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## PASTORALIST PARTICIPATION AND NETWORKING IN POLICY DIALOGUE: DIMENSIONS AND CHALLENGES

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### 1. Introduction

Pastoralists have a unique relationship of mutual dependency with their livestock and their environment; the uniqueness of this relationship distinguishes them from other livestock keepers. They depend highly on the environment where they develop their livelihood, that they make productive through highly adapted animals, but at the same time the quality of this environment depends on how well they take care of it, which in turns depends on complex social regulations and on large-scale mobility. The way they keep their animals forms part of their daily life and of a complex culture. Pastoralism is widely understood as an extensive livestock production system in the rangelands, with mobility as one of its distinguishing characteristics. Mobility enables the pastoralists to inhabit lands that are considered otherwise marginal, scattered and unproductive. Relying on common property resources, reducing risks and increasing resilience greatly increases the productivity of herds in the highly heterogeneous landscapes that pastoralists make their living on. Concentrations of pastoralist populations can thus be found in areas with extreme temperatures, highly variable rainfall and difficult environments that are largely unsuitable for agriculture. For centuries, pastoralists achieved a social, cultural, environmental and economic balance in these unpredictable ecosystems by developing highly adaptable and sustainable livestock production systems.<sup>1</sup>

Moreover, pastoralists are universally acknowledged as custodians of rangelands. It is estimated that pastoralism is practised in more than 75 per cent of the world's countries and in more than half of the world's land, including areas of drylands, taigas, tundras and many mountain landscapes. It also safeguards natural capital

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<sup>1</sup> Pastoralist systems are often described as low-input, low-output, these terms being based on an agricultural/ecological perspective. Pastoralism needs lower or nil inputs of fertilizer, mechanized work and fossil fuel and external provision fodder. It also yields a lower production volume per hectare or animal than other, more intensive, systems. However, using such terminology can be confusing because pastoralist systems are actually high-input, high-output both in terms of human capital – as they need higher manpower and also provide more jobs – and of economic capital – as they need investments but they yield products of very high added value.

in over 25 per cent of the world's area.<sup>2</sup> This indicates that pastoralism, as a food production system in otherwise unproductive regions, contributes immensely to the food security of millions of people. Furthermore, there is significant evidence to support the role of pastoralism in providing substantial ecosystem services, such as the maintenance of biodiversity, the performance of key ecosystem functions and carbon sequestration in rangelands.<sup>3</sup> It is estimated that improved grazing management of the world's 5 billion rangeland hectares could roughly sequester the equivalent of 9.8 per cent of annual anthropogenic carbon emissions each year.<sup>4</sup> Due to their traditional role as custodians of important ecosystems and their associated services, pastoralists are needed in the global policy dialogue on related issues. Management of natural resources, as well as development and food security policies, have benefited in recent years from an increased dialogue with civil society. Policymakers have understood that it is extraordinarily challenging to promote policies that were formulated without the prior agreement of local communities. They have also belatedly understood that they have much to learn on the customary practices of pastoralist communities. Not unsurprisingly, awareness and a focus and interest on traditional ecological knowledge has been steadily growing, including among pastoralist communities, in recent decades.

However, pastoralists remain largely unheard and unseen due to their mobility with livestock in search of pastures, water sources and markets. The current dominant narratives on pastoralism fail to acknowledge their contributions to society, economy and environment. As a result, they do not find representation in the development, economic or environmental policies of most countries. Notably, there is no accurate estimation of how many pastoralists there are in the world due to the unavailability of reliable sources to consult and no consistent definition of who is defined as a 'pastoralist'. However, it is thought that there are between 100 and 500 million pastoralists in the world.

Furthermore, they are perceived as being responsible for conflicts and environmental degradation due to restrictions in their mobility or disruptions of communal land tenure, and positive stories highlighting the social, economic and environmental benefits of pastoralism are extremely rare. Researchers working with pastoralists agree that *"the dominant policy narratives cast pastoralism as a backward, wasteful and irrational livelihood that takes place in fragile, degraded and unproductive ecosystems and creates a catalogue of problems for non-pastoralists. The narratives frame pastoralism as something that should be replaced, because it is uneconomic, archaic and ungovernable. They frame pastoralists as lazy, poor and at times criminal and dangerous. And they portray the mobility that makes pastoralism possible as problematic, random, and unproductive and a cause of conflict and disease."*<sup>5</sup>

Pastoralism has generally been excluded from existing narratives on livestock production systems, both in policy and in agronomic education and science. This limited discourse not only fails to give credit to pastoralism for its socio-eco-environmental contributions, but also impairs its natural resource efficiency and sustainability.

Pastoralism is under extreme duress all over the world. An increasing number of pastoralists are being forced to give up livestock keeping because it is no longer viable, resulting in a reduction of herd sizes in response to threats to their livelihood.

2 McGahey, D., Davies, J., Hagelberg, N., and Ouedraogo, R. (2014). Pastoralism and the green economy – a natural nexus? Nairobi: IUCN and UNEP. Available at: [http://cmsdata.iucn.org/downloads/wisp\\_green\\_economy\\_book.pdf](http://cmsdata.iucn.org/downloads/wisp_green_economy_book.pdf)

3 Hoffmann, I., From, T. and Boerma, D. (2014). Ecosystem services provided by livestock species and breeds, with special consideration to the contributions of small-scale livestock keepers and pastoralists. FAO Commission on Genetic Resources for Food and Agriculture. Background study paper no. 66. Available at: <http://www.fao.org/3/a-at598e.pdf>

4 McGahey et al., op.cit.

5 Shanahan, M. (2013). Media perceptions and portrayals of pastoralists in Kenya, India and China. IIED. Gatekeeper series no. 154. Available at: <http://pubs.iied.org/pdfs/14623IIED.pdf>



These threats are mainly the result of increased obstacles to mobility, disruption of communal tenure, reduced access to pastures due to land grabs, fluctuating climatic conditions and market distortions. Remarkably, during recent field work in Kutch, Gujarat, undertaken by one of the authors of this paper, it was not uncommon to find 1-2 pastoralists families in pastoral villages who no longer keep any livestock at all. It was once implausible and even inconceivable for a pastoralist to live without livestock, but this has emerged as a clear trend around the world. In order to hold onto their dignity, all pastoralists would feel obliged to have at least a few goats or a cow. Often, the lack of a formal education and any other life-skills severely challenges their livelihood opportunities, as well as compromising their ability to reclaim their rights. If this continues it will affect their ability to achieve the Sustainable Development Goals (SDGs) that have direct relevance to them, for example, SDG1 aims to end poverty but with decreased livelihood opportunities this will become harder for pastoralists to obtain. The Global Donor Working Group on Land has recently expressed strong support for the inclusion of a global land rights indicator to verify the achievement of the goals.<sup>6</sup> This would help to ensure that pastoralists are given the appropriate consideration by governments and other bodies by highlighting their importance in relation to the SDGs.

## 2. Historical challenges for pastoralist voices

Pastoralists remain outside mainstream social networks and discourse and rarely benefit from government infrastructure and development policies. The reasons for this range from a lack of understanding of pastoralist culture, to a narrow-focused approach towards development, but the consequences are inevitably negative and contribute to poverty and environmental degradation.<sup>7</sup> Firstly, they have not been considered to be important actors in development, which has led to insufficient attention to their current situation, as well as few attempts to find solutions to guarantee their rights. Secondly, as discussed above, the negative narrative on them in recent history has led to interventions aimed at disrupting the livelihoods of pastoralists. There are many examples from across the globe of pastoralists that have been evicted from the land they have lived on for centuries. These evictions are due to attempts to convert pastures into crop lands, or to occupy them with mining projects, or to create wildlife sanctuaries, reserve forests, dams, power plants, railways, roads, or simply to develop those lands for industrial production. Pastoralists have been forced, or persuaded, to become sedentary with no thought given to their history, culture or lifestyles. All this has been done in the absence of any scientific analysis on the benefits of sustainable pastoralism on rangeland and dryland ecosystem management.

Recent analysis on pastoralism in Tibet reports that "*the forest villagers are steadily increasing their land tenure security, while the pastoralists of the Tibetan (and Inner Mongolian) grasslands are steadily losing their land tenure rights. And all rural land users now face the prospect of their land becoming a tradable commodity, in circumstances favouring the rich against the poor, who are unable to borrow money to buy land. Not only are Tibetan pastoralists losing land security at a time when others are gaining it, they gain nothing from the miners who move in.*"<sup>8</sup> This is a further reflection on the poor understanding of policymakers and land planners on pastoral land tenure systems. The privatization of pastoral zones is eroding their customary rights and their resilience to climate fluctuations. It is the main reason for the trend towards the extinction of pastoralism in many regions.

6 Global Donor Platform for Rural Development (2015). Crucial land rights indicator for the Post-2015 SDGs. Platform Policy Brief No. 11, September. Available at: <https://www.donorplatform.org/land-governance/latest/1453-global-working-group-on-land-endorses-a-global-land-rights-indicator>

7 Leloup, S. (2006). Investing in maintaining mobility in pastoral systems of the arid and semi-arid regions of sub-Saharan Africa. ALive: Partnership for Livestock Development, Poverty Alleviation and Sustainable Growth. 13 p. [http://www.fao.org/fileadmin/templates/lead/pdf/e-conf\\_06-10\\_mobility.pdf](http://www.fao.org/fileadmin/templates/lead/pdf/e-conf_06-10_mobility.pdf)

8 Tibetan Centre for Human Rights and Democracy (2015). Wasted lives: A critical analysis of China's campaign to end Tibetan pastoral lifeways, P.125. Available at: <http://www.tchrd.org/wp-content/uploads/2015/05/Download-Report.pdf>



Pastoralist societies have their own customary norms to govern their society, policies and economics. They have largely remained outside mainstream governance processes and systems due to their mobility, as a result of having successfully maintained more or less independent production systems. This is especially true after the industrial revolution when power was concentrated in large sedentary centres. However, global and national policies on land, livestock products and other natural resources are drastically changing and pastoralists cannot remain excluded from the dialogues and decisions which affect or threaten their existence. Until a few years ago 'pastoralists' were not even identified as a separate development constituency in the same way as crop farmers, fisher folks, women or youth. Livestock keeping has generally been considered a part of farming systems, so the specific issues of small livestock keepers and pastoralists were not understood, acknowledged or taken into account in policy-making. Additionally, pastoralist representation has remained weak at both the national and global level. This can be attributed to their historical isolation and their lack of access to formal education, communication technology, information and social services – there are extremely few examples of primary education being delivered to pastoralist communities without entering a sedentarization loop,<sup>9</sup> and none of secondary education.<sup>10</sup> As a result, pastoralists are also not as well organized as other constituencies, and there is currently no global alliance that exclusively represents pastoralists and their issues, and only a few organizations that work exclusively with them. This is due in part to the fact that pastoralist leaders cannot be reached through modern communications technology as the leaders of other constituencies can. Moreover, there are often language barriers and passport/travel permit issues that affect their ability to participate in policy dialogues at the national and regional or subregional level. The lack of recognition and acknowledgement of pastoralists as an important constituency has resulted in limited funds and donor commitment to support their participation in relevant meetings and dialogues. For these reasons, pastoralist representation and participation has remained weak.

### 3. Pastoralist participation

The question of participation is important as this recognizes pastoralists as an important constituency that can substantially contribute to sustainable development. Pastoralists face greater barriers to participation than other constituencies as a result of their complex customary societies and livelihood patterns, which depend on mobility and on distant, poorly linked territories. Thus, they have been more overtly excluded than other producers and either are not entitled to receive investments or basic services, or have less access to socially accepted mechanisms to exercise their entitlements. The prevalent narratives about pastoralists create negative and contradictory interpretations of their activities. This makes it even more difficult for them to get the respect and recognition that other development actors receive.

In addition to participation, representation is also an important issue. Often, pastoralist representatives are not pastoralists themselves, but are those who have better access to communication technology, know more languages and can travel to attend meetings. Subsequently, they get more opportunities to represent pastoralists in policy dialogues. There are arguments both in favour of and against this kind of representation. Pastoralist issues can be misrepresented unless there is a strong process to identify their representatives and determine their ownership of the decision making process that affects them and its accountability.

9 Kratli, S. and Dyer, C. (2009) Mobile Pastoralists and Education: Strategic Options. Education for Nomads, Working Paper 1. London: International Institute for Environment and Development. <http://pubs.iied.org/10021IIED.html>

10 Schelling, E. Wiebel, D. and Bonfoh, B. (2008) Learning from the Delivery of Social Services to Pastoralists: elements of good practise. WISP-IUCN, Nairobi. [http://cmsdata.iucn.org/downloads/social\\_services\\_to\\_pastoralists\\_english\\_2.pdf](http://cmsdata.iucn.org/downloads/social_services_to_pastoralists_english_2.pdf)



However, it can often be worse if there is no representation at all. In any case, experience tells us that pastoralists are very strong when it comes to political representation, but that they need the support of technical experts to better structure their experiences, customary knowledge and arguments to engage in effective policy discourses.

Traditional ecological knowledge (TEK) is very strong among pastoralists due to their reliance on natural resources to provide for their livestock and families throughout the seasons. Given that TEK is acquired through trial-and-error methods that have been refined over generations and that pastoralists are primarily looking for correlations rather than causes, they do not necessarily understand the technical reasons underlying cultural practices. The lack of understanding of these technicalities makes an effective policy dialogue very difficult. They also need the support of scientists and experts to read and understand the implications of ongoing research outcomes and to link orthodox science to their daily observations and to the traditional knowledge they have acquired over generations. This will enable the development of evidence-based arguments and help pastoralists to be better understood by other stakeholders, local authorities and government entities.

According to the Food and Agriculture Organization (FAO), growing populations, rising affluence and urbanization are translating into an increased demand for livestock products, particularly in developing countries. Global demand is projected to increase by 70 per cent in order to feed a population that is estimated to reach 9.6 billion by 2050.<sup>11</sup> In the past 4 to 5 years there has been an increased focus on the livestock sector due to increased recognition of its role in global food security and its impact on the environment. The debate on the impact of livestock on the environment started with the release of the report *Livestock's Long Shadow: Environmental Issues and Options* in 2006.<sup>12</sup> The report stated that the livestock sector is one of the top two or three most significant contributors to the most serious environmental problems, at every scale, from local to global. The report used the Life Cycle Analysis (LCA) approach to estimate "that livestock are responsible for 18 per cent of greenhouse gas (GHG) emissions, a bigger share than that of transport." More recent estimates based on LCA, in 2013 FAO's issued a report, *Tackling climate change through livestock*,<sup>13</sup> that set the contribution of the livestock sector at 14.5 per cent of human-induced GHG emissions.

The pastoralist and traditional livestock keepers, whose representatives were confronted with these results during the Global Gathering of Pastoralists in Kiserian, Kenya (December 2013), argued that such research approaches do not fairly take into account the extensive production systems, such as the pastoralist production system, used by pastoralists. This is mainly because pastoralists are not a part of the discussions where the problems are defined and the scientists specializing in such systems are not a part of the teams conducting the research. Hence, the research outcomes depict results and conclusions that may be valid for industrial livestock systems, but not representative of a whole range of other livestock production systems. It has similarly been observed that the research studies have mainly focused on the Global North but that, typically, their findings are also prescribed for the Global South. In fact, there are insufficient efforts to find, and ensure the participation of, experts in backyard or extensive livestock production systems from the Global South who either represent pastoralists or bring the viewpoints of pastoralist systems into scientific discussions and committees.

11 See: <http://www.fao.org/livestock-environment/en/>

12 See: <http://www.fao.org/docrep/010/a0701e/a0701e00.HTM>

13 See: <http://www.fao.org/docrep/018/i3437e/i3437e.pdf>





Increasingly, over the past 3 to 5 years, more space and opportunities has been created specifically for pastoralists to participate in global policy dialogues. However, the participation of pastoralists has remained inadequate for a multitude of reasons. Often, pastoralists are invited to participate in meetings and events without funding support for translations, thus greatly limiting their effective participation. They have to either mobilize their own resources for interpreters or rely on random support from volunteers.

Another challenge is the continuity of pastoralists or their representatives in these dialogues. This is predominantly because pastoralist organizations and their alliances are not organized at the national and regional levels. As mentioned before, there is no global network exclusively made of pastoralists and their organizations. The World Alliance for Mobile Indigenous Peoples (WAMIP) is the alliance with the largest number of pastoralist communities and representatives, from over 50 countries. However, it still needs to strengthen its mechanisms and build capacity of the regional alliances in order to participate effectively in policy dialogues.

The ultimate aim of participation is to introduce policies that benefit everyone, including the excluded and marginalized. Participation of pastoralists needs to be strengthened in both the development and implementation of policies. This participation is necessary in order to assist in defining the issues, formulating possible solutions, and implementing measures that have been adopted and, finally, engaging in follow-up activities and evaluation. For this purpose, several agencies such as IIED and ILC have been working, for some years, in strengthening the capacity of pastoralists to engage in policy dialogue. The most relevant of these efforts may be IUCN's World Initiative for Sustainable Pastoralism (WISP),<sup>14,15</sup> from whose experience many of the lessons presented in this paper originate. Through a combination of knowledge gathering, support to pastoralist networking and evidence-based policy advocacy in key global fora, WISP has significantly increased the relevance of the technical arguments in support of pastoralism, in a serious effort to empower pastoralists.<sup>16</sup>

The recently launched Pastoralist Knowledge Hub (Hub),<sup>17</sup> an initiative hosted by FAO and supported by other agencies such as UNEP and IFAD, is an opportunity to help pastoralists organize and strengthen their regional processes, create a knowledge base and to systematically support policy advocacy. As of August 2015, the Hub has supported regional meetings of pastoralists in South Asia, Central Asia, Latin America and Europe. Meetings in East and South Africa, West and Central Africa, North Africa and the Middle East are being organized. One of the outcomes of these meetings is the establishment of regional Civil Society Mechanisms of pastoralists and their organizations, which are characterized by transparency, inclusion, gender and geographic balance, diversity and innovation. However, these regional alliances will need long-term follow-up and support from those in need of the pastoralist voice in order to enable effective and continued participation of pastoralists.

14 Manzano, P.; Ng'eny, N.; Davies, J. (2011). Changing mentalities towards pastoralism across scales: the World Initiative for Sustainable Pastoralism and other related initiatives. IX International Rangeland Congress. Rosario (Argentina), pp: 760-765. Available at: <http://www.ciudadesferica.com/demo/congreso/pdfs/3.4/760.pdf>

15 Manzano, P.; Ngeny, N.; Davies, J. (2010). La Iniciativa Mundial por un Pastoralismo Sostenible (IMPS) y la importancia económica, social y ambiental de los pastores a nivel global. II Congreso Nacional de Vías Pecuarias, Cáceres, Spain, pp: 336-343. Available at: [http://www.pastos.es/pdf/Manzano\\_et\\_al\\_2010\\_WISP.pdf](http://www.pastos.es/pdf/Manzano_et_al_2010_WISP.pdf)

16 de Jode, H. (2014). The Green Quarter: A decade of progress across the world in sustainable pastoralism. Nairobi: IUCN. viii+52pp. Available at: [http://cmsdata.iucn.org/downloads/10\\_year\\_book\\_low\\_res.pdf](http://cmsdata.iucn.org/downloads/10_year_book_low_res.pdf)

17 See: <http://www.fao.org/pastoralist-knowledge-hub/en/>



## a. Participation benefits for pastoralists

Participation of pastoralist representatives, or of pastoralists themselves, in dialogue processes comes at a cost to them. Those participating in these processes have to dedicate time to prepare and attend dialogue opportunities – time which would otherwise be spent on their livelihoods or with their families. For representation to be effective, appointed representatives usually have to be paid for their time. This means that there have to be clear and tangible benefits in order for pastoralists to engage in these processes.

Pastoralists who attend meetings, and meet representatives of pastoralists from other places, often very distant from their communities, can gain huge benefits from this experience. Thus, over the past decade WISPs support of these events has had very significant effects for the participants.<sup>18</sup> By meeting other pastoralists they have the opportunity to share good practices that have enhanced their livelihood opportunities and think about how to adapt these to their local environment and their realities. Such exchanges have helped to mainstream practices, such as the indigenous-led conservation areas. In these meetings they also have the opportunity to share experiences and views with colleagues that may be living in distant places, but that share many similar issues or strategies. The potential for this is to create joint ventures for some key activities by attaining a critical mass that allows, for example for market up-scaling or joint product advertisement. A good example of this is of pastoralists producing fine fibre. Individually, they only produce small quantities and are scattered over several continents. However, if they grouped together they could potentially achieve greater benefits. Comprehensive work has also been developed on sharing good practices at restoring collective land management. This has helped pastoralist organizations to restore sustainable practices.<sup>19,20,21</sup>

A more direct proven benefit is joint advocacy. This helps to disseminate messages more widely, thereby providing increased visibility to issues, such as the mining and extractive activities, which in many cases cause immense damage to rangelands, as well as land grabbing for development, which has had devastating effects on the mobility of pastoralists and their access to pastures and water resources. By engaging in dialogue, pastoralists can also access up-to-date evidence on pastoralism, thereby removing misconceptions about their economic efficiency and environmental destructiveness. These misconceptions are sometimes rooted even within their own communities, a result of the heavy pressure exerted by the mainstream discourse. Once pastoralists understand these technical arguments they are the best advocates for themselves, as they easily translate their community-level observations into technical knowledge. Changing this narrative may positively influence policymakers to begin valuing the contributions of pastoralism and consider their benefits before allocating rangelands for industry, or any other purpose currently perceived as a more productive use of land.

## b. Benefits of participation to society

Society at large also benefits directly from an increased participation of pastoralists in policy dialogue. Here, the provision of services by pastoralism is key, as this livelihood efficiently utilizes lands that are not suited for agricultural production (e.g. mountain and arid lands), and is able to produce food of extraordinary nutritional and economic value. Participation of pastoralists in dialogue processes will protect the provision of these services in the future.

18 de Jode, op. cit..

19 Fernández-Giménez, M. E.; Baival, B.; and Wang, X. (Eds.). (2012). Restoring community connections to the land: Building resilience through community-based rangeland management in China and Mongolia; CABI: Wallingford, UK..

20 Herrera, P. M.; Davies, J.; Manzano Baena, P., eds. (2014) The Governance of rangelands: Collective action for sustainable pastoralism. Routledge, London. Available at: [http://cmsdata.iucn.org/downloads/governance\\_book.pdf](http://cmsdata.iucn.org/downloads/governance_book.pdf)

21 IUCN (2011). The land we graze. A synthesis of case studies about how pastoralists' organizations defend their land rights. IUCN ESARO office, Nairobi, Kenya. Available at: [http://cmsdata.iucn.org/downloads/land\\_rights\\_publication\\_english\\_web.pdf](http://cmsdata.iucn.org/downloads/land_rights_publication_english_web.pdf)



Pastoralism plays a major role in conserving land, soils, water and biodiversity by sustaining ecosystem function in the landscapes where it is practised. Combined, these landscapes may add up to more than half of the world's continental lands if we include rangelands, forests providing fodder resources, tundras, etc. Pastoralism can also showcase a production model which is socially, economically, culturally and environmentally sustainable.

**Carbon sequestration provides just one example of how pastoralism can support the green economy. Grazing lands cover five billion hectares worldwide and sequester between 200-500 kg of carbon per hectare per year, playing a leading role in climate change mitigation. Up to 70 per cent of dryland soil carbon can be lost through conversion to agricultural use. There is evidence that effective animal grazing by pastoralists promotes the biodiversity and biomass production needed to maintain these carbon stores. Improved grazing management could in fact sequester 409 million tonnes of CO<sub>2</sub>, or around 9.8 per cent of anthropogenic carbon emissions.<sup>22</sup>**

Studies in Europe, where a well-documented practice of pastoralism has existed for millennia and where the effects of pastoralism abandonment are increasingly becoming visible, show the importance of maintaining pastoralism. Through moderate grazing, pastoralism helps to prevent wildfires, at a cost that is much more competitive than the manned fire prevention squads, even if all subsidies covering pastoralist activities are included<sup>23</sup>, and are therefore a good complementary (not substitutive) control measure<sup>24</sup>. Moreover, pastoralism is able to sustain an increase of 20 per cent in biodiversity compared to abandoned landscapes or landscapes subjected to other traditional activities.<sup>25</sup> This demonstrates how important the role of livestock is in sustaining key ecosystem processes and functions.

A recent review of benefits of pastoralism on biodiversity and ecosystem function has been elaborated by the Livestock Environmental Assessment and Performance Partnership (LEAP) at FAO, with the participation of experts selected by pastoralist organizations.<sup>26</sup> The review evaluates the benefits of extensive livestock keeping and compares them with the issues associated with intensified/industrialized livestock keeping, such as high environmental pressures. The review further finds that a moderate livestock presence can contribute to nutrient cycling and the enrichment of soils with organic matter, thus contributing to soil health and carbon fixation; however, higher densities can cause a saturation of the system that leads to water pollution and land degradation. Similar effects are observed on biodiversity, where moderate disturbances caused by livestock can lead to the creation of ecological niches for further species; however, high disturbance levels are resulting in ecosystem collapse, loss of biodiversity and land degradation. Reliance on fossil fuel is negligible in extensive livestock systems, but very high in intensified/industrialized livestock keeping. A better engagement of pastoralists in policy dialogue can also support the use of clean energy resources, such as biogas, which are commonly

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