Knowledge System of Land Use Potential (KSLUP) for Food Security among Pastoralists: A Case Study for Wajir County

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Abstract

Wajir County is classified as rangeland with regard to its land use. Despite the fact that the County has a large land mass cover of 56,685.8 sq Km; little research has been done to determine its land use potential. The study focused on knowledge system of land use potential (KSLUP) in Wajir County. It employed cross-sectional survey design. The target population was 661,941persons belonging to 90,108 households out of which a sample 222 households was drawn. A questionnaire was used to collect primary data from the household heads. Collected data was analyzed using SPSS version 20 and excel version 2010. Results from data analysis showed that majority of the respondents had more goats and sheep, a few had camels, local poultry, cattle, bee hives an at least a donkey. Livestock production was the main source of income, followed by crop production. Other source of income included sales from tree products (gums/resins) and building materials. Communal land ownership was dominant in the county with results indicating that most of the respondent who owned land had acquired through self-proclamation/declaration. There were several challenges facing land use in the county including land grabbing, human-wildlife conflict, environmental degradation and livestock diseases among others. To improve the present land use, there was need to build the capacities of the pastoralists on management of rangelands, train on gums and resins production, provision of agricultural subsidies, construction of boreholes/dams for irrigation, control of wildlife menace, livestock disease surveillance, control of unplanned settlements and environmental conservation. The study also proposed policies to be formulated by county government to improve land use.

Keywords: Land Potential Use, Knowledge System, Food Security, Pastoralists

Introduction

Land Use in Kenya

The Republic of Kenya has a total land mass of 582,646 comprising 98.11% land and 1.89% water surface. Only 20% of the land surface can support rain-fed agriculture (medium to high potential). About 75% of the population live in these areas with population densities as high as 2000 persons per sq.km in some parts. The remaining, approximately 78% land, is arid and semi-arid and is devoted to pastoralism and wildlife conservation. Competition for the scarce resources in these areas often results in conflicts among communities and between humans and animals. The frequent conflicts have affected utilization of land for food production resulting into widespread hunger and food insecurity (Kenya Land Alliance, 2002). In Kenya arid and semi- arid lands (ASALs) also referred to as rangelands (Herlocker, 1999), are characterized by low, erratic and unreliable rainfall, high temperatures, low humidity, low soil fertility and poor drainage (Southgate and Hulme, 1996, Ekaya, 2001).

A rangeland is defined as land carrying natural or semi-natural vegetation which provides a habitat suitable for herds of wild or domestic ungulates (Homewood, 2004). They can be found in all bioclimatic zones of the world, with a completely different appearance according to their location. However, they have two important common features. They are always used as grazing land by wild and domestic herbivores and historically they were inhabited by pastoralists and hunter-gatherers (Blench & Sommer, 1999).

Land Ownership in Kenya

Currently land in Kenya is legally categorized as being public, communal or private. Of the total land area of 582,646 sq. km, 77,792 sq. km (or 13.34%) is under public ownership, 107,953 sq. km (or 18.5%) is under private ownership and 396,315 sq. km (68%) is under communal ownership. The proportions of public and community lands are expected to reduce while private lands will continue to increase as more land gets alienated to individuals or institutions under leasehold terms through the process of land adjudication and registration (Kenya Land Alliance, 2002).

1.3 Land Policy

Land plays a significant role in society and is the locus of productive activities and source of political power. Nations are land based units whose boundaries reflect social, cultural and political identity. The importance of land utilization in the economic and social activities of any nation demands the formulation of a comprehensive land use policy to effectively manage it as a valuable resource.

Two important Government policy documents recognize and emphasize the importance of land. The National Land Use Policy which guides the management and use of land in the country and Sessional Paper No. 3 of 2009 which provides land policy recommendations that have been identified, analyzed and agreed upon by stakeholders.

Land policies are important in addressing issues related to utilization of land and land related resources by providing principles and guidelines for:-

1. Proper management of land resources to promote public good and general welfare
2. Land use planning to enhance sustainable development
3. Anchoring land development initiatives
4. Mitigating problems associated with poor land use
5. Promoting environmental conservation and preservation
6. Preparation of a national spatial plan and integration of various levels of land use planning

Source: Kenya Land Alliance, 2002

Kenya's policies on land use are well intended, but their limitations to narrowly defined sectors of the economy has led to undesirable ecological and socio-economic implications for biodiversity conservation and livestock production in arid and semi-arid lands(ASALs). The Kenya government has sought to increase the productivity of ASALs through dry land agriculture and intensified livestock production (GOK, 1994; Southgate & Hulme, 1996).

Pastoralist and Agro-Pastoralist Livelihoods Zones in Wajir County

Wajir County has five livelihoods zones, which comprise of distinct development challenges and opportunities. The majority of households practice nomadic pastoralism with a few in the northern hills bordering the republic of Ethiopia practicing agro-pastoralism. Crop production activities are carried out in the Lorian swamp and Ewaso-Ngiro belt in Habaswein and along the drainage lines in Bute sub-county. Crops grown include maize, sorghum, beans, fruits and vegetables. The total arable land in Wajir County is 1,024.06 sq. Km. which is 1.8% of Wajir land mass, while the total cultivated land is approximately 3,823 hectares.

Livestock contributes three-quarters of households' income and food sources while the remaining quarter comes from crop production. There are 1.12million animals kept among them cattle, camels, goats, sheep and donkeys. The livestock sector accounts for over 70% of incomes earned under the pastoral livelihood zone in the county and employs over 65% of the county's labour force. However, the sector experiences challenges due the drought that results in perennial water and grass shortages, poor soil fertility, disease and pest prevalence, poor markets, inadequate farm inputs, lack of credit facilities, overgrazing and resource based conflicts. Due to these challenges, nearly two-thirds of the residents live below the poverty line (Wajir KFSSG, 2011). The study was designed to determine baseline data on the knowledge system of land use potential (KSLUP) of Wajir County.

Materials and Methods

Study Area - Wajir County is the largest county in the North Eastern part of Kenya and comprises 6 sub counties namely; Wajir East; Wajir West; Wajir North, Habaswein, Tarbaj and Eldas. According to the Kenya National Bureau of Statistics (2009), the population in Wajir County was 661,941 with Male constituting 55 % while 45% were Female. Age Distribution was 51.8 % (0-14 years), 45.9 % (15-64 years) and 2.2% (over 65 years). There were 90,108 Households. Poverty Levels were reported at 64.0 % while literacy level was reported as 24.8% (KNBS, 2009). Wajir County has five livelihood zones i.e. agro-pastoralists, camel pastoralists, cattle pastoralists, mixed animal species pastoralists and Wajir shallow wells areas, (GOK, KFSSG, 2011).

Research Design and Sampling Procedure – A cross-sectional study design was used for this study. Random sampling procedure was used to obtain a sample of 222 household heads from the eight sub-counties of Wajir County.

Data Collection Procedures and Data Analysis - Individual visits were scheduled with household heads for interviews and data collection. The data collected was analyzed with the aid of SPSS version 20 and excel 2010. The objectives were analyzed quantitatively by use of descriptive statistics and the findings presented by frequencies, percentages and graphs.

Results and Discussion

Demographic Factors of the Respondents

Gender of the Respondents

Table 1: Gender of the Respondent

Sub-county	Gender of the Respondent		Total (%)
	Male (%)	Female (%)	
Wajir East	6.8	1.8	8.6
Wajir West	9.5	4.1	13.5
Bute	3.6	0.9	4.5
Eldas	13.1	0.9	14.0
Tarbaj	21.6	6.3	27.9
Habaswein	8.1	3.6	11.7
Buna	10.8	2.7	13.5
Wajir South	5.9	0.5	6.3
Total	**79.3**	**20.7**	**100.0**

A total of 222 respondents participated in the study. Of these, 79.3% were male and 20.7% female. Tarbaj Sub-County produced the highest percentage of respondents (27.9%) of which 21.6% were male and 6.3% were female. The lowest percentage of respondents (4.5%) was drawn from Bute Sub-County with males making 3.6% and females 0.9%.

Age of the Respondents

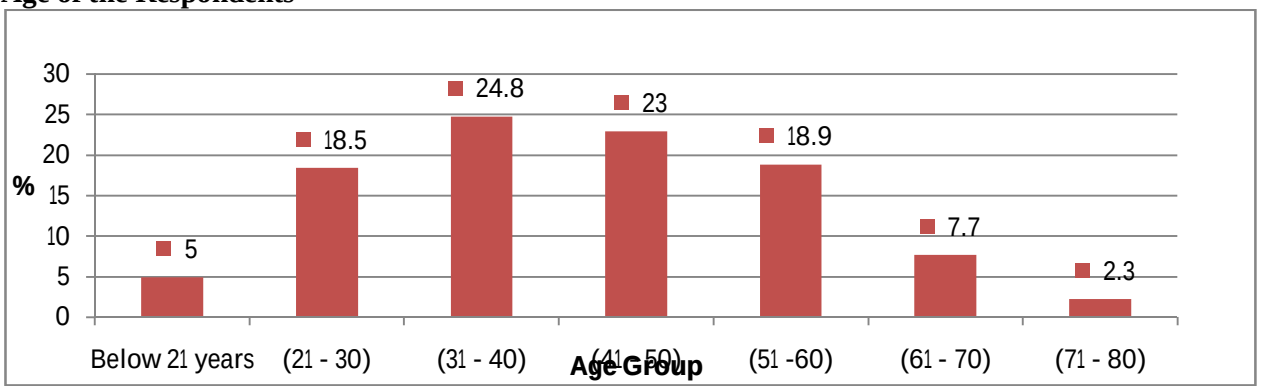
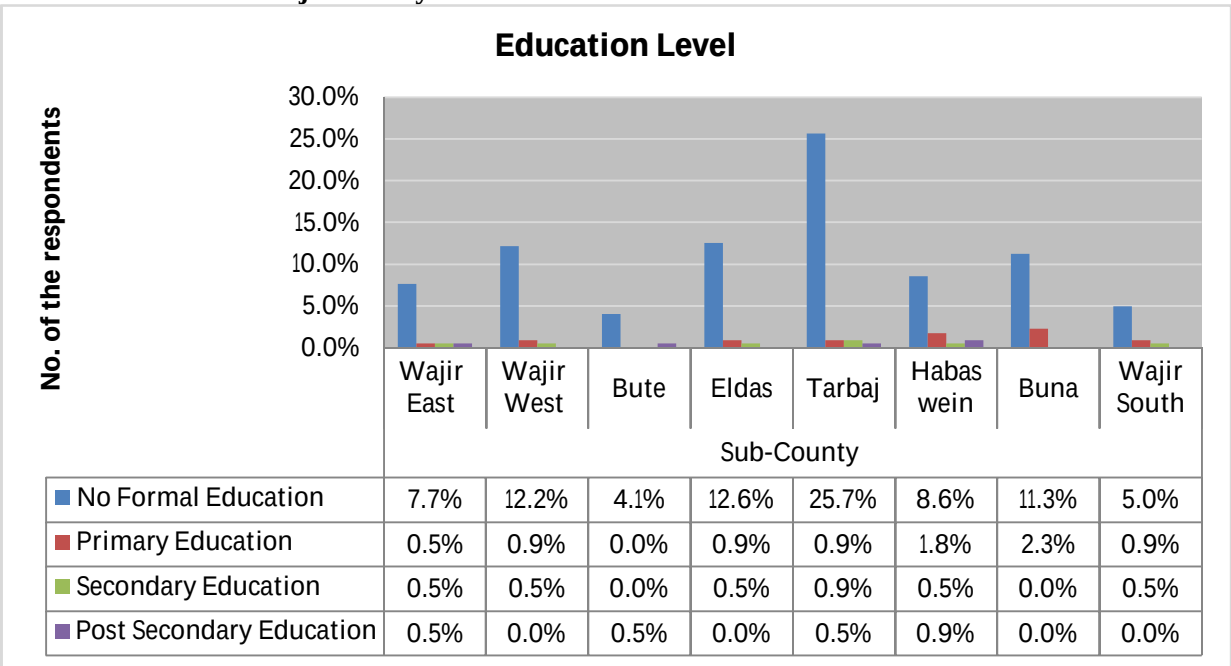


Figure 1: Percentage Age of the Respondents in Wajir County

Most of the respondents (24.8%) were aged 31-40 years while the lowest percentage (2.3%) was aged over 71 years. Cumulatively, 85% of the respondents were evenly distributed among the age categories above 21 years but not older than 60 years.

Education Levels in Wajir County



	Wajir East	Wajir West	Bute	Eldas	Tarbaj	Habas wein	Buna	Wajir South
No Formal Education	7.7%	12.2%	4.1%	12.6%	25.7%	8.6%	11.3%	5.0%
Primary Education	0.5%	0.9%	0.0%	0.9%	0.9%	1.8%	2.3%	0.9%
Secondary Education	0.5%	0.5%	0.0%	0.5%	0.9%	0.5%	0.0%	0.5%
Post Secondary Education	0.5%	0.0%	0.5%	0.0%	0.5%	0.9%	0.0%	0.0%

Figure 2: Education Levels in Wajir County

Results showed that 13.4% of the respondents had formal education while 7.6%, 3.2% and 2.3% had attained primary, secondary and post-secondary education respectively. The county's average literacy level is 24.8%. The literacy rate in the North Eastern Province (8.0%) (Kilele, 2007) in which Wajir County falls is lower than the country's average (61.5%) (Kenya National Adult Literacy Survey, 2006). The low level of literacy in the county makes it difficult for the pastoralists to access crucial agricultural information. This is because cumulatively, 86.6% of the respondents had no formal education.

Levels of Income from Livestock and Livestock Products

According to the results, majority of respondents (88.74%), earn less than Kshs. 100,000 per rainy season of 5 months. This income is derived from the sale of live animals and livestock products such as milk, meat, hides and skins. Those who earn between 100,000-200,000 constitute 7.21% whereas only 0.45% earns more than Kshs. 800,000. Figure 2 summarizes the income earned from livestock in Wajir County.

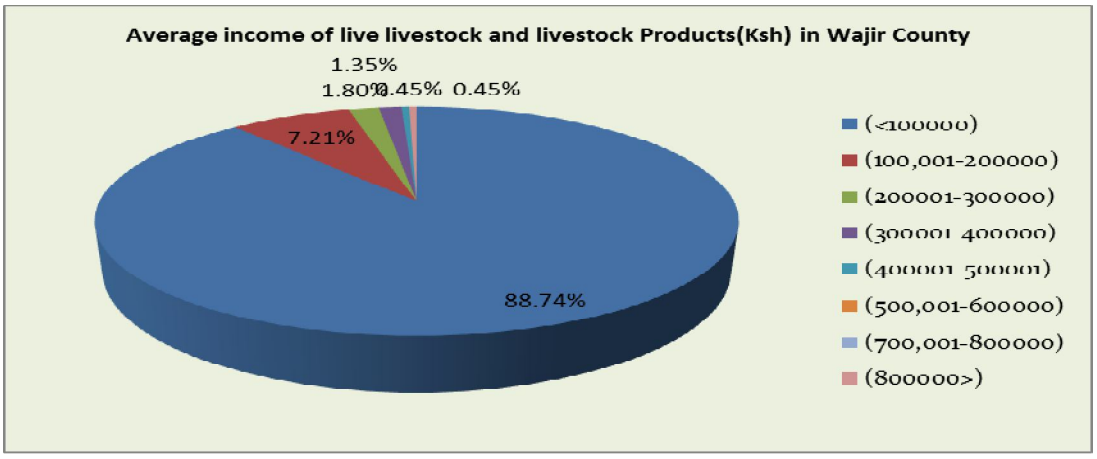


Figure 3:AverageIncomefrom Livestock and Livestock Products

Income from Crops, Gums and Building Materials

Table 2: Income from Crops, Gums and Building Materials

Sub County	Crop Production		Gums and Resins				Building Materials
	(<25,000)	(25,001-50,000)	(<25,000)	(25,001-50,000)	(50,001-75,000)	=(100.000>)	(<25,000)
Wajir East	100.0%	-	78.9%	15.8%	5.3%	-	100.0%
Wajir West	96.7%	3.3%	100.0%	-	-	-	100.0%
Bute	100.0%	-	100.0%	-	-	-	100.0%
Eldas	100.0%	-	100.0%	-	-	-	100.0%
Tarbaj	100.0%	-	98.4%	-	-	1.6%	100.0%
Habaswein	92.3%	7.7%	100.0%	-	-	-	100.0%
Buna	100.0%	-	100.0%	-	-	-	100.0%
Wajir South	85.7%	14.3%	100.0%	-	-	-	100.0%
Total	**97.7%**	**2.3%**	**97.7%**	**1.4%**	**0.5%**	**0.5%**	**100.0%**

Majority of the respondents (97.7%) earned less than Ksh. 25,000 from crop production while 2.3% of the respondents from Wajir West, Habaswein and Wajir South earned an average of Kshs. 50,000 from the crop production in one rainy season. Wajir West (in Wagalla) covers part of the Wajir shallow wells where farmers grow horticultural crops which supply the Wajir town fresh horticultural market. The main crops grown include; fruits (pawpaw, water melon and lemon), cereals (maize, sorghum and millet), pulses (beans, green grams and cowpeas) and vegetables (kales and spinach). It should be noted that crop production in Wajir County is mainly rain fed. Most respondents (77.3%) earned less than Ksh. 25,000 from gums and resins while 15.8% and 5.3% of the respondents earned between Kshs. 2,500-50,000 and Ksh 50,001-75,000 respectively. A small percentage of farmers from Tarbaj (1.6%) earned more than Kshs. 100,000 from the same enterprise. All the respondents earned less than Ksh. 25,000 from building materials (i.e. limestone, harvested stones, sand and posts).

Land Ownership

Table 3: Type of Land Ownership in the Area

Sub-County	Type of Land Ownership in the Area		Total
	Communal	Individual Land Tenure Ownership	
Wajir East	100%	-	100%
Wajir West	100%	-	100%
Bute	100%	-	100%
Eldas	100%	-	100%
Tarbaj	100%	-	100%
Habaswein	100%	-	100%
Buna	96.7%	3.3%	100%
Wajir South	100	-	100%

In all the sub-counties except Buna, all the respondents reported communal land ownership as the dominant land tenure system in the county. However, in Buna Sub-county, 96.7% indicated that they owned land communally while 3.3% reported that they had individual land tenure systems, though they did not have legal documents (title deed/ letter of land allocation) to the land owned.

The sampled respondents noted that, the communal land is used by everyone for grazing. The land owned by individuals was mainly for purposes of building homesteads/*manyattas*.

Modes of Land Acquisition

Figure 4 below shows the results for the mode of land acquisition. Cumulatively, majority of the respondents (92%) indicated that land was acquired through self-proclamation/declaration while 8% of the respondents reported to have acquired land by inheritance through a process where they fenced off parcels of land at their own well. Since land is in plenty, compared to. Eldas and Buna sub-counties had the highest percentages (26% and 27% respectively) of those who reported that land acquisition was through inheritance and allocation by the community elders.

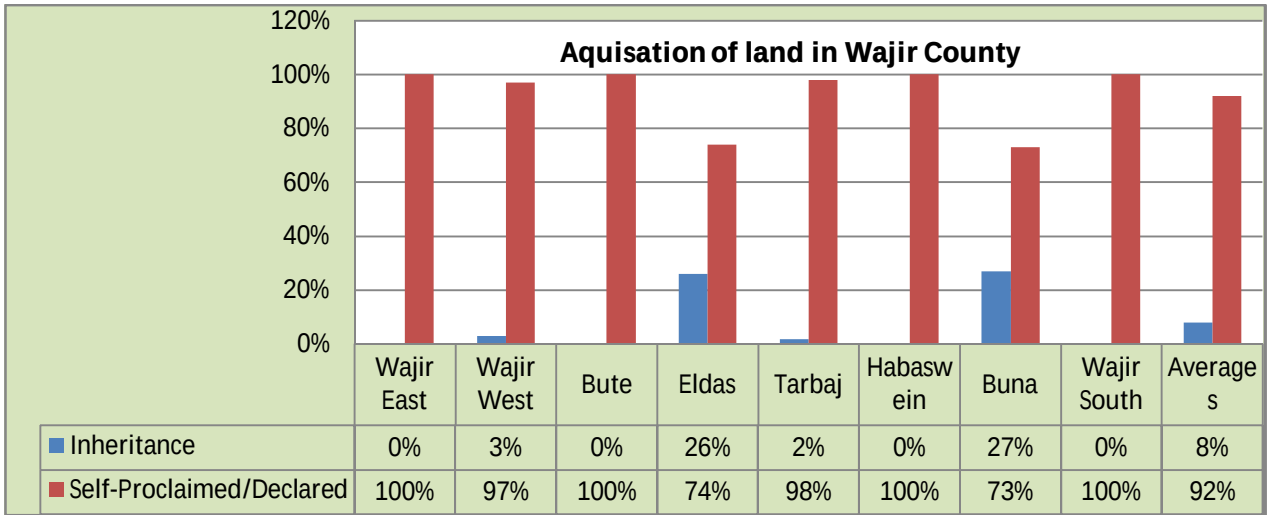
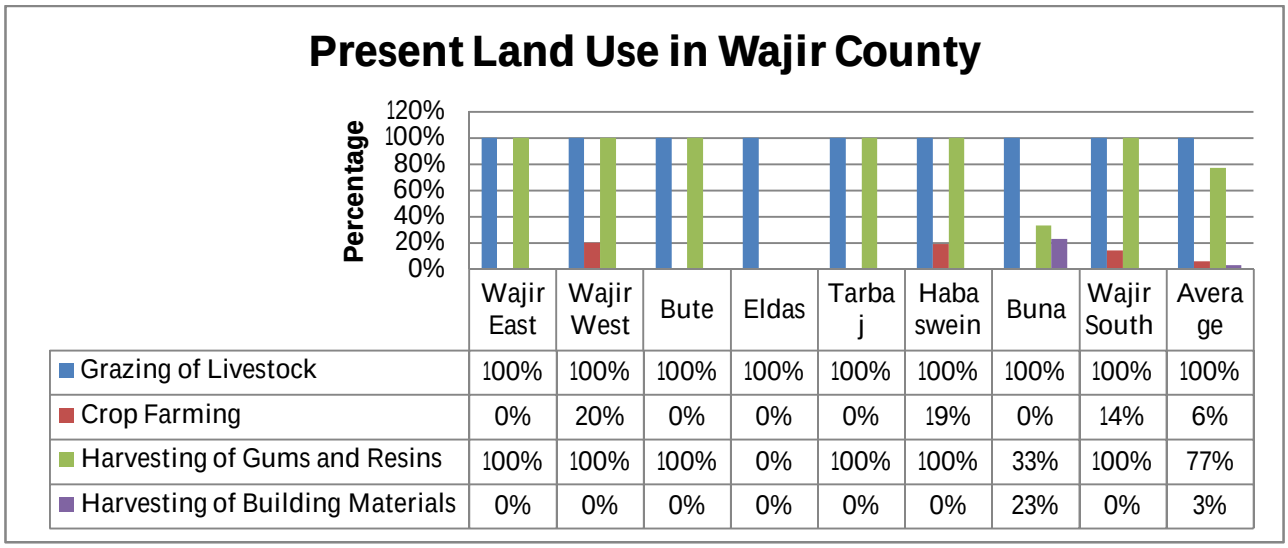


Figure 4: Mode of Land Acquisition

Present Land Use

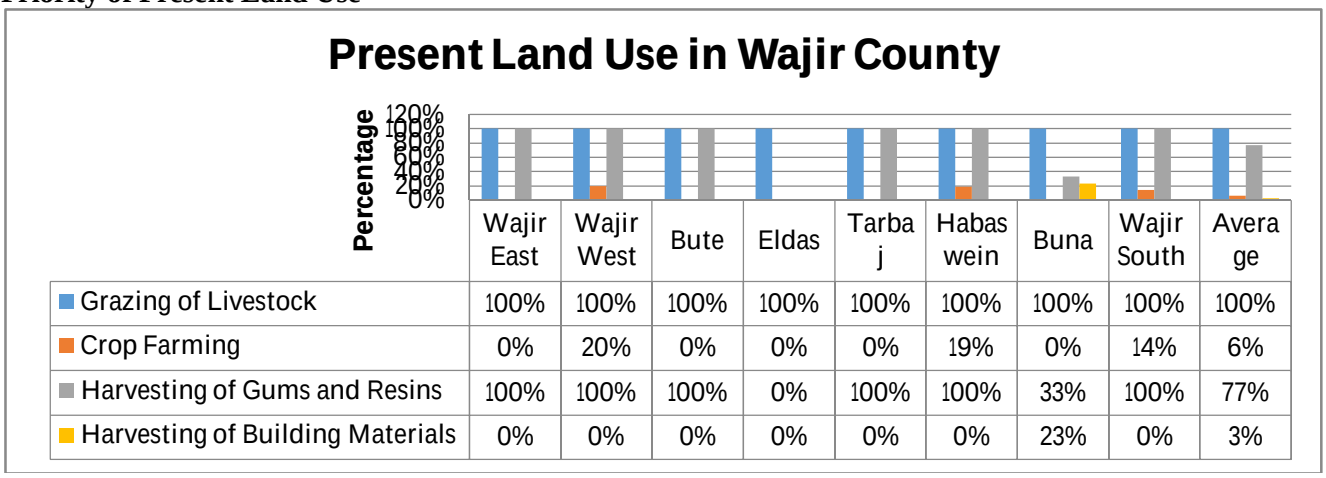


	Wajir East	Wajir West	Bute	Eldas	Tarbaj	Habaswein	Buna	Wajir South	Average
Grazing of Livestock	100%	100%	100%	100%	100%	100%	100%	100%	100%
Crop Farming	0%	20%	0%	0%	0%	19%	0%	14%	6%
Harvesting of Gums and Resins	100%	100%	100%	0%	100%	100%	33%	100%	77%
Harvesting of Building Materials	0%	0%	0%	0%	0%	0%	23%	0%	3%

Figure 5: Results of the Current and use Practices in Wajir County

On average, all the respondents (100%) in Wajir County, use the land primarily for livestock grazing, 6% for crop farming. In Wajir West, 20% of the respondents engage in horticultural crop production around shallow wells. Similarly, 19% and 14% of the respondents from Habaswein and Wajir South respectively indicated that their present land use was also on horticultural crops. In all the sub-counties the respondents reported the minimal yields in crops were due to failed rains. Averagely 77% of respondents reported harvesting of resins and gums while only 3% reported harvesting of building materials. Building materials were mainly harvested from Buna (23%) while none of the respondents from Eldas sub-county harvested gums and resins.

Priority of Present Land Use



	Wajir East	Wajir West	Bute	Eldas	Tarbaj	Habaswein	Buna	Wajir South	Average
Grazing of Livestock	100%	100%	100%	100%	100%	100%	100%	100%	100%
Crop Farming	0%	20%	0%	0%	0%	19%	0%	14%	6%
Harvesting of Gums and Resins	100%	100%	100%	0%	100%	100%	33%	100%	77%
Harvesting of Building Materials	0%	0%	0%	0%	0%	0%	23%	0%	3%

Figure 6: Present Land Uses in Wajir County

The respondent prioritized livestock keeping as the first land use followed by crop production, harvesting of gums/resins, harvesting of building materials and building of homesteads respectively.

Challenges on the Present Land Use

All the respondents confirmed that the challenges shown in the figure 7 below affect the current land use in the County, except in Buna sub-county where 53% indicated that high poverty levels affect land use and none of the respondents in Eldas indicated high levels of poverty as a challenge affecting land use. The community perceives a poor person as one who has no livestock, no spouse, no children and no source of income. The poor therefore are those persons who cannot meet their basic needs, such as adequate food and appropriate shelter. Poverty affects the capacity of people to produce and make decisions on land use, because poverty dis-empowers them. The challenge of illiteracy limits an individual's ability to access to information and technologies regarding land use.

Pest and diseases affect both livestock and crops thus reducing the productivity in the county. Wild animals predate on livestock, humans and also destroy crops in the county hence reducing productivity and contributing to increased poverty levels.

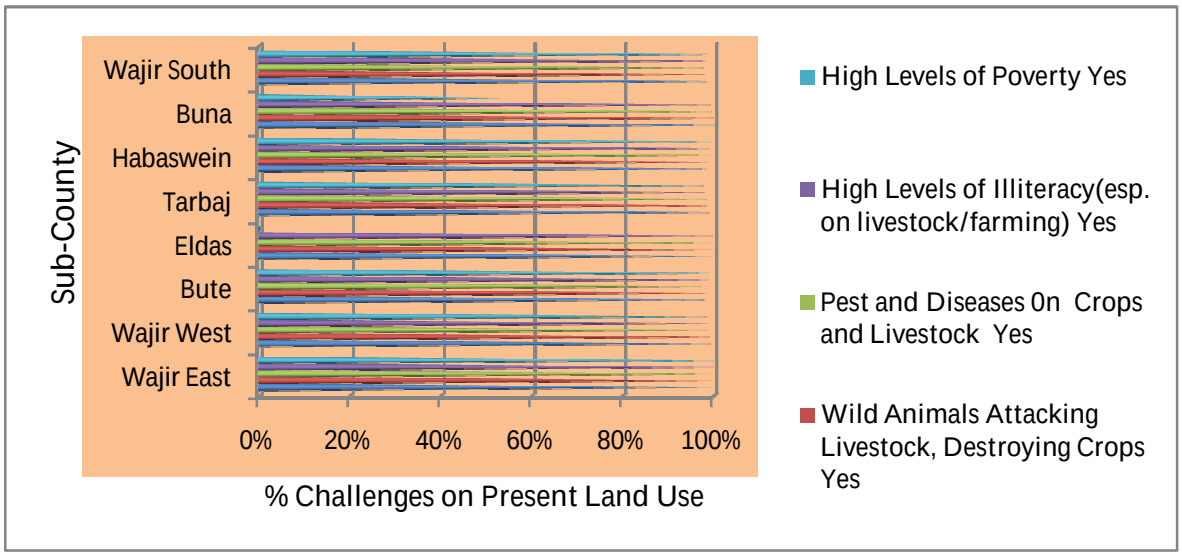


Figure 7: Challenges on the Present Land Used in Wajir County

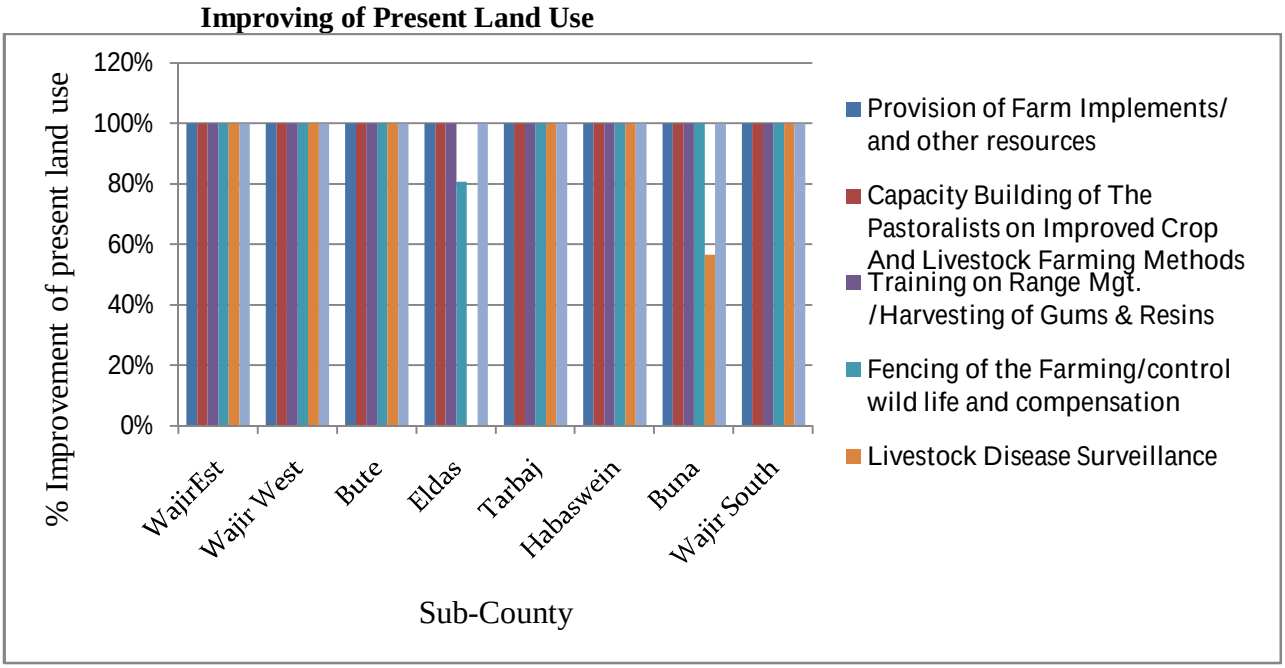


Figure 8:Improving of Present Land Use

Except in Eldas and Buna Sub-Counties, all the respondents in the other 6 sub-counties indicated that to improve the present land use and increase food security, there was need to provide farm inputs (implements, pesticides, fertilizers and other resources), capacity building of the pastoralists on improved crop and livestock farming methods, drilling of boreholes/construction of dams for irrigation. There was need also to offer training on range management, harvesting of gums and resins, fencing of the farm to control wildlife and compensation. Further there is need for livestock disease surveillance, reduction of settlements and conservation of environment. In Eldas sub-county, 81% supported fencing of the crop and pasture farms to control wildlife and compensation while in Buna sub-county, only 57% supported livestock disease surveillance.

Necessary Policy framework for Land Use Planning

Table 4: Necessary Policy Framework for Land Use Planning

Sub-County	Policy on Environment Protection		Policy on Employment of more Extension Officers	Policy on Peace Building to avoid Disputes/Conflict	Policy on Subsidizing Farm Inputs
	Strongly Agree	Agree	Strongly Agree	Strongly Agree	Strongly Agree
Wajir East	19	0	19	19	19
Wajir West	30	0	30	30	30
Bute	10	0	10	10	10
Eldas	30	1	31	31	31
Tarbaj	62	0	62	62	62
Habaswein	26	0	26	26	26
Buna	30	0	30	30	30
Wajir South	14	0	14	14	14
Totals	**221**	**1**	**222**	**222**	**222**

From the results in Table 4, there was general consensus across the 8 sub-counties on the need for the county government to take up the following policy issues in order to improve land use and planning in Wajir: Policy on environment protection; policy on settlement planning and water exploitation, policy on employment of more extension workers; Policy on peace building to avoid disputes/conflicts and policy on subsidizing farm inputs.

Conclusions

Knowledge Systems for Land Use Potential (KSLUP) in Wajir County provides a basis for the formulation of policies and programmes by relevant authorities and partners in to order improve land productivity in terms of livestock, crop and natural resources management. There were more males than female hence there is need to enhance equal roles for men and women to make decisions about land use. On age there is need to recognize the role of elders in land allocation and utilization. Education is crucial and hence there is need to promote better education to enable access to information about land use. On the levels of income from livestock and crops, there is need for policies that promote diversification to allow for better use of livestock and crops products and technologies. Invest in technology development for harvesting resins and gums.

On land ownership, there is need for better management of the communal lands to avoid incidences of land grabbing and legally recognizing private lands through land adjudication and registration. Likewise, there is need to invest in improved technologies that enhance livestock productivity such as disease surveillance, water harvesting, irrigation, range management. Policies that provide farmers with an enabling environment for the development of ASALs to promote livelihoods need to be created as well.

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