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Rehearsing indigenous knowledge and culture to adapt strategies to fight against recurrent drought: A Study on Pastoral Community in Harshin District, Somali Region, Ethiopia

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Abstract

Pastoralists are nature lovers and their livelihood mainly depends upon the products and productivity of domestic animals like cattle, camels, goats, sheep, and donkeys etc.Rehearsing indigenous knowledge and culture to adapt strategies for fighting against recurrent droughts is a touchy ethnic sentiments among pastoral community in Ethiopia in general and Harshin District (Woreda) in particular. Continuous droughts since two decades in this region have not only valued their indigenous knowledge to sustain in the foulest situation but also developed their cultural values that are seen through study. Harshin Districtin the Somali region is one of the districtswith large number of pastoral community suffers severely from recurrent droughts since last two decades and so. Recurrent droughts not only deteriorated the ecosystemsand livelihoodassets butalso jeopardized sustainable livelihoodspatterns of the pastoralists. To fight with these situationstheyhave been developing local adaptive strategies and indigenous mechanisms or strategies according to the changing environment and local conditions. Therefore, this study is an attempt to bring together various issues and challenges faced by the pastoral community due to recurrent droughts in the study area and finding lasting solutions through analyzing their adaptive strategies and copying mechanisms.

Key Words: Pastoralists, Nature Lovers, Livelihood, Rehearsing, Indigenous Knowledge

1.Introduction

1.1. Background

Pastoralists are nature lovers and their livelihood mainly depends upon the products and productivity of domestic animals like cattle, camels, goats, sheep, and donkeys etc.(see table 'B') The pastoralist does not exist either individually or in a homogenous group. The lonely herder wandering in the wilderness to find pasture and water for animals is a romanticized picture of the harsh living and survival conditions of pastoralists (Justin Ginnetti and Travis Franck,(2014)rather, pastoralists exist as individuals in communities that are often tribally affiliated, with partly different histories, different languages, and social and cultural values and ties, distinct struggles for power.(Justin Ginnetti and Travis Franck , (2014)

In the Horn of Africa, arid and semi-arid areas account for more than 60 percent of the total surface area with a pastoral population estimated between 12 million and 22 million people (World Bank, (2014).Ethiopia is a home for about 12-15 million pastoralists which reside in 61% of the nation's landmass (Müller-Mahn, et,al.(2010).District wise total fertility rates are shown (see Table 'A')

Table'A' District wise total fertility rates of pastoral

Region/districts	No. of districts	Total fertility rate		
		1979-88	1995-2000	2001-07
Ethiopia		-	CSA DHS(2000)	CSA DHS(2005)
Somali	44	n/a	5.7(2000)	6.0(2005)
Afar	29	n/a	4.9(2000)	4.9(2005)
Oromiya	34	n/a	6.4(2000)	6.2(2005)
Southern Nations, Nationalities and Peoples' Region	6	n/a	5.9(2000)	5.6(2005)
Gambella (Zone 1)	5	n/a	4.5(2000)	4.0(2005)
Benshangul -Gumuz	3	n/a	5.4(2000)	5.2(2005)
Dire Dawa	1	n/a	3.6(2000)	3.6(2005)
Average for the selected pastoral districts	-	-	5.2(2000)	5.0(2005)
Ethiopia national average	-	-	5.9(2000)	5.4(2005)

Source: Overseas Development Institute(Humanitarian Policy Group Report,(2010)

Drought is quite common in the pastoral areas of Ethiopia, which seem to translate into famines due to sole dependence on livestock production (Wassie & Fekadu, (2015). Synergic effect of inadequate infrastructure, poverty, inadequate health services, and lack of alternative means of income amplified the level of vulnerability of pastoral communities to drought (Herrero et al. (2016); Ayalew, (2012). These shows that pastoral livelihood is increasingly under pressure due to an expropriation of prime grazing land for investment and conservation.

Table 'B' Livestock holding patterns of pastoral community

Pastoral Area	Cattles	Sheeps	Goats	Camels	Equines
Afar	2,600000	2000400	3000300	920000	300000
Oromia(Borena)	1400500	1000700	500300	550000	40000
Oromia(other Area)	140000	205000	300050	10050	30000
Somali	5500000	5600000	3304000	1105000	360500
SNAP	470000	340400	5005000	800	40500
Benishangul&Gambella	100600	100200	102000	-	30000
Total	10,211,100	9,246,700	13,129,650	12,530,850	80,1000

Source: Primary data,(2020)

This has forced pastoralists to change theirlivelihood activities. Sileshi (2017) assessed the general livelihood vulnerability of pastoralists emphasizing drought and paid less attention to the communities‟ adaptive strategies to drought. Harshin Woredain the Somali region is one of the Woredaswith large number of pastoral community suffers severely from recurrent droughts since many years. Recurrent droughts not only deteriorates the ecosystem and livelihood assets but also jeopardize livelihoods of the pastoralists.

To fight with this situation they,themselves have been developing local adaptive strategies and indigenous mechanisms or strategies to the changing environmental conditions.
Therefore, the overall aim of the study is to understand the adaptive strategy of pastoralists to recurrent drought and other pressures and to innovative their indigenous knowledge to resistance the consequence drought in the study district

1.2 Statement of the Problem

Pastoralists in Ethiopia like other elsewhere in Africa are among the most socially, economically, politically and geographically marginalized groups (Hogg (1997). Different authors indicated that there is no smooth relationship between pastoralists and the Ethiopian government (Hogg (1997), Devereux(2010), and Muller-Mahn et al. (2010). The deeply disturbed relations between pastoralists and the state have their roots in a long history of governmental interventions and policies that failed to acknowledge pastoralist as a viable way of life (Devereux,(2010).
Pastoralists have high degree of exposure to climate change due to their location in vast arid and semi-arid areas all over the World, Africa and Ethiopia. Compared to highland areas, these areas are characterized by marked rainfall variability, fast return rate of drought cycles, and associated uncertainties in the spatial and temporal distribution of water resources and grazing for animals feeding (Conway and Schipper, (2010).
Furthermore, growing population growth, unresolved land tenure issues, poor market access, invasion of large scale state and private investment and all forms of the main political and socio-economic relegation make pastoralists more sensitive to the impacts of recurrent drought.
Despite this sense of determination and traditional adaptive techniques, pastoralists' ability to adapt is constrained by many factors including increasing land degradation; conflicts over scarce resources, which limit movement and destroy assets that are key for adaptation.
Harshin Woreda is predominantly pastoral area but without large-scale pastoral development interventions. The consequence drought is the real and major problem in HarshinWoreda.

Hence, this study initiated to address knowledge gap in drought and local adaptive strategies in the pastoralist context .

1.3. Research Questions

The basic research questions that have guided the research endeavor are as indicated below;

- What is the trend of recurrent drought and how pastoralists perceived it?
- What local adaptation strategies do pastoralists use to minimize the recurrent drought effects?
- What are the determinants of pastoralists' choice of adaptation strategies to the recurrent drought effects?

1.4.Specific objectives

- To assess perception of the pastoralists regarding the effects of the recurrent drought.
- To identify the adaptive strategies of pastoralists on changing environment due to recurrent drought.

1.5. Significance and scope of the study

This study provides information on the effective measures to be taken to assess the adaptive strategies of pastoralist on recurrent drought. In addition, the result of this research will be greatly helpful to development practitioners and policy makers for better understanding the about the pastoralist society.The research also tried to look at the appropriateness of development as well as emergency interventions in the study area in the pastoral context of Harshin Woreda in the view of the community

2 Theoretical Framework

2.1 Concepts and Definitions

2.2 .1 Pastoralism

Pastoralism is a way of life; it is a traditional land management and production system which, through its dynamic, flexible and complex structure, has proved to be the most adapted to changing environmental conditions (Hartmann, Sugulle, &Awale, (2009). Pastoralist is defined as the "unsettled and non-commercial husbandry of domestic animals" (Dula, (2013).

Though pastoralists depend on livestock production, they are not entirely homogenous (Wako et al., (2017). Mobility is a key feature qualifying pastoralist. The term nomadic is used when mobility is high and tray for the rest (Rota, (2009).Pastoralists are people who live mostly in dry, remote areas (Hartmann et al., (2009). Pastoralists inhabit zones where the potential for crop cultivation is limited due to low and highly variable rainfall conditions, steep terrain or extreme temperatures (Herrero et al., (2016).Their livelihoods depend on their intimate knowledge of the surrounding ecosystem and the well-being of their livestock (Rota, (2009). The types of livestock kept by pastoralists vary according to climate, environment, water and other natural resources, and geographical area.Pastoralists have developed successful mechanisms of adaptation to maintain an ecological balance between themselves and the natural environment (Wassie & Fekadu, (2015).

Pastoralist is therefore, an economic and social system well adapted to dry land conditions and characterized by a complex set of practices and knowledge that has permitted the maintenance of a sustainable equilibrium among pastures, livestock, and people (Okoti et al., (2014); Rota, (2009).According to UNDP (2003), Pastoralist is an economic system in which most household gain more than 50 percent of total gross household income (i.e. including the value of products produced and consumed within the household) from livestock related activities, using unimproved pasture. And systems where more than 25 percent of income comes from livestock, more than 50 percent from cropping is labeled as agro-Pastoralist.

2.2. Drought and its Impact

Droughts are usually upsetting the delicate balance on which the pastoral production system depends (Galma et al., (2017). Drought affects the living of pastoralist in different ways. Among the effects of drought are the following: drying of many sources of water, a manifestation of diseases, loss of pasture, increased mortality of livestock, loss of land to agricultural encroachment as the rise in rainfall raises the productive potential of the dry land and further migration to places occupied by other pastoralists (Zelalem, Aynalem&Guernebleich,(2009); Okoti et al., (2014). Increasing rainfall variability affects rangeland productivity. This may have significant negative effects on herd dynamics, stocking density and the productivity of pastoral production system (Herrero et al., (2016). Mobility due to drought pushes them to end up in geographical conflict with other pastoralists (Okoti et al., (2014).

According to Lekapana (2013), drought is considered the most complex but least understood kind of natural hazards, affecting a huge number of people than any other form of disaster. This not only affects the short-term food security situation but it also compromises the future of pastoralists by eroding their livelihood base (Gutu, Bezabih, &Mengistu, (2012).

2.3. **The adaptive strategies Pastoralist**

Adaptation is about reducing the risks posed by climate change to people's lives and livelihoods. It involves adjustments people employ to lessen the impacts of climate change on humans and to the environment (Okoti et al., (2014). Available evidence shows that adaptation strategies pursued by pastoralists involve, among others, herd diversification, increasing mobility, livelihood diversification, and increasing drought-tolerant livestock (Mworia&Kinyamario, (2008);Ayele, (2016). However, not all adaptation strategies are available for all pastoral communities (Mworia&Kinyamario, (2008). For instance, in addition to livestock rearing, in the current years, particularly up to 2011s onwards, the Harshin have also begun to practice small scale farming and charcoal production as the response to the scarcity of their former vast grazing land and for the declining of their pastoral means of livelihood (Ayalew,(2012); Ayele, (2016).

Pastoralists in many parts of the globe depending on different stages of drought practice different adaptive strategies (Huho et al., (2011); these survival and preservation mechanisms assist in safeguarding the continuity of livelihoods. UNDP (2011) study suggests that some of the common mechanisms utilized by local population in assessing own drought do include reduction in number of animals, frequent animal sell for food purchase, decline in water production from the wells, Imbalance between livestock numbers and available wells, livestock numbers dwindle through mortalities with conditions of livestock becoming worse.The traditional strengths of African Pastoralist appear to be in decline. There is concern that drought, population growth, territorial contraction, and inappropriate development interventions are leading to the breakdown of traditional systems. This can lead to increased poverty among the poor, greater vulnerability to future climatic and economic crises, and accelerated resource degradations that may ultimately compromise the long- term sustainability of Pastoralist as a way of life (Patrick, (1994).

Economically, pastoralist was performing well in these areas, and livestock sourced from pastoralists dominated some domestic and export markets. Therefore, in contrast to the common perception at policy levels of pastoralist as an unproductive subsistence system, there were many examples of pastoral livestock production and marketing arrangements that outperformed agricultural and settled livestock producers (Scoones(1995).

Recent efforts to reduce drought-related humanitarian assistance in pastoralist areas of Ethiopia and Kenya include large-scale government safety-net programmers, involving regular transfers of cash (Kenya, Uganda) or food (Ethiopia) to vulnerable households, with international aid donors covering most of the costs. In Uganda's Karamoja region, a consortium of agencies has implemented labor-intensive.Therefore, to cope up

with change in the development thinking of Pastoralist more social studies on the livelihoods and indigenous mechanisms of adapting to changes on their environments are highly needed. Accordingly, Social scientists among others, are beginning to understand how customary institutions work. The purpose of this study is hence to fill gap in knowledge in the pastoral community of Harshin Woreda on their adaptive strategies to recurrent drought.

3. Research Methodology:

3.1. Study Area

Harshin District(Woreda)is one of the eleven districtof Fafen Zone in the northern part of The Ethiopia Somali Regional State. The woredais located and bounded between 8° 27' 11.0187" N to 10° 01' 40.170 North and "N" and 41° 40'13.6557" E to 45° 32' 35.7129" East. It covers a total area of 1,315.1 km2 and is bordered by Kebribayahworedain the west, Somaliland to the north, east, and Aware and Degahburworedas to the east and south respectively. Harshin town is about 120 km from Jigjiga.(CSA ,(2007)

3.2. Demography:

Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia (CSA), this woreda has a total population of 80,244, of whom 43,869 are men and 36,375 women. While 8,226 or 10.25% are urban inhabitants, a further 39,275 or 48.95% are pastoralists. 99.39% of the population said they were Muslim (CSA (2007) .This woreda is primarily inhabited by the SacadMuuse sub-clan of the HabrAwal(UNDP)Emergencies Unit for Ethiopia report, dated 30 May 1998)

3.3.Research Design

The study adopted descriptive research design. The descriptive research design selected with the assumption that will be helpful to obtain relevant information from concerned respondents on the, assessing the adaptive strategy of pastoralist to recurrent drought in Harshin woreda in Somali regional state and to gain detailed data from large number of respondents to draw the necessary conclusion.

3.4. Methodology:

The study area was selected purposively. This study used mixed methods (Quantitative and Qualitative techniques)

3.5.Data Sources and Collection Method

Primary and secondary sources were used to collect both qualitative and quantitative data.

To obtain information on recurrent drought in Harshin district, primary datas were collected through semi structured interview, questionnaires, observation and focus group discussion. Each respondents' were informed about the purpose of this study. Each respondent was given at least ten minutes for discussion and answering the questions, at the other hand the respondents were observed about their habits, culture and how they share the information very keenly using non participatory method and proportionate respondents were also used for focus group discussion, mainly at evening time, the discussion took place for about one hour duration.

In addition to this, key informants' interviews were carried out to generate information. On the other hand, secondary datas collected from books, journals, maps, reports and other research publications.

3.6. Sample size Sampling Method

In this study Harshin woredas wasselected purposively, out of twenty one kebeles only three kebeles namely Lankeyrta, Farah liban and Aran'are randomly selected and using Yamane (1967) total sample size (175) selected and proportionately distributed among kebeles.

3.7. Data Analysis Method

Datas so collected were edited, coded-decoded , tabulated , processed for analyses using statistical tools accordingly inferences are drawn conclusion and recommendations are made.

4.Discussion.

Ethiopia, like many African countries, is vulnerable to climate change. The country's economy heavily relies upon the agricultural sector. This vulnerability has been demonstrated by the devastating effects of the various prolonged droughts in the 20th century and recent flooding. About 12% of Ethiopia's people are pastoralists (CSA, (2008), herding their livestock in the arid and semi-arid lowlands that constitute about 63% of the country's land mass (MoARD, (2008). These areas are prone to rainfall variability, extreme drought and flash floods. Recent studies point to dry land populations as the most ecologically, socially, and politically marginalized lagging behind on most economic and health indices and that climate change will be yet another stress factor in a vulnerable system (Verchot*et al*., (2007) because of their geographic exposure, low incomes, greater reliance on climate sensitive sectors, and weaker capacity to adapt (Schelling,(1992).Moreover, it is argued that the value of local knowledge drought impact studies has received little attention. Therefore, understanding pastoralist's response to recurrent drought is crucial in designing appropriate supportive policy to adaptation strategies of climate change for many poor pastoralists that are highly vulnerable to the adverse effects of climate change. Studies also concluded that adaptation options are location specific and policy for adaptation options should be agro ecology specific.

4.1.Situational Analysis

Livestock constitute a major economic factor in the pastoral communitiesin Harshin Woreda. More precisely, in the study area, livestock are a depository for savings, a reserve for contingencies, a self-reproducing asset, a source of subsistence and current income, and a source of energy for farm. Livestock play also a central role in determining the wealth and social status of pastoralists. In addition to all these, livestock support intensification on the farm (through the cycling of nutrients through crop residues and manure).

The importance of livestock for subsistence, as a source of cash and as a store of wealth, is contingent upon the number and types of animals owned and the availability of feed and water, and the owners' management skills. Comparing both production systems, agro-pastoralists keep large proportion of grazers compared to pastoralists, whereas pastoralists keep more browsers than grazers. This proves the environmental condition provides different options for varied production systems. However, the key informants put this as not being a fixed production strategy as local practices and preferences largely rely on environmental conditions. We generally observed a structurally-induced and supply-induced scarcity of grazing resources between and within ethnic groups respectively. This is following the arguments of Homer-Dixon (1994) who made a profound contribution to the concept linking conflict on common-pool resource use and scarcity of environmental resources. Supply-induced scarcity is caused when the available resource is declining in quantity due to shortage of rainfall and structurally- induced scarcity exists when movement of groups is limited due to insecurity. We have observed both situations in our study since different clans hold different property rights to specific resource -primary and secondary access rights-whereby secondary access rights are usually conditional.

4.2.Local and Scientific Weather Knowledge

In Agrarian Practices local farmer's ability to make informed decisions is largely governed by personal experiences acquired over the years. In the absence of credible scientific weather information systems to farmers, they must resort to what is at their disposal. Even when scientific weather systems are broadcast on the media, it appears hard to be understood by rural farmers because of low levels of formal education (seeTable C&D)).

Table 'C' Prediction of drought through traditional (Local)and conventional(Scientific) knowledge

Traditional			**Conventional**		
Elements	**Frequency**	**Percentage**	**Elements**	**Frequency**	**Percentage**
Personal Perceptions	60	34.28	Television	20	11.42
Animal Behaviour	15	8.57	Radio	60	34.28
Village Tomtom Bell	40	22.85	Newspaper	0	-
Plant Behavior	05	2.85	Other Means	10	5.71
Sound of Birds /Insects	20	11.42	-	-	-
Through gathering Clouds	30	17.14	-	-	-
Through certain Sun Moon and Stars signs	35	20.00	-	-	-

Source:Primary data

Local weather knowledge is simple to understand than conventional scientific knowledge. Both local and scientific knowledge in weather forecasting over the years are produced through observation, experimentation, and validation. Scientific knowledge in weather reading follows certain procedures in its production process, but local knowledge is unregulated and haphazard or unorganized by oral tradition. Local knowledge in weather prediction does not require sophisticated tools. Formal education or training is not needed to acquire skills in local weather forecasting. Exercising local knowledge in weather prediction requires no financial investments. Despite yawning differences, scientific weather forecasting and local predictions are mutually exclusive. Local approaches to weather prediction are often accurate and as such are the best in making the right decisions in farming activities.

Table 'D' The adaptive strategy of pastoralist

Access to information about drought	No Adaptation	Chang herd composition	Herd splinting	Migration	Feed Preservation	water harvesting	Total&Percent
No	8	15	3	12	30	15	83(47.42%)

Yes	6	28	24	17	13	4	92(52.57%)
Total	14	43	27	29	43	19	175(100%)

Source: Primary data, 2020, N=175

*** is Significant at 1% probability level respectively χ^2 0.254***

Local knowledge in weather reading entails a great measure of spirituality. Indigenous peoples are among the first to face the direct consequences of climate change due to their dependence on and close relationship with the environment and its resources. Traditional environmental knowledge has an advantage of being directly linked to household daily activities. It is concerned with the immediate necessities of people's daily livelihoods and can provide a short-term and immediate solution to a means of survival in the community, making it meaningful.

4.3.Stages of Drought and Features:-

Drought may occur in various types in an affected year. As pastoralists discussed about stages and features of drought in a various ways (see Table ' E')

Table'E' Various stages and features of drought

Types	Features	Year
Mild	Konailu(October-December). Usually rainy seasons Kerma (July-September) but late start of rain and early cessation	1994 but stayed for less time
Average	Partial rains in a year	1993-94 even people could not move out from local areas
Acute	Mostly No rain during Kerma (July-September)	1982-85, 2002-03, 2005-06. Now this year also it is predicted in some places for acute drought

Source:Primary Data

4.4.Movement of Animals and People

The availability of feed and water determines the livestock population. High livestock population leads to reduction in feed supply, resulting in livestock mortality. With such situation and recurrent droughts, pastoral livelihood is increasingly becoming vulnerable to impoverishment and famine. The pastoralists move their animals seasonally in search of better sources of feed and water. This system of seasonal movement allows the herd owners to utilize the available resources in a rotational manner and enables the

vegetation on grazing lands to regenerate. Moreover, the seasonal migration reduces the concentration of livestock on a fixed pastureland for a longer period and thereby averts the risk of overgrazing. In both production systems, the head of the household makes the decision where and when to migrate. In wet season animals were trekked over short distance (to the near by areas) whereas in the long dry months when drought is widespread over a large area, local movements are not dependable. Consequently, herd owners would be forced to take their animals farther. This was often reported to have led to conflict with other communities

4.5Diversification of species:

Particular species of livestock will face different risks from disease, grazing scarcity, etc. By maintaining several species, herders can reduce the risk they face from any particular event. In addition, a mixed herd can make fuller use of an area of grazing than a single species alone. According to World Bank managing a variety of species helps to take optimal advantage of the heterogeneous nature of ecosystems. The pastoral strategy is to use a broad array of species (cattle, camels, sheep and goats), which utilize different parts of the forage and have varying resistances to drought

Mace and Houston (1989) predict that in order to maximize household survival chances, poor households should keep only small stock. But after the total herd size increases to a certain level, it becomes beneficial to exchange many, if not most, of the small stock for camels. The herd size at which the switch to mixed camel and small stock herding becomes optimal is shown to depend on, beside the local environmental parameters, the household's food and income needs and the contribution that an animal of each species makes towards meeting those needs, and it generally occurs well above the minimum wealth at which one camel could theoretically be bought. The proportion of the household's livestock wealth that should be kept in camel after this 'up-stocking' into camels is shown to depend on type drought susceptibility of each species, but particularly small stock, and also on their relative prices or exchange rate. These predictions are based on the assumption that herders actively manage the species composition of their holdings, either by exchanging species directly or preferentially selling or slaughtering one species more than another when providing for household needs (Mace and Houston (1989).

Herd splitting and distribution/exchange: In this case, animals may be kept in several different areas, which given the common occurrence of local droughts, will reduce the impact of this on 'total holdings. This involves dividing their livestock into small herds grazed separately and by prioritizing milk animals or some other category. In addition, animals may be distributed through loans and exchanges with other herders reducing the effects of localized droughts, raids and diseases on stock and at the same time creating and re-enforcing social ties between households. However, this is rapidly changing, as livestock are becoming more marketable and family labor is being replaced by wage labor (Oba (1990).

4.6.Reduction of food intake and change of composition of diet:

The immediate impact of drought is decline of the supply of milk, which is the most important source of calories in the pastoral areas. During the drought pastoralists take more cereals than milk and reduce their food intake. According to Coppock (1994) during the 1983-86-hunger period, pastoralists in the Borena area compensated for reduced food production through four ways and three of them are related to household diet adjustment. These are: (i) giving priority to young children to receive milk; (ii) shifting diet composition for other age groups to include more cereals, meat and blood to accommodate the needs of children; and (iii) reducing the size and frequency of meals to adults and older youths. 'It was also observed that in some instances households gather wild foods (Futterknecht (1996).

5. Conclusion and Recommendations

In reality, many research studies concluded that climate change is increasing and will increase in future. In response to these harsh conditions farm community were used indigenous climate change adaption strategies. Indigenous adaption strategies were contributed for providing solution/remedy for the changing environment in their working environment. These indigenous adaption strategies were essential for understanding either local or worldwide impacts of climate change on socioeconomic, political and environmental development/ wellbeing of the people.

The results of study reveal that sample respondents utilize different indigenous adaption strategies. Surface and ground water quality, ice, declining trends of grazing land, biodiversity and forest coverage change. The study result revealed that there are no best practices that canbe used to tackle all climate change variables. Using a blend of the indigenous adaption strategies across the appropriate contexts is, therefore, of paramount importance.

The major and most frequently used indigenous adaption strategies to climate change by the pastoralists is to adjust livestock management, livestock integration, and reserving and consolidating social interaction are important adaptation strategies to climate change.

Therefore, it is imperative to strengthen their adaptive strategies and incorporating scientific strategies through development and implementation of appropriate policies and strategies. To this end, the following recommendations are made to tackle climate change hazards besides understanding protectionthrough enhancing the application of indigenous adaption strategies, which is appropriate for socioeconomic, political and environmental development of the community.

Recommendations

- To develop a sustainable approach linked with local –regional and central governments to increasing adaptive capacity and resilience
- To bring different stakeholders in order to make appropriate decision during need hours.
- To develop certain platform where pastoralists can share their experiences, knowledge, information and skills between communities, sectors, formal and customary institutions.
- To develop awareness campaign to educate the people how to handle the catastrophic situations using resources optimally.
- Intra drought and post-drought management issues need to be understood better in order to identify the gaps in action during drought and post drought, therefore, further research is appreciable in context of the study area for better policy option
- Short-term and long-term options to use optimally the natural resources may be open to each pastoral society in order to enhance indigenous capacity building and developing copying mechanisms.
- To focus more on employment diversification and long-term transformation approaches to different households taking into account their socio-economic background.
- To strengthen the institution's pillars in order perform the role of institutions effectively in the pre-post drought era.

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