system and contemporary development, social integrity and ecological health. Journal of the science of food and agriculture, 93, 3433-3442
[27] Kamara, A., Swallow, B. and Kirk, M.(2003). The Role of policies and development interventions in pastoral resource management; The Borana rangelands in Southern Ethiopia. Socio-economics and Policy Research Working Paper 53, 1-34 ILRI, Nairobi.
[28] Kirwan, J. and Maye, D. (2013); Food security framings within the UK and the integration of local food systems; Backlighting the role of transitional supermarket chain. Agriculture and Human Values, 22, 291-302
[29] Li, C. et al., (2013): Towards a societal scale environmental sensing network with public participation: International Journal on sustainable development: World ecology (20)
[30] McGinnis, M. D and Ostrom, E (2014). Social-Ecological System Framework; Initial changes and continuing challenges; Ecology and society 19(2)
[31] McMichael, P. (2011). Food system sustainability; Questions of environmental governance in the new world (dis)order. Global environmental change, 21, 804-812.
[32] Miller, M., Anderson, M., Francis, C.A., Kruger, C., Barford, C., Park, J. and McCrown, B.H. (2013): Critical research needs for successful food systems adaptation to climate change. Journal of Agriculture, Food System and Community Development, 3, 161-175
[33] Mount, P. (2012): Growing local food; Scale and local food system governance. Agriculture and Human Values, 29, 107-121.
[34] Okidi, C.O., Kameri-Mbote, P and Akech, M (Ed) 2008; Environmental Governance in Kenya; Implementing the Framework Law; East African Education Publishers Ltd, Nairobi, Kenya pp61-64; 260-280
[35] Opschoor, J.B (1994): Managing the environment; The role of economic instruments; Paris; OECD pp 61-64
[36] Ostrom, E (2009): A General Framework for Analyzing Sustainability of Social Ecological Systems; Science 325; 419-422
[37] Pereira, L.M. (2013): The future of the food system: Cases involving the private sector in South Africa. Sustainability, 1234-1255.
[38] Pratt, D. J and Gwynne, M. D (Ed) 1977; Rangeland Management and Ecology in East Africa; Hodder and Stoughton, London.
[39] Rakodi, C (2002): A livelihood approach: Conceptual issues and definitions; Earthscan, London. pp3-22
[40] Sobal, J., Khan, L.K and Bisogni, C (1998); A conceptual Model of the Food and Nutrition System; Social science and medicine 47; 853-868
[41] Sonnino, R. (2013): Local sood scapes; place and power in the agri-food system. Acta Agricluturae Scandinavica Section B: Soil and plant science, 63, 2-7
[42] Tana River County Livestock Grazing Control Act, 2017
[43] Thornton, P.K., Ericksen, P.J., Herrero, M. and Challinor, A.J. (2014): Climate variability and vulnerability to climate change: A review. Global change biology, 20, 3313-3328.
[44] Thornton, P. et al., 2013: Livestock and global change; Emerging issues for sustainable food systems; International Livestock Research Institute, 0100 Nairobi, Kenya
[45] Thornton, P. et al., (2013): The impacts of climate change on livestock and livestock ecosystems in developing countries; A review of what we know and what we do not know; Agricultural systems 10(3)
[46] Wegener, J., Raine, K.D. and Hanning, R.M. (2012): Insights into the Government's role in food system policy making: Improving access to healthy, local food alongside other priorities. International Journal of Environmental Research and Public Health, 9, 4103-4121.
[47] Weiss, B. (Edn) 1992: In Fairness To Future Generations; International Law, Common Patrimony, and Intergenerational Equity; The United Nations University, Tokyo-Japan. pp 47-84; 197-212
[48] Wossen, T. (2013): Social network effects on the adoption of sustainable natural resources practices; Addis Ababa, Ethiopia