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# Revisiting the reciprocity of human-ecological systems: Integrating extensive agriculture and transhumant pastoralism in the Northern states of India

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## Abstract

India's primary sector is characterised by the age-old practices of agriculture and pastoralism that have traditionally remained symbiotic in nature. However, these relationships are dwindling in the light of uneven development focus and increasing climatic hazards. The current mode of local development practices is directly affecting the overall environment while simultaneously increasing the vulnerability of the resource-dependent communities. Pastoralism, along with the agricultural enterprise that is expanding with the support of irrigation network, is recognised as a major community-based occupation in the northern region of India. Despite that, pastoralism remains highly neglected in policy circles, whereas agriculture persists to be the dominant livelihood source both in popular imagination as well as development planning. In such a scenario, the contributions of pastoralism to rural livelihoods remain undervalued and scantily discussed in the context of the Indian subcontinent.

Highlighting the emerging need for sustainable management of natural resources amidst pressing climate crisis, in the current paper we recentre our focus on significance of pastoralism in the region. We emphasize on the integration of crop-livestock production systems based on the traditional reciprocities observed among the transhumant pastoral and settled agricultural communities in the North Indian states. While reviewing the interdependence and practices of exchange between these communities, we conceptualise the complex human-ecological requirements that serve as a basis for such long lasting associations. It majorly includes the exchange of resources, knowledge, market and labour along with persevering sociocultural linkages. Based on such thematic understanding, we essentially aim at highlighting the need for a revival of integrated peasant-pastoral production system that carry an untapped potential for managing the emerging socio-ecological challenges by promoting sustainable sharing of resources between the two co-dependent communities.

## Introduction

India has a rich history of pastoralism, but it remains under-represented in the public domain compared to the livelihoods that are co-dependent on it and have co-evolved simultaneously. Pastoralism in all its forms (nomadic, transhumant, agro-pastoralism) remains an age-old livelihood strategy that did not receive the due attention and acknowledgement it deserves for its socio-ecological contributions (Mukherji et al., 2016; V. P. Sharma et al., 2003). As a production system, pastoralism remains highly entangled with the agricultural sector and gets impacted by the changes that the cultivation processes undergo. The functional proximity and reciprocity embedded in the resource dependence make these two systems co-produce each other. This results in a behaviour that is compatible on the one hand and conflicting on the other. Compatibility manifests in terms of exchange of products and services obtained from discrete production processes and networks of social relationships. Whereas, conflicts are results of shared ecology, including landscapes for grazing and other natural resources. Many studies (Agrawal, 1991, 1993, 1994; Agrawal & Saberwal, 2004; Bhasin, 2013; Bhattacharya, 2019a, 2019b; Deb, 2015; Kavoori, 2005; Köhler-Rollefson, 1994; Saberwal, 1996; V. P. Sharma et al., 2003) document these complex relationships between farmers and pastoralists in India and provide the details on how reciprocity and conflict have remained a part of farmer-pastoral interactions since times immemorial.

Over the last few decades, with the phenomenal agricultural expansion, the reciprocal nature of these relationships has seen gradual and qualitative deterioration (Agrawal & Saberwal, 2004; Kavoori, 2005; A. Sharma, 2011). Conflicts are on the rise, while compatibility seems to be on a slippery slope. Many factors promote this shift, but the lopsided development in the agricultural sector remains a significant one. It has contributed to the marginalisation of the pastoralist communities by strengthening the existing exclusion policies that have continued since colonial times (Bhattacharya, 2019b; Chakravarty-Kaul, 1998). Thus,

resulting in declining reciprocity between agriculture and pastoralism that simultaneously increases the vulnerability of pastoral livelihoods.

Interestingly, different studies worldwide are providing promising evidence of pastoralism being an ecologically and economically viable occupation in times of emerging climate crisis. These studies represent the emergence of an international sentiment towards pastoralism's revitalisation (Bayer & Waters-Bayer, 1989; UNEP & IUCN, 2015). They also call for promoting climate-friendly and integrated farming practices where a combination of crop-livestock production with minimal external inputs can be achieved (Breu et al., 2015; Deb, 2015). Considering such a dynamic shift at the international level, planned integration and revival of reciprocities between the existing migratory pastoralism and extensive agricultural practices in the Himalayan region need to be revisited. This could lead to sustainable outcomes and efficient land-use practices by both the communities in the long run. However, this process cannot be done in isolation and requires a holistic policy approach that considers the co-dependence and complementarity of these production systems in both human and ecological terms. Considering this potential opportunity, in this paper we assess the traditional relationships between migratory pastoralism and agricultural practices within India's northern states to understand the prospects of achieving the much-needed integration and revival of reciprocity between the peasant-pastoral communities.

## **Methods and Study Site**

This paper is an outcome of a thematic analysis of the available literature that traces the co-evolution of agriculture and pastoral practices in the northern states of India. In this paper, we snowball the relevant literature focusing majorly on the pastoral communities in the states of Himachal Pradesh, Uttarakhand, Rajasthan, Haryana, Punjab, Uttar Pradesh and Union territories of Jammu and Kashmir and Ladakh. In addition, an on-going ethnographic study among the Gaddi pastoral community, from the north Indian Himalayan state of Himachal Pradesh also contributes important insights to this paper. Various examples of traditional arrangements of symbiotic reciprocity between the pastoral and agricultural communities are arranged thematically to fill the knowledge gap identified earlier and provide a theoretical input that further strengthens the demand for a revision in the development policy meant for these sections of the society. The revival of the reciprocity through farmer-pastoral co-dependency seems to hold the potential to manage the threats that loom large over the marginalised livelihood practices such as the migratory pastoralism.

## **Symbiotic Reciprocities and other interactions**

Many agricultural and pastoral communities (in states of Jammu and Kashmir, Ladakh, Himachal Pradesh, Haryana, Punjab, Rajasthan, Uttarakhand, and Uttar Pradesh) have remained in close alliance with each other for generations across these state boundaries. Traditional pastoral communities including Bakarwals, Gujjars, Gaddis, Bhotias, Raikas and Rebaris who rear a variety of livestock and follow nomadic or transhumant migration patterns interact with the settled farming communities on their migratory routes annually. Various studies provide the details of these relationships based on resource sharing pattern, seasonal market avenues, labour exchange and social and symbiotic reciprocity (Agrawal, 1993; Bhasin, 2013; Gooch, 2009; Kavoori, 2005; Köhler-Rollefson, 1994; Mukherji et al., 2016; Nautiyal et al., 2003; Nusrat, 2011; Rao, 2002; Saberwal, 1996). These studies also highlight the transitioning peasant-pastoral relationships that remain highly integral for achieving the much-needed sustainable outcomes in the face of increasing climate uncertainties. In-depth and contextual understanding of all these distinct yet overlapping domains of reciprocity presented below provides for a strong argument to revisit the farmer-pastoral relationships in order to achieve the sustainable production systems and for promoting an ecological equilibrium. This is done for the purpose of providing a knowledge base to policymakers and practitioners for later use.

### ***1) Resource-based reciprocity***

The land is the primary resource for both agriculture and pastoralism for maintaining their production system. Traditionally, these communities enjoyed a certain sense of mutual understanding and co-dependence where productive resources were shared and regulated according to the seasonal needs. Farmers welcomed migratory pastoralists and their herds to obtain the nutrient-rich manure for their fields. In return, pastoralists secured the forage for their livestock in the form of agricultural residue. Farm-pastoral exchange took place through the crop cycles and the fallow periods between harvests, as they suited the pastoralists' migration cycle. For instance, Raikas from the western tracts of Rajasthan moves up with their livestock in summer months to Uttar Pradesh to obtain the forage from newly harvested winter crops (Agrawal, 1992; P. Sharma & Sharma, 2015). Likewise, Himalayan transhumant pastoralists, including Gaddis and Gujjars, move with their livestock to the

lower plains in winter months when the higher pastures remain covered in snow (Bhasin, 2013; Gooch, 1992). The agricultural cycles in these terrains continuously provided the opportunity for reproducing this reciprocity, while aiding the pastoral mobility and access to grazing land and other productive resources. Livestock manure also offered a valuable organic resource that ensured soil fertility for a long time and provided a better yield of crops to the farmers in the plains (Agrawal, 1992; Agrawal & Saberwal, 2004). In exchange for livestock manure, pastoralists also used to receive cash payments from the agriculturalists, which has drastically reduced over time (P. Sharma & Sharma, 2015). Many factors including the introduction of irrigation technology, usage of inorganic chemical fertilisers, changed crop cycles and use of GMO seeds, burning of stubble, fencing of agricultural fields, fruit tree plantations as well as the increasing governmental support for intensifying commercial agriculture have been found to impact the dwindling reciprocity between the two communities severely. Expanding agricultural enterprise in the region has overtaken even the wastelands and other marginal resources available for the pastoralists, affecting the traditional resource sharing mechanisms between the communities (Source: Primary data collected by authors on the Gaddi pastoralists in 2019).

## 2) *Knowledge-based reciprocity*

Agriculture and pastoral practices require different sets of knowledge for managing their resources and production through different means. Although, animal husbandry has mostly remained a part of farming practices in north India, by virtue of their occupation pastoralists acquired expertise in understanding the animal behaviour, care practices, reproduction patterns and feeding needs etc. Similarly, agriculturalists remain proficient in cultivation related and land use related knowledge. Farmer-pastoral interactions in the traditional resource sharing arrangements helped both exchange crucial information on each other's production systems. This reciprocity was integral for enhancing productivity in both agricultural and livestock systems and was a valuable addition to their socio-ecological relationship and resource-sharing arrangements. In addition, the ecological knowledge that the pastoralists gather through their peripatetic experiences, whether in terms of biodiversity, health care practices and expert knowledge on climatic conditions provided for valuable exchange with the farmer community. Farmer pastoral reciprocity thus served as an opportunity to understand the variability and transitions occurring across these production systems and exchange specialised and experiential knowledge.

## 3) *Market and labour-based reciprocity*

Seasonal farmer-pastoral interactions also open the ways for exchange of products and labour across the two systems. Traditionally, pastoralists provide manure for the fallow fields and their labour to the agriculturalists for harvesting the standing crop. In such a manner, an increase in farm labour substantially helped the farmers on the one hand, and on the other, it provided pastoralists with the much-needed extra income or grains required for their consumption. Many settled agriculturalists even entrusted the pastoralists with their livestock for short term migrations. Pastoralists then would migrate with the extended herds that earned them monetary gains apart from direct exchanges. Other pastoral products, including wool, milk and dairy items, also found the marketing avenues in these interactions. This material exchange held cultural and ecological value for both the communities, as the articles that are exchanged were specialised products that can only be found or produced in limited quantity and in challenging ecological conditions.

## 4) *Socio-cultural reciprocity*

Farmer-pastoral interactions are not merely economic or ecological in nature but also are found to encompass many other socio-cultural dimensions. For instance, folding the animals on influential agriculturalist's fields provided a sense of security to the Raika pastoral herds by keeping away local miscreants and preventing thefts on migration routes (Agrawal, 1992). The web of social networks developed across the communities through their symbiotic reciprocity, resulted in building rich social capital and relations that often turned into fictitious kinships in practice. Bhasin (2013) in her paper on pastoralists of Himalayas, mention about the "*Dharam-bhais* or pledge brothers" among the Gaddis of Himachal Pradesh. Such pseudo-kinship bonds developed out of these reciprocal associations went far beyond the economic exchanges that happened in functional terms.

## **Discussion**

Despite being an age-old practice, pastoralism in the North Indian region has mostly remained out of the immediate focus of agrarian development models (Kavoori, 2005) undertaken by the state. As a result, the pastoral practices and their relationship with the agricultural production systems have not received the due attention they deserve. In sections mentioned above and the themes identified from our systematic literature

review, we highlight the areas of reciprocity between the agricultural and migratory pastoral systems across the north Indian terrain. This reciprocity that existed for ages has demonstrated closed production cycles (Breu et al., 2015) characterised by minimum wastage and minimum external inputs. However, over the past few years, these traditional relationships have weakened in the face of drastic change in the pattern of agricultural production and the prevailing development interventions that marginalise pastoralism as a lifestyle and occupation in more than one way. Decreasing dependency of farmers on pastoralists has increased the difficulties of the latter by pushing them further to the margins and increasing their livelihood vulnerability more than ever. As a result, pastoral practices as well as the socio-ecological equilibrium they contribute to, are dwindling.

Disruption in reciprocity processes between the regional pastoral and agricultural systems has affected the pastoralists directly and has left a latent impact on farming practices that are gradually turning unsustainable and resource intense. Many scientific studies across the geography have established the significance of migratory pastoralism in maintaining food security and biodiversity, in providing consumer goods and livelihoods by merely exploiting the marginal environments and agricultural residues (Bhasin, 2013; Breu et al., 2015; P. Sharma & Sharma, 2015). In such a scenario, when the dire consequences of Anthropocene are frequently being felt through the fast-emerging climate crises, reviving the traditional practices of reciprocity, and promoting resource sharing instead of segregation, and enhancing co-operation instead of isolation are much required. A renewed stress on reviving the moral economy through appropriate policy interventions that consider holistic development approaches, multiple stakeholder engagements, diverse livelihoods and a dynamic feedback system, is needed to reinstate traditional practices and reciprocities.

As discussed throughout the paper, both agricultural and pastoral practices remain integral not only for several communities' livelihoods but also for pursuing ecologically sound practices in the region. The available documentation on the seasonal resource dependence established over generations of reciprocity by the two distinct communities shows its significance for achieving the ecologically sustainable production systems in the region. The knowledge generated through this review also gives us a hope that it is possible to rekindle the weakening symbiotic reciprocity by introducing appropriate policies and processes highlighting the sustainable resource sharing mechanisms between these communities of practice.

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