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EXPLORING THE NEXUS OF POPULATION PRESSURE, CLIMATE CHANGE, AND OVERGRZAING IN DISTRICT LOWER DIR KHYBER PAKHTUNKHWA

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ABSTRACT

This study aimed at finding the association of population pressure effect on climate change (overgrazing). The study was conducted in seven tehsils and fourteen village councils of Distract (lower) Dir Khyber pukhtunkhwa, Pakistan. A sample size of 346 respondents was selected through simple random sampling. Data was collected on a two level likert scale interview schedule. The association of study variables was tested by using chi-square test statistics. The association population pressure effects on climate change district lower Dir Khyber Pakhtunkhwa perception of local farming community was found significant with population pressure effects on the over grassing aspects.(P=0.000, Tau-b=0.412) association was revealed reveled between climate change and Livestock plays a vital role in causing overgrazing.(P=0.000) and positive (Tau-b 0.266) highly significant association was inferred between climate change and overgrazing which degraded rangeland ecosystem in the study region. These findings alluded towards an indispensible relationship between overgrazing and climate change. (P=0.000) and positive (Tau-b=0.546) significant association was detected between climate change and overgrazing people rely mainly on grazing as the main source of fodder for their animal.

***Key Words*:** Population, Pressure, climate change and over grassing

INTRODUCTION

Human activities such as the burning of fossil fuels have significantly contributed to climate change by increasing the levels of greenhouse gases in the atmosphere, which trap heat and warm the Earth's surface. This has led to an increase in global temperatures and changes in weather patterns, including more extreme weather events (Karl and Trenberth,2003).Climate change is a significant global concern, caused primarily by human activities such as burning fossil fuels, deforestation, and industrial processes(Liu et al., 2016).

The consequences of these changes are becoming increasingly evident at local and regional levels, and are having a major impact on human communities and natural systems, such as agriculture, water resources, and biodiversity(IPCC, 2007).The warming of the Earth's atmosphere and oceans, caused by the increase of greenhouse gases, is causing widespread changes to the climate(IPCC, 2013). The primarily caused by human activities such as the consumption of fossil fuels, industrial production processes (Yousaf et al., 2017a).Agriculture and forestry, human society and vehicle use. (Huang et al, 2016).

These emissions include carbon dioxide and other greenhouse gases (Youssef et al., 2017b). Such as methane, nitrous oxide, HFCs, per fluorocarbons, and sulfur hexafluoride. In 2010, global emissions increased at an alarming rate of 5.8 % (Carter et al., 2015).Climate change are not only recognized internationally but also has its impacts locally (BC Government, 2008). There are various hazards linked to climate change, such as natural disasters, unemployment, and forced migration, which rise for exposed, disadvantaged, and at-risk communities. In this context, vulnerability is defined as a role of socioeconomic religion, status, class, livelihoods, ethnicity, race, gender, family and age (Ribot et al., 2009).

LITERTURE REIVEW

Overgrazing is a situation where the level of supply falls relative to the demand of the animals that depend on it to survive. .The result is that the earth becomes barren. Erosion starts because the topsoil is exposed. Unwanted plant species may start to grow and take over the land. When an excessive number of animals graze on a specific piece of land, leading to the destruction of vegetation and soil erosion. One solution is to implement planned grassland

management, which can involve moving livestock to different grazing locations to avoid overgrazing in one area. Another solution is to reseed land with perennial grasses, which are grasses that re grows year after year. Additionally, unwanted woody plants can be burned to control their spread and allow for the growth of desirable grasses(Teague et al., 2011).

China has 4 billion hectares of grassland, accounting for about 42% of the country's land area (Ren et al. 2007). In addition, they are mainly distributed in the arid and semi-arid regions of the northwest, north, and southwest, and near the sources of major rivers such as the Yellow River and the Yangtze River (IGSNRR 1992).Grassland degradation, usually defined as a negative decline in biodiversity and biomass production, increased soil erosion and nutrient loss, is a growing concern in China. It is often said that 90% of China's grasslands are degraded to varying degrees, of which at least 1.3 billion hectares are moderately degraded, and the degraded area is increasing by about 2 million hectares per year (Ren et al. 2007). It is also reported that due to under-cultivation and over-exploitation of land, by the early 21st century, the northern boundary of the grassland had shifted by 200 kilometers to the south and the western boundary by about 100 kilometers. Towards the east compared to the last hundred years (Liu 2008).

As stated by Harris (2010), 90% of the frequency is uncertain because it was ultimately based on undocumented surveys conducted by the local Grassland and Livestock Office in the 1980s, with no strict baseline or methodology. Attempts to more precisely quantify the degree of degradation have led to more ambiguous results. However, there is no doubt that there are areas where degradation has been limited and sometimes very severe. In addition, there is evidence of reduced vegetation productivity, including direct perception of vegetation degradation by pastoralists (Wang et al., 2012)and numerous studies on livestock Milk production (Cerny, 2010; Zhou et al., 2004; Yan et al. 2012;Yundanima,2012). According to one estimate, the above ground biomass in China dropped from an average of about 2.2-3.0 t ha-1 in the 1950s to 0.7-0.9 t ha-1 in the 1990s, which not only led to a decline in animal husbandry production, but also caused direct economic losses of about 79% per year Million dollars in dust storm losses (Akiyama and Kawamura 2007). To understand the etiology of grazing degradation, all its ecological, political-economic, and socio-cultural dimensions must be considered, but until recently such research in China was very limited (Harris 2010; but see Fernandez(Gimenez et al. 2012; Xie and Li 2008; Wang and Zhang 2012).

As Harris (2010) also points out, physical scientists tend to emphasize global climate change and overgrazing (Li et al. 2008; Liu and Wang 2007). Especially rainfall reduction (Ren et al. 2007:Wu 1995).The main cause of grassland degradation in China. In contrast, Western scientists and a small but growing number of Chinese social scientists tend to advocate degradation, as well as reduced adaptive capacity to deal with climate change. The most notable of these include the pasture responsibility system implemented since the 1980s, which granted grazing use rights to individual units, mainly families, along with deeper economic reforms and market pressures and the new "recover pasture, retire Livestock (grazing to grass) and ecological migration policies implemented since the mid-2000s (Bauer 2005; Foggin 2008; Ho 2000; Li and Huntsinger 2011; Williams 2002).

Grassland degradation is considered a milestone by the researchers, providing an analysis of evidence of climate change and overgrazing in China over the past three decades. In a critique of these as default arguments for explaining observed rangeland degradation, it is argued here that more attention should be paid to the institutional factors of degradation, particularly management policies of fencing and land contracting, which have replaced large grazing herds and fragmentation rural scenery. It has been argued that, over the past three decades, there has been increasing evidence across China that the latter is a driver of grassland degradation, which has important implications for identifying possible mitigation measures (Harris,2010).

Open grazing is common practice, but has many disadvantages. This is mainly due to the lack of control and management of grazing and animal husbandry, which is practiced under municipal ownership, which often leads to vegetation and soil degradation and leads to social conflicts. There have been many successful attempts to change the traditional model, calling for a systematic approach to cattle breeding in the Abufas exclusion zone (1960), as exemplified in Sudan from the early 1980s to 2002. Although rainfall has decreased, vegetation cover is recovering. However, there is enormous grazing pressure, especially for goats. In other areas, on clay plains, the process of soil degradation lasts for a long time. (United Nations Office in Somalia (UNDP.1997) Livestock overgrazing is generally considered a major cause of soil degradation and erosion (Laker, 2000).States that "overgrazing is the main anthropogenic factor contributing to the acceleration of water loss in South Africa". As noted by Ainslie (2002), urban

grazing areas are often considered to be particularly prone to overgrazing and degradation due to excessive animal populations and poor management techniques (Hoffman and Ashwell, 2001).

Indicate that grazing rates in public domains in South Africa are approximately 185 times higher than commercial farm grazing rates in regions of comparable rainfall (Dodson, 2000). Nicely illustrates the idea that these high numbers lead to land degradation: soils are eroded and water resources are depleted. "Vegetation cover is a key factor controlling the rate of soil loss caused by surface water erosion. Vegetation cover, in turn, is the result of complex interactions between climate, soil and topography, and herbivores. To understand the effects of grazing on soil erosion, we must first understand the ecology of grazing within rangeland ecosystems, and second examine. How ecological processes unfold through the soil erosion process. To better address the debate on soil erosion issues associated with municipal pastures.

MATERIALS AND METHODS

This study was conducted in seven tehsils namely Tehsil, Adenzai, Balamabat, Khall,LalQilla,Munda, Sumarbagh and Timergarain District Lower Dir, Khyber Pakhtunkhwa, Pakistan. Total population (House hold heads) of potential respondents came out to be 3222. For a population size of 3222 a sample size of 346 suffices as per criterion devised by Sekaran (2003). The study design was single-shot and data was collected through interview schedule covering both the variables. A conceptual framework was devised comprising of two study variables i.e. climate change (Dependent Variable) and over grassing (Independent Variable) (Table 1). For the measurement of study variables the attitudinal statements were pooled from the existing literature and two level likert Scale was constituted for each study variable. The indexed dependent variable (climate change) was cross tabulated with independent variable (over grassing) to measure the association between study variables. Chi-square test was used to test the level of association between these variables at bi-variate Level.

$$\chi^2 = \sum_{i=1}^{c} \sum_{j=1}^{r} \frac{(O_{ij} - e_{ij})^2}{e_{ij}}$$

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Table 1 Conceptual Frame Work

Independent variable	Dependent variable
Over grazing	Climate Change

OBJECTIVES OF THE STUDY

1. To determine perception of farmer's in regard to climate change.
2. To find out the perception of the respondents regarding population pressure, overgrazing factors as driving force for climate change.

RESULTS AND DISCUSSION

1.1 FREQUENCY AND PERCENTAGE DISTRIBUTION ON THE BASIS OF OVER GRASING

Cutting rising and land are interdependent and indispensible for one another. Grazing of animal on the grassland provides feed in nourishment and human utilize these animals for the domestic and commercial requirements. However, exceeding in number of cattle's has observed to be number of in farm of biodiversity and ecosystems perseveration rather ending at the degradation of the land and environment. (*Pulido, Manuel, et al, 2018)*Overgrazing means increase in number of animals on a check of land beyond the capacity i.e on unsustainable basis. These overgrazing is detrimental in disturbing the ecological equilibrium not favoring the rangeland and its ecosystem in the shape of land degradation the existing vegetation consumption by more than required number of animals at the cost of ecosystem capacity to regenerate.

Table. No. 1. Overgrazing

S.No	Overgrazing	Yes (%)	No (%)
1	Livestock is a source of income in your region	210(60.7%)	136(39.3%)
2	Livestock plays a vital role in causing overgrazing	214(61.8%)	132(38.2%)
3	Overgrazing is causing rangeland ecosystem	204(59.0%)	142(41.0%)

	degradation in your area		
4	With passage of time, the grazing areas are vanishing.	223(64.5%)	123(35.5%)
5	Overgrazing is the main human induced factor causing accelerated land erosion.	214(61.8%)	132(38.2%)
6	Overgrazing leads to loss of biodiversity.	216(62.4%)	130(37.6%)
7	Are you willing to make changes in your grazing management practices to reduce overgrazing	212(61.3%)	134(38.7%)
8	Overgrazing is the main cause of rangeland depletion	190(54.9%)	156(45.1%)
9	People have no other means but to rely on grazing as the main source of fodder for their animal	219(63.3%)	127(36.7%)

The above table no 4.3.2 illustrated regarding the overgrazing in this regard and this question was asked from the respondents a significant majority of the respondents (60.7%) agree with yes option that Livestock serves as a source of income in their region while, (39.3%) of the respondents disagreed. livestock is the main sources of income in the study area as intimated from the study findings. It could be attributed to the availability fodder in natural shape as a wide Varity of grazing lands existed in the mountainous ranges. Furthermore, it's above contribution in the form of economic returns such as getting milks; meat and selling the reproduce have attained a shape of a business cycle (FAOSTAT, 2020). Statisticsalso disclosed the relative importance of livestock in the agriculture and alluded towards it role in flourishing of industries, like poultry, meat and milks of wool respectively. People ought to graze their cattle, freely on these lands, while getting return cash and kind. It is a major source of income and little invested in it which cores the needs and requirements of various nature like meat and milks (proffer danger for fire purpose and also being used in carrying luggage and providing transportation(CIRAD, 2016 ;Rashid, A., et al.2016;Akbar, 2020).

Considerable number of respondents (61.6%) also acknowledged that livestock plays a crucial role in causing overgrazing. moreover, (38.2%) of participant were disagreed. Livestock is one of the leading force or cause of overgrazing globally. Overgrazing occurs when livestock consume the vegetation available with fastest rate leading to destroying the regeneration capacity the land which badly affects the ecosystem soil fertility and the existing biodiversity. Overgrazing has been noticed across the globe albeit the study area where, the demand for meat,

milk and other sub products of livestock has survived, however, due to rising population of human the grazing land is squeezing day by day. These double effects pressure i.esurgedemand of livestock and squeezing of grazing land have negative consequence ecosystem as it disrupts the plant and animals species by destroying its habitat of native species, surfacing of land erosion and soil infertility. FAO (2011) has also pinpointed this harsh reality in its report and predicted that agriculture and livestock production could not coincide with raising no of population up to 2050 years. Loss of grazing land would divert the raring of animal indoor which would require greater core to provide fodder health without sunlight and outside roaming rather mostly dependent on manmade medicine these would turn the whole business to move costly and layout the affordability of concern man (Smith, Pete, et al.2016;Kraham,2017).

Furthermore, a majority (59.0%) of the participants agreed that overgrazing leads to the degradation of the rangeland ecosystem in their area. Moreover,(41.0%) of the respondents denied the answer. These findings had close resemblance to the above mention inference. These rangelands usually occupy a chuffer zone and position between the desert and agriculture land. It major characteristics included low rainfall making the land unable to cultivate on permanent grounds (Zerga, Belay, et al.2018). These overgrazing has already been proven to be harmful to the environment, biodiversity and ecosystem. It basically destroys the fertile layer of the land render it unable to regenerate the gross (Wang, Yanfen, et al.2019).

Increase in livestock demand for more grazing venues for the longer period of time resulting into high density of animals, throughlucrative as cash commodity but excessive use of these grazing land are quicklyexhausted leading to soil erosion, and degradation and although of topography favoring natural disasters high flood avalanche due soil erosion. Such developments usually end up with loss of vegetation of basic nutrients necessary for animal growth and development. Loss of productivity push the pastoralist in search of other land to graze their animals, such like situation usually entail on internal migration of people and cattle's and exhausting of the future resources i.e or may lead to loss of cattle's dare to non- availability of fodders in the rangelands (Zerga, et al., 2018;Crovo,et al.2021;Ikhuoso,Alaanuloluwa, et al.2020;Pfeiffer, et al.2019).

Moreover, a leading portion (64.5%) of the respondents believed that grazing areas are disappearing over time. whenever, (35.5%) of the respondent's refused. These line could be attribute to the realities existed on ground pertaining to the disappearance of rangelands it could be to the increase in the number of livestock's by putting pressure on the available resources in these rangeland or due to the climate change , affecting this natural cycle prevailed since long. These findings were in lines with (Godde,et al. 2018).conclusion increased about population through expend economics but reducing the grazing land to ashes. The contraction of grazing land degrade the environment and challenging the existences of ecosystem as more animal and are hardly to feed on limited grazing space for a long period of time. Moreover, another potential threat is the population expansion of human. Increased human population has also turned their grassland into living settlements, dwelling and agriculture land. It is also essential that overgrazing destroy the posters and shorter their carrying capacity to feed livestock (Wairiu,2017;Sica, Yanina, et al.2016;Rahimi,et al.2021;Teague, R., & Barnes, Niu, Yujie, et al.2017;Chalise,2019). However, in certain instances, deforestation also leads to the elimination of grazing land (Oljirra, 2019).

Furthermore, the study indicated that many of the research respondents (61.8%) also pointed out that overgrazing is the primary human-induced factor contributing to accelerated land erosion. However, (32.2%) of the respondents negative viewed about the statement. These findings were to Zerga (2015).that overgrazing is the resultant factor of putting more stress on land to produce for more animals destroying its carrying capacity to feed. Such induce of human approach form more animals grazing usually left soil erosion, loss of local land behind and biological species and plant diversity. Nutrient imbalance is yet another outcome of overgrazing and loss of soil fertility (Ayub,et al.2020;Michalk, et al.2019;Zerga,et al.2018)..

A substantial number; i.e (62.4%) of respondents agreed to this statement that overgrazing results in the loss of biodiversity. Moreover, (37.6 %) participant refused the option. It could be inferred from these findings that overgrazing is harmful to the existence of biodiversity, less of malnutrition contents, essential for animal growth with resulting poor qualities forge. (Ikhuoso, et al.2020).some undesirable non-local plants grow on these lands due to overgrazing by eliminating the native species. Moreover, the rangeland carrying under these invasion usually lose their native ecosystem necessary for the maintaining an equilibrium is

either lost or distributed (Hanberry, 2023; Middleton,2018;Zerga,et al.2018). The loss of natural habitat with diminishing wildlife is also in one amongst the imminent outcome (Broom, 2018;Ahlborn,et.al.2020)

The study population further strongly supported (61.3%) to implementing changes in grazing management practices to mitigate overgrazing. Whenever, (38.7 %) of the respondents neutral the answer. Farmers in the study had indeed recognized the urgent need to implement changes in grazing management practices due to the adverse effects of overgrazing. However, their ability to make these changes wave severely hampered by the absence of viable alternatives cum of leadership non-existence. These finding had close resemblance to the conclusions (Schwilch, et al, (2014). That lack of knowledge and awareness in part of farmers regarding in the rangeland usages, benefits associated to it and non –practices of sustainable notion how led to the average effects of overgrazing. Furthermore, environmental change and other challenges, the farming community is coping on face getting more forged from this rangeland, which is losing its productivity and vegetation due to overgrazing. Mostly half of the total livestock population is dependent on grazing land in Pakistan, which might have contributed to meeting the needs of livestock provided these are properly managed in an effective and scientific manners (GOP, 2010a; Dumont, et al.2015)

Overgrazing is one the significant contributor to rangeland depletion in Khyber Pakhtunkhwa like other regions of the world. Rangeland is area where livestock graze on natural grass and vegetation in Khyber pakhtunkhwa these are substantial pastoral economy, overgrazing has been a persistent problem (Mansoor, et,al,2018) Khyber pakhtunkhkhwa has also a huge livestock population and rangelands are also plenty in number. However, it proper management mechanism is lacking the constant pressure for the demand in meat, milk and other items related to livestock and led to increase number of livestock, such demand need to be poverty anticipated and devised strategies to negotiate (Naz,and Khan,2018)

Similarly, a large number of respondents (54.9%) identify overgrazing as the main cause of rangeland depletion while, (45.1%) participant do not agreed with the statement. It could be assumed from these findings overgrazing was often cited as one of the main causes of rangeland depletion in Pakistan as has been inference from the aforementioned conclusion s as well.

Overgrazing has no doubt led to the elimination of ecosystem and loss of biodiversity. Moreover, land degradation could not also be ruled out due to overgrazing as overgrazing mean unsustainable practices by poor controlling the depletion of land (Anjum &Naeem, 2022 ;Mirzabaev et al.2016;Qasim,& Termansen,2013.Naz,& Khan,2018;Habib,et al.2016).

Lastly, in the total population, (63.3%) of respondents expressed the view that people have no choice but to depend on grazing as the primary source of fodder for their animals. Moreover, (36.7 %) participant negative opinion people dependency on overgrazing in the study region. In many parts of Pakistan, grazing lands have been identified as the major source of feeding the animal with the study area as no exception in the study area, the lack of alternatives has forced people to rely on grazing as the main source of fodder for their animals. This situation has turned the grazing lands under tremendous pressure as other alternative are lacking. Certain factors like financial constraint of farmers to by the commercial feed for the animal could be cited as viable reasons. The lack of knowledge regarding the usage of these commercial forge is yet another stumbling factor in putting pressure on the grazing lands. The pressure has led to the loss of equilibrium both in sustenance of animals and rangeland *(*Miller,and Lu, 2019;Gioli, Giovanna, et al.2019;Salo,2017;Son,& Kingsbury, 2020).

Table No. 1.2. Overgrazing

S. No.	Independent variable (overgrazing)	Dependent variable	Statistics
1	Livestock is a source of income in your region	Climate change	$\chi 2$=6.241 P=0.012 T^b=0.-134
2	Livestock plays a vital role in causing overgrazing	Climate change	$\chi 2$=58.711 P=0.000 T^b =0.412
3	Overgrazing is causing rangeland ecosystem degradation in your area	Climate change	$\chi 2$=24.542 P=0.000 T^b =0.266
4	With passage of time, the grazing areas are vanishing.	Climate change	$\chi 2$=4.737 P=0.030 T^b =0.117
5	Overgrazing is the main human induced factor causing accelerated land erosion.	Climate change	$\chi 2$=37.226 P=0.000 T^b =0.328
6	Overgrazing leads to loss of biodiversity.	Climate change	$\chi 2$=4.585 P=0.032 T^b =0.115

7	Are you willing to make changes in your grazing management practices to reduce overgrazing	Climate change	$\chi 2$=25.587 P=0.000 T^b =0.272
8	Overgrazing is the main cause of grassland depletion	Climate change	$\chi 2$=33.553 P=0.000 T^b =0.311
9	People have no other means but to rely on grazing as the main source of fodder for their animal	Climate change	$\chi 2$=103.149 P=0.000 T^b =0.546

Pakistan being agrarian economy but facing some dares consequence regarding the land use in agriculture and related activities through it has been declared a leading country in number of livestock's population in the world which is mostly dependant on grazing land and farm land. These farms lands are working as huge region in maintain the health of the land due to this ecosystem, biodiversity. However, it has been noticed that these farms lands have been facing a huge number of animal population being fed on this constant overgrazing has destroyed the natural equilibrium between ecology and human which has lead to the distraction of existing landscape and ended up in environmental degradation. The animal population is releasing methane gas, which has a high warming degree than other sources however, not so effective due to its shorter period of time (*F*AO, 2020*;*Tubiello, et al,2015;Pulido, et al, 2018). Pakistan being agrarian and nature, which high livestock's population (estimated around 200 million) has badly overwhelmed the existing grazing resources, which has drastically reduced the vegetation while emanated in soil erosion and desertification (Rashid et al. (2019*)*

Keeping in view the table 1.2.1 which depicted that a highly significant and positive association was detected between live stock is a source of income and climate change (P=0.012) but negative (Tau-b=0.-134).livestock's play a major role in the livelihood of many rural famers in Pakistan. These results intimated about the financial importance of the livestock's of the rural people and rural economy of Pakistan is mainly dependant on the livestock population. Farmers are used to fare and raise livestock as it has source to add into cash flow for the farmers. Moreover, most of the dairy needs are also met through its milk, meat, beef and even chicken. However, regarding its application in terms of climate change the respondent were found ignorant as indicated by negative Tb value. These making the rural economic life running. It is often understood that a single care serves as a viable unit of economy in the rural areas as it reproduce itself, give milk and dung , all are useful and beneficial in human lives. These findings

has ample supported by (Balehegn et al. 2020) that is most of the Asian countries the livestock products server to contribute towards food security with a strong relationship between animal, milk, animal work per hectare also endorsed the above findings as reflected in results (Ali and Khan (2013) that people having animal had higher degree of access to food security in the comparison those who had no animal. Moreover, the global importance of livestock is also acknowledged as principal source of food and employment for the people (Maqbool, & Anwar, 2018; Khan et al., 2019;Khanal, et al.2022;Khanal, Prabhat, et al.2022)

Similarly, a highly significant and positive (P=0.000, Tau-b=0.412) association was revealed reveled between climate change and Livestock plays a vital role in causing overgrazing. It could be attributed from these results that livestock's grazing is a dependant on nature. This dependence has aggravated due to sudden change in temperature, variation in seasonal cycles, droughts, and change rain patterns. These entire factors have negatively affected the grazing land capacity resulting into environmental degradation. These lines were in coinsurance to *(*Pulido, Manuel, et al, 2018).that excessive number of livestock on the livestock existing grazing farm land damaged the probabilities persistent on basis with block chance for continuity of livestock raising on sustainable farmland. This uncertain situation has also put in imbalance the ecological balance between ecosystem, biodiversity and environment. Moreover, overgrazing had a significant role in producing methane albeit in small amount in comparison to fossil fuel vegetation cover is also under threat with the emergence of soil erosion, scarcity of resources and land degradation *(*Tubiello, et al, 2015;Tariq et al,2014; F.A.O, 2012).

Likewise, highly significant (P=0.000) and positive (Tau-b 0.266) highly significant association was inferred between climate change and overgrazing which degraded rangeland ecosystem in the study region. These findings alluded towards an indispensible relationship between overgrazing and climate change. Climate change has been noticed through variation in rainfall frequency, change in weather patterns and uncertain seasonal cycles. All these have extreme devastating effects on the local forests, agriculture land pertaining to this productivity and preservation. These results further indicated the weather resilience of the local ecological system on the face of these severities. These findings had a strong resemblance to (Bengtsson et al,2019;Gibson & Newman, 2019) conclusion that local ecological resistance is fading in front of rising threat of climate change and overgrazing. Overgrazing has particular emanated the

immiscible losses like reduction in pasture land and huge desertification, which has considerably threatened the sustainability in livestock related affaire by pushing in rural population into extreme dejection in financial, social and ecological terms(Ajai, &Dhinwa, 2018;Filazzola et al., 2020; Thornton, &Herrero, 2010)

Summarily, a significant (P=0.030) and positive (Tau-b=0.117) association was unmasked between overgrazing and climate change in a sense that with passage of time grassland decreases which ultimately has negative consequences for climate. These results endorsed the proceeding findings the people in the study area were aware of the variation in ecology pertaining to loss of grazing land and seasonal variation which had negatively affected the countries long practices putting to grazing livestock ,it business and land capacity . Moreover, the study area has also witnessed the land transformation of the grazing land into agriculture land and commercial sites besides erecting human settlements. These developed were matching in mean to (Tsegaye, et al.2010) that population pressure had exert pressure on local resources with major assault on land, it use patterns. People had a tendency of converting grazing land and agriculture land into human dwelling, leaving the remaining portion under server pressure to produce more for the local consumption. In addition farming community had been pushing into extreme exchange due to inabilities to satiate their own livestock's needs pertaining to this changing circumstance resultant from climate change and overgrazing. It was obvious that land capacity had collapse to produce more while the existing escape had also been exposed to degradation with resulting factors desertification environment degradation and loss natural habitat (Odorico, et al.2013; Meshesha, et, al, 2019;Abdi, et,al,2013;Joshi, et al.2013).

Additionally, highly significant (P=0.000 positive Tau-b 0.328) association was revealed between climate change and overgrazing in terms that humans are the main driving force behind overgrazing through animals causing climate catastrophe. All human efforts based on more produce, from rising of animals though had significantly contributed to their income but at the cost of depletion of natural resources like lose vegetation cover and degradation of environment. Hectic and uncontrolled human activities based an exhaustive approach towards use of land with certain unhealthy innovative design have put the local environment, resources and land dependant like human and animal stable. The ecological imbalance has also surfaced which provided information pertaining to loss of ecosystem, biodiversity as well (Anjum, et al.2010)

have also pointed toward the soil erosion, land erosion, due to increased human activities. Increased humans have hosted the demand for livestock, which had tremendous load on the existing capacity of the land and usually succumbed to produce on sustainable grounds. Up taking human and animal activities with undeniable fact of climate change has eroded the sustainable chance of natural equilibrium between resources production and consumption. Moreover, this grin situation has further been exacerbated with the raising variations due to climate change, global warming and seasonal pattern, i,e, sneezing of spring and expansion in summer rendering the agriculture production dynamics ineffective to produce as per demand inducting towards a low level of reliance to this mismatching and unfriendly situation(WHO,2020; Leahy et al,2010; Beschta et al. 2013;Ellis 2011).).

However, a significant (P=0.032) and positive (Tau-b =0.115) association was demonstrated between climate change with overgrazing leads to loss of biodiversity. These results were in consonance to the proceeding inference and revealed the biodiversity had been lost due to climate change and overgrazing. These results affirmed the reduction in livestock population, farmer migration from the area relinquishing the livestock business due prevailing hostile environments. The local forest with limited capacity of grazing and unpredictable weather patterns like rainfall unpredictability has led to the deforestation and desertification turning the environment unfit for grazing and rearing of animals. Moreover, overgrazing had also surfaced with the issue of loss habitat for local wildlife species (Numbere &Maduike, 2022;Wang &Zhan, et al.2017;Wassie,2020). Moreover, food insecurity for local human and animal population could not also be ruled out (Domenico, et al. 2021).

Further, highly significant (P=0.000) and positive (Tau-b =0.272) association reflected between people are unable to manage the grassland from the desertification through overgrazing to prevent climate degradation. These results could be attributed to the people ignorance pertaining to containment of grass land desertification on face of overgrazing the non existence of a sound strategy designed by the state on the local government upon the use of resources on sustainable grounds. Moreover, as indicated by (Hashmi,et al.2017). That the loss of carrying capacity of land is attributed due raising number of livestock's with involvement of all the stakeholders like landowner, allied departments, like agriculture and forest collectively (Reagain, et al.2014;Hasnat,et,al,2018).Traditional approach in management of grazing land with rotational

cycle could be some of the probable strategies of mitigating to overgrazing and climate change hazards *(*Khurshid, et al.2022*;*Meshesha,et al,2019)as lacking of sound management pertaining to grazing activities had badly affected the sustainable model of the lands *(* Teague, et al.2013).

Furthermore, highly significant (P=0.000 and positive (Tau-b=0.311) was association discovered between overgrazing is the main cause of rangeland depletion. Overgrazing and land depletion in terms of resources, biodiversity and ecosystem had been adjudged indispensible. Moreover, transformation of land into agricultural uses and human settlements due rising population had further deteriorated the grazing capacity of these lands ending at soil erosion, variations in landscape and environment degradation due to extensive grazing activities(Anjum,et al.2010*)*which is the main sources of livelihood and food provision as well sins a proper management initiatives to overcome the grazing land depletion and climate change repercussions (Dagar, & Gupta,2020;Kairis,et al.2014 ;Bashir, et al. 2017).

Lastly, a highly significant (P=0.000) and positive (Tau-b=0.546) significant association was detected between climate change and overgrazing people rely mainly on grazing as the main source of fodder for their animal. These results explored the respondent's dependence on the land produced vegetation to feed their animals from grazing lands the importance of posture have gained immanence due to rising human populations needs pertaining to animal products like milks, meat etc. the rising of animals are the main guarantee in food provision to the population of Pakistan albeit sustained food security. However, grazing dependence on postures has turned up insecurity of water, loss of biodiversity and resources depletion along with environment degradation (Bardgett, et al.2021) has also pointed towards rural people history in Pakistan is rich with their depended on animals and their attached products like milks, meat, skin etc. variation in temperature and global warming has guarantee into climate change not in support people aspirations from grazing land (Khan, & Hashmi,2013) incapable of supplying the inputs derived from these lands as forage (García, et al.2012;Ates, et al.2018;McDermott, et al,2010).

CONCLUSION

The winded down through inference that overgrazing had caused the degradation of the local rangeland which led to vanishing of local biodiversity and ecosystem as the people had

high dependence for these grassland to sustain their local economy based on veterinary. Agricultural was the main profession and people used to practice both primitive and modern means of cultivation and harvesting along with application of chemical fertilizers in order to get more output from their farms in all available seasons by adjusting to adaptability in terms of crop protection management as well. The rising needs of firewood pressure was common for all and sundry and local used to relay on local woods form their forests cater their daily heating and cooking requirements sans the expansive availability of other sources of cooking and heating. The study disclosed that overgrazing had marred the prospects of coping with challenging phenomena of climate change. a synchronization in policy by the forest, agriculture department under the impious of government may work as catalyst in restricting the locals from excessive logging and overgrazing. This may add strength to the coping strategies of climate change

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