МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
НАЦІОНАЛЬНИЙ ЮРИДИЧНИЙ УНІВЕРСИТЕТ ІМЕНІ ЯРОСЛАВА МУДРОГО КАФЕДРА ЗЕМЕЛЬНОГО ТА АГРАРНОГО ПРАВА

НАЦІОНАЛЬНА АКАДЕМІЯ ПРАВОВИХ НАУК УКРАЇНИ
ВІДДІЛЕННЯ ЕКОЛОГІЧНОГО, ГОСПОДАРСЬКОГО ТА АГРАРНОГО ПРАВА

ПРІОРИТЕТНІ НАПРЯМИ РОЗВИТКУ АГРАРНОГО ЗАКОНОДАВСТВА І ПРАВА В СУЧАСНИХ УМОВАХ

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НАУКОВІ ДОПОВІДІ НА СЕКЦІЙНОМУ ЗАСІДАННІ

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NOMADIC PASTORALISM AT CROSSROADS: A NEED FOR RESTRUCTURING THE PARADIGM AND POLICY OF RANGELAND COMMONS

Abstract

Fading fast all over the world, nomadic people have faced biases concerning their lifestyles and their symbiosis with rangelands. The nomadic grazing, which is helpful to biodiversity, not detrimental, in rangeland commons is perceived and advocated by deep ecologists, conservation administrators and policy makers as a threat to conservation of ecosystems. Consequently, both nomadic pastoralists and rangeland ecosystems have suffered a grim fate. On the contrary, the subsistence pastoralism is an established sustainable strategy of livelihood and ecosystem conservation in the rangelands. Unfortunately, some of the most nutritive foods and other sustainable products of nomadic pastoralists have not desirably been priced in modern markets. With the demonstrated cases exhibiting the nomadic pastoralists, such as Hutsul shepherd communities of Ukraine, as most sustainable societies on planet Earth, there is urgent need for restructuring the popular paradigm and State policies on rangeland commons. In isolation of nomadic people, the rangelands cannot truly be conserved or protected. To begin with, the resilience of nomadic pastoralists to the changing environments and their (unique)

rangeland management can first be pondered. Accordingly, the policy and legal frameworks of States need to be reoriented and revised.

Keywords

Pastoralists; Rangelands; Enclosure; Hutsul; Grasslands; Mobility; Fragmentation

Rangelands and Pastoralism: Why do the pastoralists matter?

About half (6,700 million ha) of the Earth's land surface is covered by the scanty vegetation associated with natural rangelands . Majority of the land surface of planet Earth is used for grazing [1]. The land where most herding peoples and livestock make a living are characterized as open grazing lands, including savannahs, grassland, prairies, steppe and shrub lands [2]. It is estimated that grazing lands cover 61.2 million km2 or 45% of the Earth's surface (excluding Antarctica), 1.5 times more than forests, 2.8 times more than cropland, and 11 times more than urban settlement [3]. The grasslands – the basis for livestock production – cover about 70% of the global agricultural area [3]. The livestock is the fastest growing agricultural sector, and in some countries, it accounts for 80% of gross domestic product [2]. It is aptly estimated that more than one billion people depend on livestock, and 70% of the 880 million rural poor living on less than US$ 1 per day are at least partially dependent on livestock [2]. Nomadic and transhumant pastoralists may number 100-200 million people globally . The pastoralists are found in many parts of the world, including Africa, Central Asia, the Arctic, and southern & eastern Europe. The main livestock species kept by pastoralists are cattle, donkeys, goats and sheep, although they also keep, e.g., alpaca and llamas in the Andes, camels and horses in east-central Asia, the dromedary in Africa and West Asia, reindeer in northern Eurasia, and yak on the Tibetan Plateau and northeast India [1].

Scientifically, it is demonstrated that pastoralists and pastoralism make significant contributions to local, national and regional economies. Simel (2009) and Hesse (2009) demonstrated that pastoralism is considerably more productive per hectare than commercial ranching or sedentary livestock keeping in similar

environmental conditions, and that the high productivity of livestock in pastoral systems not only supports millions of pastoralists but also contributes significantly to other sectors of national and regional economies [8][9]. The economists have estimated that pastoralists produce 10% of the world's meat, supporting nearly 200 million pastoral households who raise about 1 billion head of camel, cattle and smaller livestock [10]. Besides, the economic contribution of pastoralism, it is essential to understand how pastoralism differs from other lifestyles. Dyson-Hudson & Dyson-Hudson (1980) conceptualized nomadic pastoralism as the coexistence of dependence on livestock with spatial mobility [11]. Others narrate that the nomadic or mobile pastoralism has long been a sustainable livelihood in a diverse range of countries because of herders' ability to move and manage risk in marginal landscapes where domesticated animals efficiently convert limited ecological productivity into sustenance [12]. Pastoralists exert control over their animals based on their preferences for livestock's products they make a living of either directly, or indirectly, through the usage of products from domesticated animals [13]. Extensive livestock grazing is an excellent example of managing biodiversity and soil fertility. For example, through the transport of seeds and insects by livestock, the migration of pastoralists and their flocks supports habitat connectivity and biodiversity [14]. The mobile and less intensive use of natural resources is usually a better and more sustainable way to use nature, especially in fragile environment such as rangelands.

The pastoralism is usually the optimal subsistence pattern in critical ecosystems because it allows considerable independence from any local environment. When there is a drought, pastoralists disperse their herds or move them to new areas. On the contrary, farmers rarely have such options. They suffer crop failure and starvation in the same situation. A pastoral subsistence pattern reduces the risk when there is an irregular climatic pattern . Thus, the key to pastoralism is mobility, which permits temporary exploitation of resources that are not sufficient to sustain a human and herbivore population for an entire year . A host of features of nomadic life reflect the demands and costs of mobility and of

dependence on herds of animals [to convert the energy stored in grasses to the milk, meat and wool] that feed the human population. So, pastoralist societies commonly develop a conscious and explicit nomadic ethos, which values mobility and the ability to cope with problems by moving away from threats or toward resources and which disparages permanent settlement, cultivation of the soil, and accumulation of objects .

Adaptation strategies adopted by nomadic pastoralists are talked high by scientists. According to McCabe [15], pastoral management strategies are best understood as rigged towards risk aversion rather than strategies that emphasize maximization. Galaty & Johnson [16] rightly articulate: "The essential pastoral strategy is probably neither maximization nor optimization, but risk aversion, which is an attempt to decrease uncertainty by anticipation. Domestic security is increased through creating alliances across ecological zones, distributing livestock among friends, securing rights in dry season pastures, increasing herds in anticipation of future losses. Short term tactics include punctuated movements to take advantage of new grass, depriving humans of milk to feed calves, or keeping animals within the home to increase security." Therefore, pastoral strategies are not viewed so much as directed towards maximizing animal numbers, but rather directed primarily towards securing a predictable food supply in a highly unpredictable environment [17]. Roe, Huntsinger & Labnow [18] argue: "[…] that the central concern of pastoralist is to manage a predictably unpredictable environment better, so as to establish a reliable flow of life-sustaining goods and services from rangeland ecosystems that are in fact an endogenous part of their production system." Moreover, the pastoralists are believed to be the experts at maximizing the use of rangelands, a capability demonstrated by numerous research studies [19]. According to Homewood [20], the pastoralists are only able to utilize marginal lands and they take only temporary advantage of richer areas with high rainfall, high nutrient forage or both.

Enclosure of Rangelands and Pastoralism

The scientists and managers have rarely conducted observational or experimental studies on habitat loss or fragmentation caused by human action in rangelands [21]. Landscape fragmentation may be defined as processes in which large continuous cover is subdivided into a number of smaller patches of smaller total area that are isolated from each other by a matrix of habitats [22]. These patches are unlike the original [23]. Some of the effects of fragmentation on landscape structure are: a decrease in the overall amount of habitat and mean patch size, incrementing of the edges, decrease of the core area and isolation of the habitat patches [23][24][25]. According to scholars, the very process of destruction or reduction in the quality of part of a habitat also breaks the habitat into pieces or fragments it, unless the entire habitat is lost [21]. When a linear feature is built in a rangeland (a road or a railway, for example), the principal process initiated is fragmentation, not loss or modification. Although very little of the landscape is lost or modified (under the road or rail bed), various species of animals (e.g. elephant) will change their behaviour and movement patterns because of the traffic on a road or rail [26]. Thus, the minor loss of habitat under the road or rail can cause modification and fragmentation of much of the surrounding habitat. The damages may be imagined if the destruction is landscape is of high magnitude.

Where pastoral (or at least livestock) interests are influential with government, as in Central Asia, Australia and parts of the New World, powerful administrative structures are established to prevent encroachment [7]. Otherwise, nowhere in the world do foraging peoples have the power to prevent their land being alienated [27]; if they have survived until now it is only because of their remoteness [7]. They also articulate that the foragers and pastoralists often live in overlapping territories, especially in Africa and Siberia. Prior to the 20th century, the land competition was not that intense and hence the two interlocking subsistence strategies could effectively co-exist. Today, the trend is reverse. With the increased human population densities and conversion of rangelands into other land uses, the pastoralists are under pressure to define their territories [7]. For example, in Siberia, the system of managing wild reindeer was transformed into a

system of herding within bound and fenced territories, thereby excluding Nenets hunting peoples. The Nenets were sedentarized. Similarly, the Kgalagadi, Herero and Ovimbundu herders in Botswana and Namibia were excluded by white people owned fenced ranches. As a consequence, they have been pushed into further incursions on the hunting territories of the Khoisan.

Moratorium to Nomadic Pastoralism and Rangeland-Based Economy

In preceding sections, it is well articulated that rangelands are the most ancient sources of subsistence economy in human history, and pastoral communities, especially nomadic pastoralists, are considered most sustainable societies in the world. However, in most countries rangelands are chiefly owned or controlled by governments with little recognition of communal tenures of agro-pastoral communities and their custodianship of local governance institutions. In large number of countries, a substantial area of rangelands has been privatized and managed by ranchers.

Despite awareness of the critical roles of rangelands in sustaining livelihoods of agro-pastoralists and ecological safeguarding, rangelands have felt the pressure of habitat fragmentation, land use change, industrialization, enclosure, privatization, militarization, and ecosystem devastation. The recent phenomenon of land grabbing has also affected the remaining rangelands and dependent pastoralism. Gradually, rangelands are being converted into other land uses or enclosed for exclusive uses under various national laws or policies. Worldwide, there is a common trend of declaring rangelands as wasteland or under-productive lands. In such context, pastoralism is often viewed as outdated and obsolete mode of food and agriculture production to give space for more intensive mode of agro-businesses. Thereafter, with the help of weak rangeland or pastures related laws/policies and by using powerful land acquisition or conversion laws/policies, countries either have given up massive rangeland territories to other forms of land uses or enclosed tenures or have restricted/ circumvented the grazing activities of pastoralist herders. Thus, by changing land use criteria, the results have been the exclusion of local herder communities, fragmentation of habitats, militarization of

territories, and enclosure of rangelands. This has affected the sustainability of both rangeland ecosystem services and viable pastoralism and transhumance.

Recently several studies have been undertaken to demonstrate that the nomadic pastoralist way (on rangelands) of livestock production with hardly any economic investment produces some of the most nutritive foods as well as other sustainable products (see also [13][16][19][20]). But despite such increasing evidence on the value of nomadic pastoralism, the dominant trend is to support intensive agro-business mode of development, even on fragile environment such as rangelands. Moreover, nomadic grazing (which is helpful to biodiversity, not detrimental) is often perceived by ecologists and conservationists as a threat to conservation. Many conservationists have advocated against grazing in natural ecosystems, especially in protected areas. This combination of market forces (agro-business) and conservation (protected areas) has led to a dramatic loss of access to rangelands for pastoralists.

Case of Hutsul Shepherd Communities of Ukraine

Ukrainian side of the Carpathian Mountains is home to about 20,000-25,000 people. In this region, sttlement of Hutsuls occupy the eastern part of the Ukrainian Carpathians: present day Verhovyna, Kosiv, southern part of Nadvirna and Bogorodchany districts of Ivano-Frankivsk oblast, adjacent Putyla and southern part of Vyzhnytsky and Storozhynets areas of Chernivtsi regions, and Rakhiv area of Transcarpathian regions. Livestock plays main role in Hutsul subsistence economy. They rear sheep, goats, horses, and dogs. The culture Polonyny (alpine meadows) economy has developed with a typical house types, forms of pastures, production functions of life, ways of processing of milk, making cheese and so on. In 1918, the territory of Yasinia had briefly appeared as Hutsul Republic. Hutsuls fought against the Hungary takeover. But, Romanian army in a battle defeated Hutsuls and captured Yasinia in 1919, and hence Hutsul Republic ended. The population of Hutsuls in Ukrainian territories continued to remain Ukrainians until today.

After the collapse of the Soviet Union and gaining independence in 1991, Ukraine underwent several significant reforms on privatisation and decentralisation, as well as the de-collectivisation of collective and state-owned farms. In 1992, there were 9350 collective farms (kolkhozes) and 4659 State-owned farms (sovkhozes) in Ukraine. Following the land reform in the country, the Land Code of Ukraine 2001 (amended 2017) recognizes three types of agricultural lands: corporate farms [17500 companies occupying 60% of agriculture land], peasant farms [43000 farms covering only 8% agriculture land] and household plots [5.3 million subsistence plots cover 30% agriculture land].

Like other former USSR nations, such as Kyrgyzstan, Kazakhstan, Uzbekistan, Mongolia, etc., Ukraine's land laws have not recognized "community tenures" on common land resources, and hence not adopted any "community-based pasture management system". In Kyrgyzstan, for example, responsibility and control over all types of pastures were delegated to a newly established institution: 'Pasture Users Associations' (PUAs) under Law of the Kyrgyz Republic no. 30 "On pastures" 2009 [28]. Such community institutions are mandated to take decisions that would be participatory and inclusive, with the intention that such decision-making mode would lead to greater equality in access to pastures and consequently to optimal stocking rates on different pastures ([29][30][31]. Although such elaborate legitimate systems have not evolved in Ukrainian agrarian laws, yet Hutsul herders' autonomy in pasture management increased significantly, following the dissolution of collective farms in Ukraine. Now Hutsul shepherds can choose numbers and the kinds of animals to collect from fellow villagers (in the case of hired herders); thus, their wage depends on the number of animals collected and their communication skills to negotiate favourable terms. But the legal provisions do not exist providing the communities autonomy and power to govern the grazing lands, alpine meadows and other collective territories. Hutsul community in Carpathian mountains of Ukraine, like many other pastoral people in the world, is deprived of communal tenure of grazing lands, which are *de facto* managed collectively with no de jure rights on such rangeland commons.

Restructuring the Paradigm and Policy of Rangeland Commons

Indisputably, resilience of pastoralist communities to the changing environments – ecological, economic and political – has great potential for protecting and conserving the rangeland landscapes or waterscapes. Though varied aspects of pastoralists' resilience have been documented mostly in context of climate change, resilience of nomadic pastoralists needs particularly to be studied and established in respect to drying water sources, changing vegetation composition, reducing fodder resources, degrading rangeland ecosystem, changing political or policy environment, militarization of rangelands, and alike. Certainly, the scientific studies of pastoralists' resilience and adaptation abilities would contribute to inclusive policy processes or reform meant for landscape conservation and management.

Beyond the question of resilience of pastoralism, documented scientific evidences will help minimize effects of policies and laws posing threats to the livelihoods and cultures of pastoralist communities and rangeland ecosystems by providing the data necessary to make informed decisions. This may reverse the trend of underestimating the value of rangeland ecosystems and pastoralist livelihoods by governance structures/bodies world over. But the bigger question is: what is the alternative paradigm, and how can the paradigm shift be realized?

Important is to examine built-in bias that lead to the general perception that rangeland ecosystems are unproductive or under-productive economically, though the ecological services of such ecosystems are not taken into account nor the economic production of the areas despite the lack of economic investment. The resilience of nomadic pastoralists and rangeland ecosystems to the changing environmental conditions need to be specifically addressed to gauge the advantages of conserving and preserving the rangelands and pastoralism together. It needs to be analyzed how the fragmentation, land use change and enclosure of rangelands physically or politically have accrued the economic, ecological and social losses, especially affecting the livelihoods of agro-pastoralists. Doing so will help compare the economic, social and environmental gains obtained from

conserved rangeland ecosystems and pastoralism, and from converted/enclosed/ fragmented rangelands (including other land use). It is expected to build strong case for pursuing inclusive policies of conserving the landscapes integrating rangelands and pastoralism as sustainable livelihood practice.

A comprehensive analysis on the meaning of nomadism and semi-nomadic uses of the rangeland is also necessary. Whilst lot of analysis on pastoralism is starting to emerge, there is usually a lack of analysis on the extent to which such pastoralism is still undertaken in a nomadic form or whether semi-sedentary forms of pastoralism are now dominant. Another important aspect that needs to be analyzed would be built in biases concerning the lifestyles of nomadic pastoralists and their symbiosis with rangelands. It should be tested through scientific evidence whether or not the livelihood and lifestyle of pastoralists are productive at par the neighbouring farmers.

A critical review of the national agrarian laws or conservation laws or local governance laws or pastoral policies is essential. In some countries, well structured government authorities manage the range systems and grazing affairs, while other countries lack proper governance systems around the pastoral lands despite related policies or laws in place. Along with many Asian countries (e.g. India, Iran, Kyrgyzstan, Uzbekistan, Kazakhstan, Tajikistan, Afghanistan, Mongolia, Tibet, Siberia), the Eastern Europe, especially Ukraine, should review and revise their pertinent laws, policies and governance frameworks for locating the strong loci and weak dots in relation to rangeland sustainability and pastoral grazing.

Paradigm shift is required not only for academics or government, but it is equally need for civil society or citizen groups. In fact, an intensive policy advocacy is required to be launched globally and regionally in support of sustainable pastoralist communities and the rangelands with which they interact. It has direct bearing on the suggested changes in legal/policy frameworks of various countries, as the national governments are guided and advised by international frameworks if such instruments are in place and enacted. Unfortunately, there is seldom any global policy or governance framework meant to advise nations for

conserving, preserving and managing rangelands sustainably with rightful existence for pastoral grazing. So, draft global governance on rangelands and pastoralism should be prepared and available in the public domain.

Conclusion

Subsistence pastoralism is sustainable strategy of livelihood and ecosystem conservation in the rangelands. By means of changing land use, exclusion of indigenous herder communities, fragmentation of habitats and militarization of territories, the enclosure of rangelands has affected the sustainability of both the rangeland ecosystem services and viable pastoralism and transhumance ways of subsistence livelihood. Resilience of indigenous pastoralist communities to the changing environments – ecological, economic and political – has great potential to protecting and conserving the rangeland landscapes or waterscapes. International and national policy frameworks are essential to enable the survival of rangeland ecology and economy. Viewing the fact that such frameworks do not largely exist, a shift in paradigm and policy frameworks would contribute to protection of rangelands and pastoralist communities. In this direction, an international legal framework would be most fruitful that may coordinate the domestic laws and policies regarding rangeland protection and management.

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Abstract

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[1] Moore [4], Groombridge [5] and Solbrig [6] define the rangelands as the grasslands, shrub lands, woodlands, wetlands, and deserts that are grazed by domestic livestock or wild animals. Types of rangelands include tall grass and short grass prairies, desert grasslands and shrub lands, woodlands, savannas, chaparrals, steppes, and tundras. Rangelands do not include forests, barren desert, farmland, or land covered by solid rock, concrete and/or glaciers. Rangelands are geographical regions dominated by grass and grass-like species with or without scattered woody plants, occupying between 18-23% of world land area excluding Antarctica [7].

than one billion people depend on livestock, and 70% of the 880 million rural poor living on less than US$ 1 per day are at least partially dependent on livestock [2]. Nomadic and transhumant pastoralists may number 100-200 million people globally[2]. The pastoralists are found in many parts of the world, including Africa, Central Asia, the Arctic, and southern & eastern Europe. The main livestock species kept by pastoralists are cattle, donkeys, goats and sheep, although they also keep, e.g., alpaca and llamas in the Andes, camels and horses in east-central Asia, the dromedary in Africa and West Asia, reindeer in northern Eurasia, and yak on the Tibetan Plateau and northeast India [1].

Scientifically, it is demonstrated that pastoralists and pastoralism make significant contributions to local, national and regional economies. Simel (2009) and Hesse (2009) demonstrated that pastoralism is considerably more productive per hectare than commercial ranching or sedentary livestock keeping in similar environmental conditions, and that the high productivity of livestock in pastoral systems not only supports millions of pastoralists but also contributes significantly to other sectors of national and regional economies [8][9]. The economists have estimated that pastoralists produce 10% of the world's meat, supporting nearly 200 million pastoral households who raise about 1 billion head of camel, cattle and smaller livestock [10]. Besides, the economic contribution of pastoralism, it is essential to understand how pastoralism differs from other lifestyles. Dyson-Hudson & Dyson-Hudson (1980) conceptualized nomadic pastoralism as the coexistence of dependence on livestock with spatial mobility [11]. Others narrate that the nomadic or mobile pastoralism has long been a sustainable livelihood in a diverse range of countries because of herders' ability to move and manage risk in marginal landscapes where domesticated animals efficiently convert limited ecological productivity into sustenance [12]. Pastoralists exert control over their animals based on their preferences for livestock's products they make a living of either directly, or indirectly, through the usage of products from domesticated animals [13]. Extensive livestock grazing is an excellent example of managing biodiversity and soil fertility. For example, through the transport of seeds and insects by livestock, the migration of pastoralists and their flocks supports habitat connectivity and biodiversity [14]. The mobile and less intensive use of natural resources is usually a better and more sustainable way to use nature, especially in fragile environment such as rangelands.

The pastoralism is usually the optimal subsistence pattern in critical ecosystems because it allows considerable independence from any local environment. When there is a drought, pastoralists disperse their herds or move them to new areas. On the contrary, farmers rarely have such options. They suffer crop failure and starvation in the same situation. A pastoral subsistence pattern reduces the risk when there is an irregular climatic pattern[3]. Thus, the key to pastoralism is mobility, which permits temporary exploitation of resources that are not sufficient to sustain a human and herbivore population for an entire year[4]. A host of features of nomadic life reflect the demands and costs of mobility and of dependence on herds of animals [to convert the energy stored in grasses to the milk, meat and wool] that feed the human population. So, pastoralist societies commonly develop a conscious and explicit nomadic ethos, which values mobility and

[2] World Initiative for Sustainable Pastoralism: www.iucn.org/wisp/
[3] http://anthro.palomar.edu/subsistence/default.htm
[4] http://countrystudies.us/mongolia/

the ability to cope with problems by moving away from threats or toward resources and which disparages permanent settlement, cultivation of the soil, and accumulation of objects[5].

Adaptation strategies adopted by nomadic pastoralists are talked high by scientists. According to McCabe [15], pastoral management strategies are best understood as rigged towards risk aversion rather than strategies that emphasize maximization. Galaty & Johnson [16] rightly articulate: "The essential pastoral strategy is probably neither maximization nor optimization, but risk aversion, which is an attempt to decrease uncertainty by anticipation. Domestic security is increased through creating alliances across ecological zones, distributing livestock among friends, securing rights in dry season pastures, increasing herds in anticipation of future losses. Short term tactics include punctuated movements to take advantage of new grass, depriving humans of milk to feed calves, or keeping animals within the home to increase security." Therefore, pastoral strategies are not viewed so much as directed towards maximizing animal numbers, but rather directed primarily towards securing a predictable food supply in a highly unpredictable environment [17]. Roe, Huntsinger & Labnow [18] argue: "[…] that the central concern of pastoralist is to manage a predictably unpredictable environment better, so as to establish a *reliable* flow of life-sustaining goods and services from rangeland ecosystems that are in fact an endogenous part of their production system." Moreover, the pastoralists are believed to be the experts at maximizing the use of rangelands, a capability demonstrated by numerous research studies [19]. According to Homewood [20], the pastoralists are only able to utilize marginal lands and they take only temporary advantage of richer areas with high rainfall, high nutrient forage or both.

Enclosure of Rangelands and Pastoralism

The scientists and managers have rarely conducted observational or experimental studies on habitat loss or fragmentation caused by human action in rangelands [21]. Landscape fragmentation may be defined as processes in which large continuous cover is subdivided into a number of smaller patches of smaller total area that are isolated from each other by a matrix of habitats [22]. These patches are unlike the original [23]. Some of the effects of fragmentation on landscape structure are: a decrease in the overall amount of habitat and mean patch size, incrementing of the edges, decrease of the core area and isolation of the habitat patches [23][24][25]. According to scholars, the very process of destruction or reduction in the quality of part of a habitat also breaks the habitat into pieces or fragments it, unless the entire habitat is lost [21]. When a linear feature is built in a rangeland (a road or a railway, for example), the principal process initiated is fragmentation, not loss or modification. Although very little of the landscape is lost or modified (under the road or rail bed), various species of animals (e.g. elephant) will change their behaviour and movement patterns because of the traffic on a road or rail [26]. Thus, the minor loss of habitat under the road or rail can cause modification and fragmentation of much of the surrounding habitat. The damages may be imagined if the destruction is landscape is of high magnitude.

Where pastoral (or at least livestock) interests are influential with government, as in Central Asia, Australia and parts of the New World, powerful administrative structures are established to prevent encroachment [7]. Otherwise, nowhere in the world do foraging peoples have the power

[5] http://countrystudies.us/mongolia/

to prevent their land being alienated [27]; if they have survived until now it is only because of their remoteness [7]. They also articulate that the foragers and pastoralists often live in overlapping territories, especially in Africa and Siberia. Prior to the 20th century, the land competition was not that intense and hence the two interlocking subsistence strategies could effectively co-exist. Today, the trend is reverse. With the increased human population densities and conversion of rangelands into other land uses, the pastoralists are under pressure to define their territories [7]. For example, in Siberia, the system of managing wild reindeer was transformed into a system of herding within bound and fenced territories, thereby excluding Nenets hunting peoples. The Nenets were sedentarized. Similarly, the Kgalagadi, Herero and Ovimbundu herders in Botswana and Namibia were excluded by white people owned fenced ranches. As a consequence, they have been pushed into further incursions on the hunting territories of the Khoisan.

Moratorium to Nomadic Pastoralism and Rangeland-Based Economy

In preceding sections, it is well articulated that rangelands are the most ancient sources of subsistence economy in human history, and pastoral communities, especially nomadic pastoralists, are considered most sustainable societies in the world. However, in most countries rangelands are chiefly owned or controlled by governments with little recognition of communal tenures of agro-pastoral communities and their custodianship of local governance institutions. In large number of countries, a substantial area of rangelands has been privatized and managed by ranchers.

Despite awareness of the critical roles of rangelands in sustaining livelihoods of agro-pastoralists and ecological safeguarding, rangelands have felt the pressure of habitat fragmentation, land use change, industrialization, enclosure, privatization, militarization, and ecosystem devastation. The recent phenomenon of land grabbing has also affected the remaining rangelands and dependent pastoralism. Gradually, rangelands are being converted into other land uses or enclosed for exclusive uses under various national laws or policies. Worldwide, there is a common trend of declaring rangelands as wasteland or under-productive lands. In such context, pastoralism is often viewed as outdated and obsolete mode of food and agriculture production to give space for more intensive mode of agro-businesses. Thereafter, with the help of weak rangeland or pastures related laws/policies and by using powerful land acquisition or conversion laws/policies, countries either have given up massive rangeland territories to other forms of land uses or enclosed tenures or have restricted/ circumvented the grazing activities of pastoralist herders. Thus, by changing land use criteria, the results have been the exclusion of local herder communities, fragmentation of habitats, militarization of territories, and enclosure of rangelands. This has affected the sustainability of both rangeland ecosystem services and viable pastoralism and transhumance.

Recently several studies have been undertaken to demonstrate that the nomadic pastoralist way (on rangelands) of livestock production with hardly any economic investment produces some of the most nutritive foods as well as other sustainable products (see also [13][16][19][20]). But despite such increasing evidence on the value of nomadic pastoralism, the dominant trend is to support intensive agro-business mode of development, even on fragile environment such as rangelands. Moreover, nomadic grazing (which is helpful to biodiversity, not detrimental) is often perceived by ecologists and conservationists as a threat to conservation. Many

conservationists have advocated against grazing in natural ecosystems, especially in protected areas. This combination of market forces (agro-business) and conservation (protected areas) has led to a dramatic loss of access to rangelands for pastoralists.

Case of Hutsul Shepherd Communities of Ukraine

Ukrainian side of the Carpathian Mountains is home to about 20,000-25,000 people. In this region, sttlement of Hutsuls occupy the eastern part of the Ukrainian Carpathians: present day Verhovyna, Kosiv, southern part of Nadvirna and Bogorodchany districts of Ivano-Frankivsk oblast, adjacent Putyla and southern part of Vyzhnytsky and Storozhynets areas of Chernivtsi regions, and Rakhiv area of Transcarpathian regions. Livestock plays main role in Hutsul subsistence economy. They rear sheep, goats, horses, and dogs. The culture Polonyny (alpine meadows) economy has developed with a typical house types, forms of pastures, production functions of life, ways of processing of milk, making cheese and so on. In 1918, the territory of Yasinia had briefly appeared as Hutsul Republic. Hutsuls fought against the Hungary takeover. But, Romanian army in a battle defeated Hutsuls and captured Yasinia in 1919, and hence Hutsul Republic ended. The population of Hutsuls in Ukrainian territories continued to remain Ukrainians until today.

After the collapse of the Soviet Union and gaining independence in 1991, Ukraine underwent several significant reforms on privatisation and decentralisation, as well as the de-collectivisation of collective and state-owned farms. In 1992, there were 9350 collective farms (kolkhozes) and 4659 State-owned farms (sovkhozes) in Ukraine. Following the land reform in the country, the Land Code of Ukraine 2001 (amended 2017) recognizes three types of agricultural lands: corporate farms [17500 companies occupying 60% of agriculture land], peasant farms [43000 farms covering only 8% agriculture land] and household plots [5.3 million subsistence plots cover 30% agriculture land].

Like other former USSR nations, such as Kyrgyzstan, Kazakhstan, Uzbekistan, Mongolia, etc., Ukraine's land laws have not recognized "community tenures" on common land resources, and hence not adopted any "*community-based pasture management system*". In Kyrgyzstan, for example, responsibility and control over all types of pastures were delegated to a newly established institution: 'Pasture Users Associations' (PUAs) under Law of the Kyrgyz Republic no. 30 "On pastures" 2009 [28]. Such community institutions are mandated to take decisions that would be participatory and inclusive, with the intention that such decision-making mode would lead to greater equality in access to pastures and consequently to optimal stocking rates on different pastures ([29][30][31]. Although such elaborate legitimate systems have not evolved in Ukrainian agrarian laws, yet Hutsul herders' autonomy in pasture management increased significantly, following the dissolution of collective farms in Ukraine. Now Hutsul shepherds can choose numbers and the kinds of animals to collect from fellow villagers (in the case of hired herders); thus, their wage depends on the number of animals collected and their communication skills to negotiate favourable terms. But the legal provisions do not exist providing the communities autonomy and power to govern the grazing lands, alpine meadows and other collective territories. Hutsul community in Carpathian mountains of Ukraine, like many other pastoral people in the world, is deprived of communal tenure of grazing lands, which are *de facto* managed collectively with no *de jure* rights on such rangeland commons.

Restructuring the Paradigm and Policy of Rangeland Commons

Indisputably, resilience of pastoralist communities to the changing environments – ecological, economic and political – has great potential for protecting and conserving the rangeland landscapes or waterscapes. Though varied aspects of pastoralists' resilience have been documented mostly in context of climate change, resilience of nomadic pastoralists needs particularly to be studied and established in respect to drying water sources, changing vegetation composition, reducing fodder resources, degrading rangeland ecosystem, changing political or policy environment, militarization of rangelands, and alike. Certainly, the scientific studies of pastoralists' resilience and adaptation abilities would contribute to inclusive policy processes or reform meant for landscape conservation and management.

Beyond the question of resilience of pastoralism, documented scientific evidences will help minimize effects of policies and laws posing threats to the livelihoods and cultures of pastoralist communities and rangeland ecosystems by providing the data necessary to make informed decisions. This may reverse the trend of underestimating the value of rangeland ecosystems and pastoralist livelihoods by governance structures/bodies world over. But the bigger question is: what is the alternative paradigm, and how can the paradigm shift be realized?

Important is to examine built-in bias that lead to the general perception that rangeland ecosystems are unproductive or under-productive economically, though the ecological services of such ecosystems are not taken into account nor the economic production of the areas despite the lack of economic investment. The resilience of nomadic pastoralists and rangeland ecosystems to the changing environmental conditions need to be specifically addressed to gauge the advantages of conserving and preserving the rangelands and pastoralism together. It needs to be analyzed how the fragmentation, land use change and enclosure of rangelands physically or politically have accrued the economic, ecological and social losses, especially affecting the livelihoods of agro-pastoralists. Doing so will help compare the economic, social and environmental gains obtained from conserved rangeland ecosystems and pastoralism, and from converted/enclosed/ fragmented rangelands (including other land use). It is expected to build strong case for pursuing inclusive policies of conserving the landscapes integrating rangelands and pastoralism as sustainable livelihood practice.

A comprehensive analysis on the meaning of nomadism and semi-nomadic uses of the rangeland is also necessary. Whilst lot of analysis on pastoralism is starting to emerge, there is usually a lack of analysis on the extent to which such pastoralism is still undertaken in a nomadic form or whether semi-sedentary forms of pastoralism are now dominant. Another important aspect that needs to be analyzed would be built in biases concerning the lifestyles of nomadic pastoralists and their symbiosis with rangelands. It should be tested through scientific evidence whether or not the livelihood and lifestyle of pastoralists are productive at par the neighbouring farmers.

A critical review of the national agrarian laws or conservation laws or local governance laws or pastoral policies is essential. In some countries, well structured government authorities manage the range systems and grazing affairs, while other countries lack proper governance systems around the pastoral lands despite related policies or laws in place. Along with many Asian countries (e.g. India, Iran, Kyrgyzstan, Uzbekistan, Kazakhstan, Tajikistan, Afghanistan, Mongolia, Tibet, Siberia), the Eastern Europe, especially Ukraine, should review and revise their

pertinent laws, policies and governance frameworks for locating the strong loci and weak dots in relation to rangeland sustainability and pastoral grazing.

Paradigm shift is required not only for academics or government, but it is equally need for civil society or citizen groups. In fact, an intensive policy advocacy is required to be launched globally and regionally in support of sustainable pastoralist communities and the rangelands with which they interact. It has direct bearing on the suggested changes in legal/policy frameworks of various countries, as the national governments are guided and advised by international frameworks if such instruments are in place and enacted. Unfortunately, there is seldom any global policy or governance framework meant to advise nations for conserving, preserving and managing rangelands sustainably with rightful existence for pastoral grazing. So, draft global governance on rangelands and pastoralism should be prepared and available in the public domain.

Conclusion

Subsistence pastoralism is sustainable strategy of livelihood and ecosystem conservation in the rangelands. By means of changing land use, exclusion of indigenous herder communities, fragmentation of habitats and militarization of territories, the enclosure of rangelands has affected the sustainability of both the rangeland ecosystem services and viable pastoralism and transhumance ways of subsistence livelihood. Resilience of indigenous pastoralist communities to the changing environments – ecological, economic and political – has great potential to protecting and conserving the rangeland landscapes or waterscapes. International and national policy frameworks are essential to enable the survival of rangeland ecology and economy. Viewing the fact that such frameworks do not largely exist, a shift in paradigm and policy frameworks would contribute to protection of rangelands and pastoralist communities. In this direction, an international legal framework would be most fruitful that may coordinate the domestic laws and policies regarding rangeland protection and management.

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