

Enhancing the economic viability of pastoralism: the need to balance interventions

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Summary

Extensive mobile pastoral systems do not follow conventional marketing optimisation models, since they must deal with the factors of mobility, erratic environments, dependency on natural resources, seasonality, and distance to markets. While pastoralist systems contribute substantially to national economies, government investment to support pastoralism remains limited or non-existent. Pastoralists are becoming increasingly integrated into larger market systems and therefore need investment and specially adapted policies to supply a growing demand for livestock products and to support their livelihoods.

In this paper, the authors show that investment and technology can support and empower pastoralist marketing strategies in supplying higher-value and more stable livestock products. Furthermore, the authors demonstrate that pastoralists also supply services, broadening the marketing landscape within which they operate to include more players and trading options. Pastoralists are undeniably the custodians of rangelands and provide a wide range of ecosystem services. These new market prospects nevertheless require structuring (e.g. regulation, infrastructure) and adjustments in the trading environment of stakeholders all along the value chain.

There is, however, an inherent risk in intervening in pastoral marketing and production processes. Too many or ill-adapted interventions can have severe effects on these systems, resulting in over-intensification and reduced mobility. Finding the right level of intervention to support extensive pastoral systems is important when developing policy, since it is about the only form of land use that can keep a third of the world's land surface in food production without additional inputs.

Keywords

Food systems – Information and communication technology – Livestock products value chain – Markets – Pastoral system economies – Pastoralism – Payment schemes – Scarce natural resources.

Introduction

Extensive mobile pastoral systems operate in marginal lands, with remoteness, uncertainty, and dependency on natural resources as the three main characteristics that affect marketing strategies. Pastoralists in extensive mobile pastoral systems produce and market their livestock products in a number of ways, according to the local environment, their

needs and their opportunities, thus explaining variations in marketing strategies and value-chain models within countries and across regions. Pastoralists take advantage of scarce and patchy resources by moving their herds (1), especially in drylands and alpine environments, where most pastoral systems are found. Mobility takes place over short or long distances, with pastoralists moving constantly or seasonally, and may also take the form of seasonal lowland–upland transhumance in mountains.

Livestock products in these systems supply needs for individual families, their relatives, and nearby populations. They are also sold and processed through a number of participants in value chains to reach wider markets, such as retailers in urban centres, and may be exported to foreign countries (2). Pastoralists walk their animals to local livestock markets, or may trade their products (live animals, meat, milk and dairy products, wool, hides) through 'middle men' or intermediaries, who collect the animals from pasture by truck, when this is possible. Markets are key places where pastoralists can acquire cash, run errands, arrange schooling for their children, meet people, purchase goods, seek medical and veterinary care, and acquire information.

This paper reviews the challenges of marketing pastoral products in Africa and Asia by exploring hindrances and the strategies adopted by herders to overcome them, along with existing solutions to improve and stabilise marketing conditions by producing higher added-value and branded products. It also examines opportunities beyond the sale of livestock products, such as payment for ecosystem services. The paper concludes by presenting a number of approaches to improve pastoralists' bargaining power and to maintain a quality supply of livestock products to consumers, as the demand for livestock products is forecast to grow around the world (3).

Value of pastoralism

Pastoralism as a viable livelihood

Assessing the economic viability of pastoralism is complex, because although owning animals can be a source of wealth, there are numerous variables that affect the marketing of those animals, e.g. assets (land, social capital, institutional strength), access to assets (markets, water, pastures, health services), and vulnerability (climate shock, disease, conflict) (4, 5). A diversification of income from crop production and remittances is increasingly contributing to pastoralists' total livelihoods, often even surpassing the share from livestock production (6).

The marketing rationale of pastoralists is unconventional and often does not follow optimisation models, according to markets' demand-side needs (1, 2). This occurs first because pastoralists prefer to hold animals instead of cash (7). Secondly, when they do need cash and sell their livestock, animals are not necessarily in the best condition for marketing (8). Thirdly, pastoralists operate in a highly uncertain environment and thus are unable to supply markets with a consistent volume and stable quality of livestock products (7). This is mostly due to distance and dependency on natural resources, whose availability varies

from year to year. Livestock in these pastoral systems receive less veterinary support than elsewhere and animals are thus more exposed to disease outbreaks. Infected herds are banned from moving to prevent them from infecting wildlife and animals reared in sedentary systems (7).

Pastoralists invest in social capital to ensure that uncertainty, and thus livestock collapse, is compensated for by reciprocity within their community and networks (9, 10). For example, in the last Mongolian *dzud* (extreme winter) in 2010, broad networks were vital for pastoralists to secure access to pastures outside the *dzud*-affected areas. Herders who moved herds to better pastures over long distances (over 300 km) at the onset of the *dzud* were better off after the crisis (authors' own data, collected in Dundgovi), and recovered from it faster, than those who did not move. Moving herds over long distances to escape a *dzud* nonetheless requires sufficient financial means and an adequate network to respond fast. Other herders without such a network or the financial means to respond to climate shocks fall into chronic poverty or experience hardship for a short period before exiting poverty and reconstructing their wealth a few years later. As a result of these diverse strategies to respond to climate hazards and the differing levels of financial capacity, pastoralists have diverse, highly varying economic and livelihood trajectories, reflected in substantial inequality in wealth among herders.

Social capital enhancement and income diversification are therefore the areas with the highest potential for improving pastoral livelihoods and reducing inequality. The potential option of improving pastoral productivity in an already resource-scarce environment seems limited (11). Improving the value chain is another area that can positively affect pastoralist livelihoods. However, changes in production methods (mechanisation, centralisation) and diversification of income (crop encroachment onto pastures) profoundly transform social structures, the division of labour and herd composition. Such transformations, for instance, excluded women from their traditional role in the value chain of milk producing and marketing in West Africa. As shown below, they can also reduce mobility when pastoralists need to settle closer to processing plants (12).

Pastoralism in national economies and the need for government recognition

Pastoralism is a source of income for about 50% of the active population in West Africa and contributes over 44% to the agricultural sector's gross domestic product in Mali, 28% to that of Namibia, and up to 80% in Sudan (7). In Mongolia, mobile herders contribute more than 20% to the national economy (13), a figure that is likely to increase, since the mining sector has not delivered the expected national revenues due to decreasing mineral prices in 2014. The landless mobile Ajar and Gujar pastoralists in the

Hindu Kush and Himalaya mountains of northern Pakistan contribute over US \$64 million to the economy of the Khyber Pakhtunkhwa province (14). The limited investment in improved infrastructure for pastoralism by governments does not reflect the substantial contribution of pastoral systems to local economies. A general negative perception of pastoralism, along with the fact that pastoralism functions at the margin of conventional agricultural systems, are potential reasons explaining this lack of investment. In some cases, pastoral communities have simply been ignored by governments (14). This situation is nevertheless changing, with a gradual recognition of pastoral systems' contributions and the implementation of institutional and economic measures, as shown below.

Providing the means for pastoralists to be adequately compensated for the products they market is a crucial element of their livelihood and their capacity for resilience, and thus can prevent marginalisation and land degradation resulting from an environment–poverty nexus. If governments and societies adequately valued livestock production, the benefits would be shared amongst all participants along the value chain (7).

Challenges for pastoralists

Effect of distance to markets and climate variability on management, production and marketing strategies

Distance to markets affects decisions about what to produce (dairy products or live animals and meat), which subsequently determines herd composition and management choices, such as whether or not to invest in winter fodder (15). Kyrgyz pastoralists who are closer to larger urban centres try to maintain a constant supply of products to satisfy consumer needs. A far larger proportion of herders close to the capital city of Bishkek (32%) depend on sales of dairy products, while only 2% of herders living in the countryside or closer to secondary towns depend on dairy sales (15). As a result, herders closer to Bishkek invest in costly feed inputs to maintain steady milk production from cattle. Herders further away from the capital opt for a strategy of marketing meat or live products, and hence rear more sheep, and tend to balance their winter strategy between pasturing and feeding livestock. Without being able to predict the severity of winter, meat-producing herders can either stock up with feed at a high cost to support their livestock through lean winter periods, or decide not to invest in winter fodder but run the risk of losing animals if the winter turns out to be worse than expected. If they do purchase winter fodder, they take the risk of losing their investment if the winter is milder than expected. On the whole, herders further away from markets

invest less, while herders closer to markets are willing to accept the risk of higher losses by investing more, because, in general, a higher income can be secured when supplying markets with high added-value products.

In Mongolia, herders closer to the Chinese border take advantage of the ban on goats in Inner Mongolia and a growing demand for cashmere wool. Mongolian herders favour goats in their herd composition and have developed networks across the border to sell their wool at higher prices than on the national market. By doing so, they skip a number of intermediaries and, while in China to trade their wool, they purchase goods more cheaply than in Mongolia and resell them across the border, which adds to their profit.

Pastoralists further away from markets bear the brunt of distance at a cost. The Ajar and Gujar pastoralists in the northern Pakistan mountains endure long treks to central district markets. As a result, the animals they market are in poor condition. Furthermore, herders must sell their animals at any price, however low, because they cannot afford to trek the unsold animals back home. This problem could be overcome if markets provided the services pastoralists needed; with better market infrastructure, such as shade, sheds, water, and fodder, livestock could be given the chance to recover from the trek and pastoralists would be able to negotiate higher prices for fitter animals. Markets often do not provide these services to pastoralists even though the latter pay an entrance tax. This tax could be used to finance the necessary infrastructure, but it usually serves general urban municipal utilities rather than supporting livestock market facilities (16).

Pastoralists adopt various off-take and marketing strategies driven by seasonality. In Central Asia, festivities such as weddings are often arranged in autumn, as a de-stocking opportunity before winter, allowing for a reduction in high livestock maintenance costs during winter (15). In Central and Inner Asia, more meat is consumed in winter since pastoralists can preserve slaughtered animal meat outside where it stays frozen. Winter is also a critical period, since heavy snowfalls can impede mobility to better pastures and markets and the purchase of winter fodder (17). In summer, pastoralists tend to produce and consume milk products, such as curds and dried yogurt, since more milking animals are available. Fermented mares' milk is also produced during summer and sold at local markets (18).

Pastoralists targeting sales in the Muslim world prefer to sell during festivals when livestock prices peak (8). However, the Islamic calendar is lunar, so these festivals sometimes fall at times when herders may find it difficult to market their animals.

In most regions, pastoralists balance their production and marketing needs by splitting their herd, keeping

milking animals in a shed and letting their other animals graze on pastures. This practice facilitates milk collection, transportation and marketing (7).

Institutional innovations and opportunities for investment

Information, communication and technology

Information, communication and technology (ICT), through mobile phones, the Internet, radio, and other media, has become a vital work tool for pastoralists in recent years (7). ICT provides pastoralists with the means to acquire relevant market information, particularly prices, in order to make trading decisions. They negotiate prices with several intermediaries on the phone before closing a deal. ICT fosters a competitive environment among intermediaries, creating fairer trading conditions for pastoralists by forcing those with whom they deal to provide better service and remain trustworthy. ICT, coupled with better facilities on market sites, as described above, could greatly increase the bargaining power of pastoralists.

Mobile phones are also used to seek information on pasture conditions and to plan mobility. Several countries have implemented early warning systems through mobile phone group texting to disseminate information on extreme weather forecasts, allowing pastoralists to better prepare and reduce livestock losses. Mobile phones are also used by herders to complete financial transactions. Pastoralists use various methods to obtain a mobile phone signal in remote areas: climbing hills for elevation, getting closer to a transmitting antenna in a district centre, using an antenna booster, or using a phone connected to a radio-based telecommunications system, which also provides Internet access (wireless local loop). Information broadcasts on community radio (e.g. regarding market prices) in Kenya and Niger have also proven to be an important tool, empowering pastoralists and increasing livestock product prices as a whole (7).

Institutional and financial mechanisms to stabilise pastoral markets

As mentioned above, the marginalisation of pastoralists, coupled with the fact that their products are not fully integrated into national food systems, is one of the reasons why their economic contribution is going unnoticed. For this reason, extensive mobile pastoral systems lack public and private investment to further their trade potential. Solutions to enhance and ease pastoralist access to markets consist mainly of providing structure (e.g. regulation, policy implementation, infrastructure) and financial support,

while stabilising the supply side. Measures such as building abattoirs and milk-processing plants closer to pastures, developing producer cooperatives, and organising pasture-user groups have been successfully implemented.

Investment

While the unstable supply of livestock products makes pastoralism unattractive to investors, an initiative in northern Senegal has proved that some level of compromise can be found. The growing demand for dairy products in Senegal, supplied mainly by imported products, motivated the creation of the *Laiterie du Berger*, or Shepherd's Dairy, a milk-processing company established in the Peuhl pasturing region. The *Laiterie du Berger* was initiated by a consortium of investors involving the French dairy company Danone and the Grameen Bank (the founder of micro-credit programmes in Bangladesh). Sales increased from US \$0.43 million in 2007 to US \$3.83 million in 2013 (19). Supply can be stabilised by providing an incentive to pastoralists through higher income, allowing them to move less and adopt higher sanitary and animal health standards.

Commodity-based trade

Disease control policy, however, can be a limiting factor for pastoralists who want to access wider markets and export their products, but there are alternative ways to comply with sanitary and animal health standards (20, 21). Commodity-based trade is one such approach, focusing on the product itself rather than the disease status at the source (22). Commodity-based trade, for example, authorises deboned, processed meat from healthy animals for export, even when it originates in areas still affected by foot and mouth disease. Commodity-based trade mechanisms give producers the opportunity to access international markets by minimising the risks of contamination (22). Perry and Grace (21) highlight the fact that livestock disease controls may help market penetration and therefore potentially contribute to reducing poverty, although the authors also temper this conclusion. Measures that are inherently highly politicised, such as commodity-based trade, can give rise to major barriers to supporting pastoralists to exit poverty (21).

Cooperative abattoirs

Information circulating between abattoirs and pastoralists has been crucial in maintaining a high-quality meat supply from pastoralists in Botswana. Botswanan abattoirs, along with Veterinary Services, inform pastoralists on the required quality standards for meat export. Abattoirs keep pastoralists informed through radio broadcasts and stakeholder meetings. Such initiatives have enabled Botswanan pastoralists to compete with international meat producers with high-quality products (7). A similar model

was implemented in Kenya, where Turkana pastoralists organised a cooperative abattoir. The success of this model relies on the direct engagement of pastoralists in the abattoir business. As in the Botswana case, the cooperative Turkana abattoir keeps pastoralists informed on market prices and needs by organising village meetings (7). However, seeking export markets through adhering to international standards and intensifying livestock production is not always a panacea as it often requires a reduction in mobility, thus increasing vulnerability to drought (23).

Intensification of livestock breeding

The intensification of livestock production for exports has a number of breeding trade-offs. Crossing exotic, high-input, high-output breeds with indigenous ones may increase production, while keeping some of the adaptive traits needed in rangeland where resources are scattered, but it comes at the cost of diluting indigenous genetic resources. The adaptive traits of indigenous breeds – for instance, low maintenance, disease resistance, and the ability to access rugged terrain – are so valuable that we should question the rationale of crossing these animals with imported, high-input, high-output breeds, especially when the costly maintenance requirements of the latter are taken into consideration. Cross-bred animals are often more susceptible to disease and have reduced draught power and lower fertility rates when compared to indigenous breeds (24).

Micro-finance

Various forms of micro-finance initiatives across Africa offer loans at affordable interest rates to pastoralists. These are specifically tailored for pastoralists who do not have access to conventional bank credit, due to their highly uncertain income. Micro-finance programmes anticipate these risks by providing loans to groups of herders, which secures repayment (7). Micro-finance, however, does not always succeed in empowering underprivileged communities and is not the only instrument available (25). Savings, cash transfer, and insurance can also provide essential support to pastoralists (7, 26).

Insurance

Insurance has become an important method of compensating pastoralists for losses, enabling them to recover from livestock collapse more swiftly and enhancing their trading power. Insurance schemes in areas with highly variable weather have recently begun to offer index-based livestock insurance (IBLI) cover, which compensates policy-holders on the basis of drought indices, such as levels of vegetation cover measured by satellite imagery (26). Unlike conventional insurance, IBLI holders are compensated according to these indices and not according to actual losses. Such schemes are non-discriminatory

when compared to conventional insurance schemes, since pastoralists who decide to maintain their herd by purchasing fodder or becoming more mobile to reduce their losses are compensated at the same level as those who decide not to do so. Under conventional schemes, pastoralists had no incentive to maintain their herds because compensation reflected livestock losses. IBLI has had substantial participation rates among pastoralists in Kenya and in the Borana region of Ethiopia, with positive impacts, e.g. banks are more inclined to extend loans to herders with IBLI policies (27, 28, 29). In Mongolia, where losses are borne in summer and winter, IBLI covers losses when mortality reaches 6%, while the government covers losses above 30% (30). The scheme was implemented across the country in 2012, based on pilot projects, but so far few herders have purchased the insurance policy (31). Most herders were not aware of the scheme during the 2010 *dzud* (extreme winter event), and today they prefer to wait and see how compensation will be organised during the next *dzud*.

Payment for ecosystem services

Pastoralists perform multiple roles in the management of rangelands and landscapes and can rightly be considered the custodians of natural capital in these areas. Increasingly, their role in managing rangelands is seen as supplying ecosystem services (23). In Israel and the south of Spain, pastoralists receive payment for maintaining their animals in dryland forests as a means of fire control (8, 23). Pastoralism multi-functionality is also integrated in Swiss and French alpine pastures, where grazing contributes to landscaping, higher-quality products, and branded cheese production, as well as preventing avalanches.

Dougill *et al.* (32) and Stringer *et al.* (33) show that community-based institutional arrangements among pastoralists can achieve higher storage of carbon in dryland regions. Managing rangelands for carbon is crucial because they store up to 30% of the world's soil carbon (34). This carbon store is nevertheless highly sensitive to land use change so specially adapted schemes for improved grazing practices can support pastoralists to maintain sustainable forms of land use. In addition, higher levels of carbon in the soil retain moisture and increase land productivity. Therefore, sequestering carbon in rangelands can contribute to both mitigation of and adaptation to climate change. However, the price of carbon is currently too low to provide herders with additional income in the short term.

A number of successful schemes and certification systems in Africa and South America reward herders who reduce pressure on wildlife by giving them access to markets that pay more for livestock reared under a wildlife-friendly management system (23). Such ecosystem services supplied by pastoral systems create niche markets which are likely to grow (23).

Conclusion

There are two approaches to the future of pastoralism espoused among researchers and practitioners. The first supports the idea that pastoralists have been doing well for thousands of years in managing their land systems and do not need external interventions to thrive. Past experiences of state interventions have shown a tendency to settle pastoralists and to attempt to 'modernise' their lifestyle and practices (35), which, in return, has potentially reduced the benefits from traditionally well-managed pastoral systems. The other view supports the idea that, with globalisation, new societal needs, and transformations in governance models, extensive mobile pastoral systems may increasingly struggle. In theory, this approach would require more intervention and intensification.

In this analysis, the authors show that the future of pastoralism is likely to adopt a mixed form, drawing from both views, with new high-quality niche markets and branded products from pastoral systems tailored to a growing demand from consumers. The quality of livestock products and pastoral ecosystem services also greatly depends on preserving traditional pastoral methods while attracting investors from the private and public sector but

minimising impacts on pastoral systems management. Flexibility and adaptation are inherent to pastoral systems. Therefore, the transition to new market models, adopting innovation and new technologies, is a normal process in a system that is constantly adapting to change.

There is no single pathway for the future of pastoralism across the world, given regional variability at the environmental, institutional and economic level. Nonetheless, pastoralism is increasingly being acknowledged as a means of food production and management for 30% of the world's land surface. This transformation is increasingly influencing global and national governance towards better integration of pastoralism into food systems and national environmental policies.

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Renforcer la viabilité économique du pastoralisme : l'impératif d'interventions équilibrées

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Résumé

Les systèmes pastoraux nomades extensifs ne suivent pas les modèles classiques d'optimisation commerciale, dans la mesure où ils doivent faire face à des facteurs liés à la mobilité, aux fluctuations environnementales, à la dépendance à l'égard des ressources naturelles, à la saisonnalité et à l'éloignement des marchés. Malgré l'importance de la contribution des systèmes pastoraux aux économies nationales, les investissements consentis par les gouvernements pour soutenir le pastoralisme demeurent limités, voire inexistantes. Les pasteurs s'intègrent de plus en plus dans des marchés plus vastes, ce qui nécessite des investissements et des politiques spécifiques afin de satisfaire la demande croissante en produits d'origine animale et de soutenir les sources de revenus pastoraux.

Les auteurs de cet article montrent que les stratégies commerciales des pasteurs visant à proposer des produits d'origine animale mieux valorisés et plus stables peuvent être soutenues et rendues plus autonomes au moyen d'investissements et d'apports technologiques adaptés. En outre, les auteurs démontrent que les pasteurs sont également des prestataires de services, ce qui accroît la portée économique de leurs activités en intégrant davantage d'acteurs et d'ouvertures commerciales. Les pasteurs sont indéniablement les gardiens des prairies et fournissent d'importants services écosystémiques. Néanmoins, ces nouvelles perspectives commerciales exigent à la fois un cadre structuré (en termes

notamment de réglementation et d'infrastructures) et certains ajustements du contexte commercial dans lequel opèrent les parties prenantes tout au long des chaînes de valeur.

Toutefois, il y a un risque intrinsèque à intervenir dans les processus de commercialisation et de production du pastoralisme. Des interventions trop nombreuses ou inadaptées peuvent avoir de graves conséquences sur ces systèmes, se traduisant par une intensification excessive et une limitation de la mobilité. Il est important de trouver le niveau approprié d'intervention au moment de concevoir des politiques de soutien aux systèmes pastoraux extensifs, car cette modalité d'utilisation des terres est pratiquement la seule à permettre qu'un tiers de la surface agricole de la planète soit consacré à la production alimentaire sans recourir à un surplus d'intrants.

Mots-clés

Chaîne de valeur des produits de l'élevage – Dispositifs de paiement – Économie du système pastoral – Marchés – Pastoralisme – Ressources naturelles rares – Systèmes de production alimentaire – Technologies de l'information et de la communication.



Necesidad de equilibrar las intervenciones para mejorar la viabilidad económica del pastoreo

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Resumen

Los sistemas de pastoreo de carácter extensivo y nómada no se ajustan a los modelos convencionales de optimización de la comercialización, puesto que deben responder a factores como la movilidad, la variabilidad del medio, la dependencia de los recursos naturales, la estacionalidad o la distancia a los mercados. Pese a que los sistemas pastorales contribuyen sustancialmente a la economía de los países, la inversión pública en apoyo del pastoreo sigue siendo escasa o inexistente. Las sociedades pastorales, cada vez más integradas en sistemas de mercado de mayor tamaño, necesitan por ello mismo inversiones y políticas especialmente concebidas para satisfacer una demanda creciente de productos ganaderos y para respaldar sus medios de sustento.

Los autores explican que la inversión y la tecnología pueden potenciar las estrategias de comercialización de las sociedades pastorales y favorecer su autonomía al propiciar una oferta más estable de productos ganaderos de mayor valor. Además, los autores demuestran que las sociedades de pastores también prestan servicios, ampliando el paisaje comercial en el que operan para integrar en él a un mayor número de agentes y vías de comercialización. Resulta indudable que los pastores son los custodios de los pastizales y prestan muy diversos servicios ecosistémicos. Sin embargo, para hacer realidad estas nuevas perspectivas de mercado es preciso estructurar (por ejemplo con reglamentos e infraestructuras) y adaptar el entorno comercial en el que intervienen los distintos agentes dentro de las cadenas de valor.

Existe pese a todo un riesgo inherente a toda intervención en los procesos de comercialización y producción pastorales. Demasiadas intervenciones, o intervenciones inadaptadas, pueden perjudicar gravemente a estos sistemas y llevar a una excesiva intensificación y a una pérdida de movilidad. A la hora de formular políticas es importante dar con el nivel adecuado de intervención para respaldar a los sistemas pastorales extensivos, no en vano estos representan el único uso del suelo capaz de mantener la producción de alimentos en un tercio de la superficie terrestre del mundo sin ninguna aportación adicional.

Palabras clave

Cadena de valor de los productos ganaderos – Economía de los sistemas pastorales – Mercados – Pastoreo – Planes de pago – Recursos naturales escasos – Sistemas alimentarios – Tecnología de información y comunicación.



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