

Determinants of Pastoralists Livelihoods Diversification in Ethiopia: A Literature Review

Tesfaye Tura^{*}, Tsion Tekalegni

Ethiopian Institute of Agricultural Research (EIAR), Werer Agricultural Research Centre, Werer, Ethiopia

Email address:

tesfishanni1599@gmail.com (Tesfaye Tura)

^{*}Corresponding author

To cite this article:

Tesfaye Tura, Tsion Tekalegni. Determinants of Pastoralists Livelihoods Diversification in Ethiopia: A Literature Review. *Journal of Business and Economic Development*. Vol. 8, No. 3, 2023, pp. 77-82. doi: 10.11648/j.jbed.20230803.11

Received: November 23, 2022; **Accepted:** January 9, 2023; **Published:** August 10, 2023

Abstract: Pastoral is a livelihood in which at least 50% of a household's food income is derived from livestock. In Ethiopia the pastorals represent 10% of the all populations and which they hold 42% of the livestock populations of the country. The livestock contribute 16% and 33% for National and Agricultural sector GDP respectively. Despite its contribution for the sector development specifically and the country in general, Ethiopian, pastoralist livelihoods are increasingly under pressure. Policies have favoured externally imposed development schemes which often alienate and expropriate pastoral lands in favour of large-scale commercial activities. This reviewed paper focus is to assess the push and pull factors for pastorals livelihood diversification in Ethiopia. Pastoralist livelihood systems of a country are become increasingly vulnerable due to resource range land degradation, diminishing resilience against drought, population growth, break up of traditional governance system; lack of market linkage, least developed of veterinary services, and water sources both for human and livestock and rural finance. These factors are push factors for pastorals livelihood diversification in Ethiopia. On the other hand, Expansion of education, infrastructure, and expansion of on-farm employment opportunities and strengths of market linkage are the pull factors for livelihood diversification. The government and others development practitioners should encourage the livelihood diversification of pastoral households and support with the area-specific policy and strategies to ensure the development of pastoral households in the country.

Keywords: Ethiopia, Factors, Determinants, Diversification, Pastorals

1. Introduction

Pastoralists represent approximately 10% of the Ethiopian population (over 72 million, and approximately 40% of the land area of Ethiopia is considered to be under pastoral production system [1]. The majority of pastoralists constitute the ethnic groups of the Somali (accounting 57%), the Afar (26%), the Oromo of Borana and Karrayu (10%), while the remaining 7% of Ethiopian pastoralists inhabit the lowlands of the Southern Nations Nationalities and People's Regional State (SNNPRS) and Gambella regions [2]. Pastoral areas are estimated to comprise 42% of the national total livestock population. Livestock and livestock products provide about 12-17% of Ethiopia's foreign exchange earnings, out of which hides and skins contribute about 90%. It contributes about 33% to the agricultural GDP and 16% to the national

GDP. In East Africa in general and Ethiopia in particular, where pastoralism is significant, a combination of several factors is driving many pastoralists into non livestock-based livelihood strategies.

Similar to other sub Saharan countries the Ethiopian pastoralists have been subjected to political marginalization [3, 4]. Policies have favoured externally imposed development schemes which often alienate and expropriate pastoral lands in favour of large-scale commercial activities. In the pastoral areas, the mainstay of the economy is livestock (camel, cows/calves, and shoats) and contributes about 90% of hard currency generated from live animal export of the country. In the country, pastoralist livelihoods are increasingly under pressure and caught in a downward

spiral of resource depletion, and diminishing resilience against drought [5]; loss of livestock and shrinking rangelands [6]; break up of traditional governance; lack of market linkage, education, public health, veterinary services, and water both for human and for livestock and rural finance are the least developed [4].

In Ethiopia pastoralist livelihoods systems are becoming increasingly vulnerable due to the above mentioned reasons. Hence, Livelihood diversification is the key strategy assisting pastoralists to become less dependent on livestock as their sole household assets and income generating activity [7].

According to [8], one or more of the following characterize the challenges that the population in the pastoral areas of Ethiopia faces:

- 1) Loss of productive assets (livestock/farming/irrigated land) due to drought, floods, disease and livestock theft.
- 2) Declining sustainability as livestock holdings decrease and the human population grows.
- 3) Declining livestock and agricultural productivity due to poor husbandry practices and technologies.
- 4) Environmental degradation and deterioration of natural resources to the point that production may decline below recovery levels.
- 5) Breakdown of traditional institutions and social relations.
- 6) Inability to access markets and achieves maximum prices for livestock products.
- 7) Low socio-economic empowerment of women and youth.
- 8) Geographical isolation in terms of infrastructure, communications and basic services.
- 9) Increasing impoverishment of communities and households.

At the country and Africa level [9-12], have reviewed Assessment of Rural livelihood diversification in sub-Saharan Africa, Rural livelihood diversification among the smallholder farmers in some Africa countries, Income diversification and food security situation in Ethiopia and Review on livelihood diversification and food security situations in Ethiopia, respectively. Currently, diversifying livelihood activities is a common phenomenon in Ethiopia. Pastoral households engage and pursue diverse non-farm livelihood activities to cope with diverse challenges and risks such as drought. However, as far as the author's knowledge is concerned, there was no single review conducted on the title "Pastorals livelihood diversification strategies" at the country level. The current reviewed papers either focused on smallholder farm households without specific attention to pastoral households or assume pastorals living systems as sedentary farming. Hence, this paper aimed to review the contemporary papers on Motives of Pastoral Livelihoods Diversification in Ethiopia to overcome vulnerability context with *specific objectives of*:-

- 1) To assess the motives of pastorals livelihood diversification in the country,
- 2) To explore the contemporary factors determine pastorals livelihood diversification in the country.

2. Key Concept Definitions

Pastoralism: - Pastoralism is defined as a production system in which people generate economic, social and cultural utilities from livestock that are herded using forage and water availability as indicators to decide upon the timing of herd movements. There is no standard definition of pastoralism and agro pastoralism.

Pastoral is a livelihood in which at least 50% of a household's food income is derived from livestock. Pastorals are a group of people pursuing on rearing animals mainly of camel, small ruminants and cattle. They use natural grazing through extensive mobility in search of animal feed and water.

A livelihood comprises the capabilities, assets (including both material and social resources) and activities for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks maintain or enhance its capabilities and assets, while not undermining the natural resource base.

Livelihoods diversification is the process by which households constructs a diverse portfolio of activities and social support capabilities in order to maintain or improve their abilities to make living.

Pastoral livelihood diversification is "the pursuit of any non-pastoral income earning activity, whether in rural or urban areas". Which includes:- i) any form of trading occupation (e.g., selling milk, firewood, animals, or other products); ii) wage employment, both local and outside the area, including working as a hired herder, farm worker, and migrant labourer; (iii) retail shop activities; iv) rental property ownership and sales; (v) gathering and selling wild products (e.g., gum Arabica, firewood, or medicinal plants); and vi) farming (both for subsistence and cash income) [13].

3. Literature Review

3.1. Push and Pull Factors for Pastorals Livelihood Diversification

A number of scholars have confirmed that pastoralist in East Africa and other pastoralist areas do not normally specialize in livestock, crop or fish production to the total exclusion of other income generating activities. Rather, a majority of pastoralists have diversified their productive activities to cope up with various stresses and shocks. Motivations for such diversification are multifarious, linked with wide range of possible activities, and associated with both pushing and pulling factors.

3.1.1. Push Factors for Pastorals Livelihood Diversification

The current pastoral system was perceived to be threatened by extremely severe changes, including a decline in livestock holding per household, expansion of crop cultivation and degradation of rangelands [14]. The land in the pastoral community is fragile due to continuous communal grazing for longer time, and it is less productive to continue pastoral livelihood practice as usual. The livestock productivity

declining enables the pastoral households to clearly understand as livestock alone could not support their livelihoods. Generally, the climate change (drought), Population growth, range land degradation, taking grazing land for investment, Conflict and expansion of farm activities at arid and semi-arid areas of the country are push factors that exacerbate the pastoralists living system and cause for pastoralists livelihood diversification. The poor people in pastoral and agro-pastoral areas were engaged in diverse activities because of pushing factors. These factors are also known as necessity factors in rural smallholders livelihood diversification literatures. Here below the points are discussed one by one.

Climate change: climate change and the livelihoods of pastoralists are interlinked. Climate change severely affects the livelihood of pastoralists because they depend heavily on livestock, which in turn depends on forage and water. Changes in rainfall patterns will likely affect the quantity and quality of water available for livestock consumption [15]. This would affect livestock health, with potential impacts on the quality of meat and milk. Erratic weather patterns could also render livestock more vulnerable to diseases. Variability in weather patterns as a result of climate change has major implications for pastoralist livelihoods security in general. Pastoralists live in hostile and arid environments which are prone to frequent droughts. The effects of climate change and its impact on pastoral communities are now more conspicuous than ever with evidence pointing to increasing levels of migration and conflicts over scarce resources [16].

Population growth: The population growth resulting from high fertility rates cause for declining in farm size (especially common pasture) [9, 17]. Decrease in range land coupled with range land degradation enforces the pastoralists households to diversify their income sources. Shrinking farm sizes and growing landlessness are by default pushing unskilled farm labour into mainly low-return nonfarm sector.

Range land degradation: In pastoral and agro pastoral areas, the stock of natural resources particularly grazing lands, water sources and forest are shrinking from time to time as a result of many factors, including the occurrence of prolonged drought, high temperature, rainfall variability, environmental degradation [6, 18, 19]. Livestock holdings per household will continue to decline as the rates of rangeland degradation exceed the carrying capacity of grazing lands to support the existing livestock population. As the land in the pastoral community is fragile due to continuous communal grazing for longer time, it is less productive to continue pastoral livelihood practice as usual. Therefore, the range land degradation pushes pastoralists to shift or diversify their activities to sustain their living.

Taking grazing land for investment: changes in the land-use pattern will likely continue due to both external and internal pressures on rangeland. 'Land grabs' local and external investment in land are undermining access to critical pastoralist resources and increasing vulnerability [20]. Privatization of rangeland and transfer of communal grazing land to more beneficial land-uses has changed the traditional

land use patterns and significantly altered land rights [18]. The expansion of large-scale irrigation agriculture is happening as the government intervenes to substitute import wheat with country production. In the past decade, the most valuable pastoral lands have become subject to large-scale agricultural investment in the country, resulting in the loss or fragmentation of rangelands [21], induced sedentarization of pastoralists, and a radical reduction in livestock numbers. Where the richest rangeland areas are withdrawn from the store of resources accessed by pastoralists for dry season grazing, in favour of cultivation, the overall productivity of the land may even decline, pastoralists having little say regarding alternative land uses.

Conflict: Scarcity of key natural resources (pasture land, water sources and forest), increase the competition for these resources among the pastoralists. When pastoral groups compete to maximize their share of the limited grazing resources and water points [22], the struggle inevitably leads to conflict. Such type of conflict determines the livelihoods of pastoral. On the other hand, drought periods are positively correlated with increased incidences of ethnic conflicts over stiff competition for water and pasture, which sometimes extends across borders.

3.1.2. Pull Factors for Pastoralists Livelihood Diversification

Pull factors are positive and these may attract households to pursue additional livelihood activities to improve their living standards. These factors provide incentives for people to expand their range of income activities outside farming by increasing the returns from nonfarm activities.

Education Expansion: an elite commercial closing their connections with the 'margins'. An increase in education levels [20, 22] will mean that pastoralists will achieve better skills and be able to access better paying jobs; and they will participate more fully in civic activities and the democracy is emerging within pastoral societies, well connected economically and politically at the centre, often tie process by lobbying for improved policies and programs for their communities.

Emergence of improved on-farm labour market opportunities: The expansions of large scale irrigation farming create job opportunity for pastoral youth. For instances some are engaged in irrigated agriculture themselves in order to protect their land from being taken over by others [21]. Yet others found work as labourers, something which is often advertised as an advantage by planners who stress that local people may find employment on development schemes. A large number of pastoral "drop-outs" are leaving the pastoral system every year, well-prepared for a change in livelihoods [23]. Borana and Shinile zones may see an increase in the number of pastoralist drop-outs in the future, as communities explore and increasingly engage in other income-generating activities that are less sensitive to climate hazards [24].

Better market access: Due to the fact that individuals who live near the market area had higher opportunity to engage in other livelihood option beyond their usual pastoral activities.

It creates opportunities like wage labourer and petty trades, and market brokering [25]. In another way pastorals get fair price for livestock and livestock products might turn to invest on others activities.

Improved infrastructure: Location of the household is another determinant factor for livelihood diversification. Pastorals households nearest to the main road exercise the trading activity. The improvements in hardware infrastructure boost and create an opportunity to diversify their income sources for pastorals households [26].

3.2. Determinants of Pastoralists Livelihoods Diversification

Livelihood diversifications in Africa in general and in Ethiopia in particular attribute to the failure of the structural adjustment programmes in the 1980s and the 1990s to improve the economic conditions for agriculture [27]. For many institutional, infrastructural, technological, and informational reasons, financial markets are routinely incomplete in rural Africa, so individuals must act outside of financial markets in order to reduce consumption variability driven by real income variability. When crops fail or livestock die, households must reallocate labour to non-farm diversification pursuits, whether formal employment off-farm (e.g. wage labour), informal employment off-farm (e.g. hunting) or non-agricultural activities on-farm (e.g. weaving, brewing).

In Ethiopia, the complex inter-linkages among poverty,

population pressure, institutional failure and environmental degradation cause shrinkage of land holdings that led to farm fragmentation, landlessness and expansion of farming to steeper and marginal lands. These problems more devastating the livelihoods of poor farm households settled in drought affected area (especially pastorals). Other finding revealed that age structure of household head, agricultural inputs supply, a number of veterinary extension service contact dates, remittance and livestock holding size were significantly affecting the farmers' choice of different livelihoods [28].

Age structure of household heads was found to be negatively and significantly affecting pastoralists' livelihood diversification. The explanation for this result is that younger pastoralist households do not have enough livestock herds and resources that support their livelihood compared to the older farm households. So, the younger pastoral households are more likely diversify to non-pastorals activities than the older one [29].

Similarly the same Authors finding revealed that, pastoralists who use agricultural inputs (veterinary services and animal feeds) are more likely and significantly employing of-farm and nonfarm activities in addition to their pastoralism practices. Application of multiple options of livelihood can increase earning incomes and enables pastoralists to purchase and use better livestock technologies.

Table 1. Determinants of pastorals livelihoods diversification.

Study area	Determinants of pastorals livelihood diversification	Model used	Authors and year
South Ethiopia	Education level of head, number of livestock, distance to market and family size	multinomial regression	Adugna Enyew (2012)
Borana Zone	Age of household head, farm input use, livestock extension service cattle size, distance to market and remittance	multinomial regression	Amare Molla (2018)
Fentale district, Oromia	Population growth, land and water shortage, adoption of cultivation, and climate change	Likert scale	Fikrineh Negash (2021)
Afar pastoral area	Access to markets, price of grains and livestock, Climate change and drought	likert scale	D. Tsegaye et. al (2013)
Eastern Ethiopia (Jigjiga District)	Educational status, age and sex of the household heads, and household size, remittances, livestock holding, as well as market access were important determinants of agro pastorals livelihoods diversification	multinomial regression	Abebaw and Dejene (2019)
Bale Zone, Oromia, Ethiopia	Educational Level of head, Age of head, Sex of head, Livestock holding, Distance to market and Access to credit service	multinomial regression	Birhanu and Getachew (2016)
Gojjam, Amhara region, Ethiopia	Location of the household, educational level, distances from the nearest market place and membership in cooperatives	Binary Logit	Kassie. et. al. (2017)

Source: From literature review (2022)

Diversification activities are critical to pastorals livelihoods at south Ethiopia. At the area there are a number of determinants beyond the control of individuals notably access to market, good transport links and sufficient human capital [30]. The study under taken in southern part of Ethiopia revealed that level of education of head, livestock holding size, distance to market centre and family size were statistically significant and influence the pastorals income diversification [31].

According to study result, the major constraints to livelihood diversification in pastorals and agro pastorals of Mieso District, Oromia Regional State includes poor asset base, lack of financial facilities, lack of awareness, lack of

rural infrastructure, and lack of opportunities in different activities [19]. Additionally, the result of study on determinants of livelihood diversification, using multinomial logistic regression model revealed that the probability of diversifying in to highly and moderately diversified livelihood category is affected positively and significantly by age, sex, education level and access to credit facilities of the household head [32].

Other study revealed that increasing human population, shortage of land, adoption of cultivation and water shortage were perceived to be the most important drivers of change in fentale district, Oromia, Ethiopia [14]. The increment of population results in share of crop land among families that

decrease the holding size of crop land. At most of pastorals and agro-pastorals area of Ethiopia the expansion of education is not as such relative to highland mixed crops practice area. The pastorals have low habit of educating their parents. This result the high concentration peoples livelihoods on pastoral system.

The study at afar regional state revealed as the livelihoods of pastoral households are challenged by both internal and external factors [22]. The internal factors these influence the pastoral livelihoods includes decision role on resources, pasture and water shortage, low annual income, low educational level and too much family labour. On the other hand, the external factors encompasses access to markets, price of grain and livestock, terms of trade, price of inputs, shortage of occasional labor force, climate change and drought.

To promote the sustain livelihoods of pastoral households the government and others development planners should plan and implement the policy encourage the pastorals livelihoods diversification.

4. Conclusions

The pastoral of Ethiopia represent 10% of the country's population and constitutes 42% of the country's livestock number which the livestock contributes about 33% to the agricultural GDP and 16% to the national GDP in general. However the country's policy marginalized the pastorals contribution for overall development of the country and Policies have favoured externally imposed development schemes which often alienate and expropriate pastoral lands in favour of large-scale commercial activities.

The combination of policy marginalization with others factors such as forage land degradation, population growth and climate change push out the pastoral to shift their means of live. Unfamiliar activities that pastorals inter make their livelihood sustainability challenged. Hence, the livelihood diversification of pastoral households should base on their willingness. This paper clearly identify the motive of pastorals livelihoods diversification and its determinants.

The push and pull factors enforce the pastorals to diversify their livelihoods. Among the push factors that enforced the diversification of pastorals livelihoods the climate change, population growth, range land degradation, expansion of large scale investment and conflict are the main one explained in literature. On one side the pull or positive factors of livelihood diversification of pastorals these explained in the literature are the expansion of education, high farm labour market, and better market access and improved of hard infrastructure. The policy makers of pastorals area should incorporate these factors while plan for pastorals livelihood improvement.

Generally, the livelihood diversifications of pastoral households are important to sustain their livelihood and overcome calamities and disasters if it is managed accordingly. Hence the policy makers should not follow the strategy of 'one fit fo all' and encourage the policy that appropriate for pastoral households.

References

- [1] Dinku, A. M., Determinants of livelihood diversification strategies in Borena pastoralist communities of Oromia regional state, Ethiopia, (2018) Agriculture & Food Security, vol. 7, no. 1, pp. 1-8.
- [2] Virtanen, P. and Gemechu, T., Global climate policies, local institutions and food security in pastoral society of Ethiopia., (2011) Journal of sustainable development, vol. 5 no. 1, pp. 1-15.
- [3] Eyasu, E., " Pastoralists in Southern Ethiopia: Dispossession, Access to Resources and Dialogue with Policy makers. (2008), Norway, 2008, vol. DCG Report No. 53.
- [4] Pavanello, S., Pastoralists' Vulnerability in the Horn of Africa: Exploring Political Marginalization, Donors' Policies, and Cross-Border Issues Literature Review. Humanitarian Policy Group (HPG) Overseas Development Institute London, UK., (2009).
- [5] OCHA, U., "The future of pastoralism in Ethiopia. Addis Ababa, Ethiopia. (2007), 2007.
- [6] PFE, I., DF, "Pastoralism and Land: Land tenure, administration and use in pastoral areas of Ethiopia. (2010), 2010. Affairs-Pastoral, U. O. P. U. N. O. f. C. o. H. and Initiative). C., " The future of pastoralism in Ethiopia. Addis Ababa, Ethiopi, (2007), 2007.
- [7] Kassahun, A., Characterization of Range Land Resources and Dynamics of the Pastoral Production Systems in the Somali Region of Eastern Ethiopia (2006). Ph. D dissertation submitted to University of the Free State, Bloemfontein.
- [8] Pantuliano, S. and Mike, W., Improving drought response in pastoral regions of Ethiopia. Humanitarian Policy group, ODI, London, UK., (2008).
- [9] Sarah, A., Rural livelihood diversification in sub-Saharan Africa: a literature review. The Journal of Development Studies, 51 (9), 1125-1138. <https://doi.org/10.1080/00220388.2015.1046445>, (2015).
- [10] Sisay, B., Review on Rural livelihood diversification among the smallholder farmers in some Africa countries. International Journal of Agricultural Economics Extension and Rural Development, 1 (1), 10-016. <http://www.advancedscholarsjournals.org/journal/ijaeerd/articles>, (2013).
- [11] Adem, M., Tadele, E., Mossie, H., Ayenalem, M., and Yildiz, F., Income diversification and food security situation in Ethiopia: A review study. Cogent Food & Agriculture, 4 (1), 1-17. <https://doi.org/10.1080/23311932.2018.151335>, (2018).
- [12] Andualem, K. and Ebrahim, E., Review on livelihood diversification and food security situations in Ethiopia, Cogent Food & Agriculture, 7: 1, 1882135, DOI: 10.1080/23311932.2021.1882135, (2021).
- [13] Little, P. D., Income diversification among pastoralists: Lessons for policy makers. Policy brief number 3. Tufts University, Medford, MA. (2009).
- [14] Fikrineh, N., Socioeconomic and Ecological Transitions of Pastoral System in Semi-arid Areas of Rift Valley, Fentale District, Ethiopi, (2021) Journal of Rangeland Science, 2021, Vol. 11, No. 4.

- [15] Köhler-Rollefson, I., Innovations and diverse livelihood pathways: alternative livelihoods, livelihood diversification and societal transformation in pastoral communities, (2016) *Revue scientifique et technique* (International Office of Epizootics), vol. 35, no. 2, pp. 611-618.
- [16] ADF, "(African Development Forum Governance for Peace and Security in a Changing Climate. Issues Paper #6. Seventh African Development Forum. Acting on Climate Change for Sustainable Development in Africa. United Nations Conference Centre. Addis Ababa, Ethiopia,," 2010.
- [17] Headey, D. and Jayne, T., Adaptation to land constraints: Is Africa different? *Food Policy*, 48, 18–33. doi: 10.1016/j.foodpol.2014.05.005, (2014).
- [18] Beyene, S., Livelihood diversification among the pastoral and agro-pastoral groups in the upper Awash Valley, Ethiopia. *Journal of Human Ecology*, 39 (3), 241–253., (2012).
- [19] Tenaw, Z. T., Constraints of Pastoral and Agro pastoral Livelihood Diversification in Eastern Ethiopia: The Case of Mieso District, Oromia Regional State, (2016) *International Journal of Sciences: Basic and Applied Research* Volume 26, No 3, pp 267-274.
- [20] Gezahegn, A. and Natnael, D., "Supporting sustainable Pastoral livelihood in dry land of Ethiopia: unlocking untapped potential, (2016) ILRI, Ethiopi, 2016.
- [21] Jon, A. et al., "Lands of the Future: transforming pastoral lands and livelihoods in eastern Africa."
- [22] D. Tsegaye, Vedeld, P., and Moe, S. R., Pastoralists and livelihoods: A case study from northern Afar, Ethiopia, (2013) *Journal of Arid Environments*.
- [23] Gebru G, D. S., Seeking survival: The case of pastoral drop outs in Borana Plateau of southern Ethiopia. Presentation at the International Conference on Future of Pastoralism, 21-23 March 2010, ILRI, Addis Ababa, Ethiopia., (2010).
- [24] SC-UK, "(Save the Children–United Kingdom). Climate related vulnerability and adaptive capacity in Ethiopian Borana and Shinile communities. Final Report Assessment, (2009), 2009.
- [25] Bollig, M., Adaptive cycles in the savannah: pastoral specialization and diversification in northern Kenya, (2016) *Journal of Eastern African Studies*, vol. 10, no. 1, pp. 21-44.
- [26] Kassie, G. W., Sangho, K., and Francisco P, F., Determinant factors of livelihood diversification: Evidence from Ethiopia, (2017) *Cogent Social Sciences*: ISN: (Print) 2331-1886 (Online) [Journal homepage: https://www.tandfonline.com/loi/oass20](https://www.tandfonline.com/loi/oass20).
- [27] Simtowe, F., Asfaw, S., and Abate, T., Determinants of agricultural technology adoption under partial population awareness: The case of pigeonpea in Malawi. *Agricultural and Food Economics*, 4, 7. doi: 10.1186/s40100-016-0051-z, (2016).
- [28] Amare, M., Determinants of livelihood diversification strategies in Borena pastoralist communities of Oromia regional state, Ethiopi, (2018) *Agriculture & Food Security*.
- [29] Homewood, K., Trench, P. C., and Kristjanson, P., "Staying Maasai? Pastoral livelihoods, diversification and the role of wildlife in development," in *Staying Maasai?*: Springer, 2009, pp. 369-408.
- [30] Grace, c., Livelihood diversification in southern Ethiopia, IDS working paper 117, (2000).
- [31] Adugna, E., Determinants of Livelihood Diversification in Pastoral Societies of Southern EthiopAvailable Online at<http://www.onlineresearchjournals.org/JABR>, (2012) *Journal of Agriculture and Biodiversity Research*.
- [32] Birhanu, N. and Getachew, D., Livelihood Diversification: Strategies, Determinants and Challenges for Pastoral and Agro-Pastoral Communities of Bale Zone, Ethiopia,(2016) *International Review of Social Sciences and Humanities* Vol. 11, No. 2 (2016), pp. 37-51 www.irssh.com ISSN 2248-9010 (Online), ISSN 2250-0715 (Print).