Policy Brief

Capitalizing on pastoralism to feed people and achieve livestock sector sustainability

SUMMARY

The *Global Agenda of Action towards sustainable livestock sector development*[1] (GAA) has embraced the concept of improving "natural resource use efficiency"[2] (NRUE) by means of new technologies to meet the world's growing demand for livestock products while also reducing the environmental costs of the sector. This policy brief proposes an alternative approach to increasing livestock sector output without adding to environmental externalities: enhanced and more efficient use of the biomass in arid and remote areas by means of strengthened and modernized pastoralist production systems. Such an approach would not only diminish the environmental costs, but also enhance countries' self-sufficiency and contribute to national poverty alleviation, sustainable rural development and reduce rural-urban migration. Here we collate arguments in favour of according pastoralism a more prominent role in achieving future food security and present recommendations for strengthening and modernizing such decentralised approaches to livestock production

The GAA: Increasing livestock production in the context of finite resources

The Global Agenda of Action towards a sustainable livestock sector (GAA) is a multi-stakeholder initiative initiated by the FAO, the World Bank and the International Livestock Research Institute (ILRI). It is based on two premises: (1) the demand for livestock products will continue to grow and is predicted to almost double by 2050, and (2) this growth will have to be achieved without harm to the environment and to the climate, while also contributing to society's social, economic and health objectives. To achieve the latter goal, the GAA proposes improved "natural resource use efficiency" (NRUE) – defined as the ratio between the amount of animal feed and other resources that are needed to produce a certain amount of a product, such as 1 kg of meat or 1 litre of milk.

Research and action is to focus on the following issues:

(1) "**Closing the efficiency gap".** Basically this means that the less efficient livestock systems are to catch up with the more efficient ones. This is to be achieved by applying already existing technologies and institutional frameworks to those systems that lag behind and thereby improve their resource use efficiency and generate economic and social gains.

[1] See www.livestockdialogue.org for further information on the background and rationale of the initiative.

[2] http://www.livestockdialogue.org/fileadmin/templates/res_livestock/docs/workshop/2012_02_April_Rome/Why_focus_on_NRUE.pdf

(2) "**Restoring value to grasslands".** This research and action theme will explore how to increase the potential of grasslands to act as carbon sinks. Its goal is to identify mechanisms, incentives and policies that can enhance this role of grasslands, while also supporting sustainable livelihoods.

(3) "**Towards zero discharge":** This focus area will investigate how the negative impacts of intensive and industrial livestock keeping, such as the accumulation of manure and emissions of greenhouse gases, can be alleviated. This is to be pursued by finding ways and means of recovering and recycling nutrients and energy contained in manure.

An initiative to address the sustainability of livestock production is urgent and welcome in view of the sector's enormous environmental impacts. However, there are concerns about the theory and concept of sustainability that is underlying the GAA. The adopted approach of "sustainable intensification" translates into increasing outputs through higher yields per animal and a better feed conversion rate. For example, the Agenda documents state that "*advanced genetics, feeding systems, and animal health protection have enabled industrialized countries, over the past four decades, to reduce their overall land requirements for livestock by 20%, while at the same time doubling total meat production*". This implicitly casts industrial systems as positive examples of resource use efficient livestock production that developing countries should emulate. Such an analysis ignores the their huge negative side-effects in terms of use of antibiotics and other pharmaceuticals, erosion of genetic diversity, animal welfare and loss of rural livelihoods that have accompanied the increased "natural resource use efficiency" of developed countries. All of these negative externalities are facing an increasing amount of opposition by the public and will not be acceptable in the long run.
On the other hand, in the context of the GAA, pastoralism is mainly seen as a means of increasing carbon sequestration in rangelands, and less as an option for enhancing food production and contributing to global food security. This policy brief collates arguments in favour of according pastoralism a more prominent role in achieving future food security and presents recommendations for strengthening and modernizing such decentralised approaches to livestock production. Such an "eco-extensification" approach would seek to expand the capturing of biomass which would otherwise remain unused. It thus differs conceptually and practically from "sustainable intensification"[3].

Principles and Advantages of Pastoralism

Pastoralists use both crop by-products as well as bio-diverse natural vegetation to raise livestock. The principle underlying pastoralism is to access scattered and seasonally available biomass in semi-arid, arid and other remote areas and "interstitial spaces"[4] by means of locally adapted, mobile livestock herds and metabolize it into highly valuable products. This food production strategy builds on locally adapted livestock breeds, elaborate technical knowledge and complex social institutions including reciprocal relationships to ensure optimal and long-term viable use of rangelands. As a complex livelihood and ecological system, pastoralism has the following advantages:

- **Amazingly efficient means of generating protein**. As evident from Table 1 below, countries with predominantly pastoral production systems have a very positive human-edible protein balance in contrast to those with high input industrial systems. The human-edible protein balance refers to the ratio between edible human protein that is fed to livestock and the amount of human edible protein that is generated by livestock. In Table 1 below, we can note

[3] Thornton, P. 2010. Livestock production: recent trends, future prospects**. Phil. Trans. R. Soc. B *365** (1554): 2853-2867.*
[4] Defined here as places with bio-mass that is "in-between" cultivated areas, such as fallow, road sides, along river beds, etc.

that countries with highly industrialized systems have a negative balance: for example in the case of Saudi-Arabia, less than one fifth of the protein that is fed into the system comes out of it. By contrast, in countries dominated by pastoralist production systems, such as Ethiopia, Mongolia, and Kenya, between 15 and 20 times more protein is generated than consumed by livestock.

Table 1: Human-Edible Protein Balance in selected countries (Source: FAO, 2011[5])

	EDIBLE PROTEIN OUTPUT/INPUT	**Balance (in tons)**	**Comment**
	AV.2005-2007	**AV.2005-2007**	
Saudi Arabia	0.19	-659 588	Protein destroying
USA	0.53	-7 650 830	Protein destroying
Germany	0.62	-1 183 290	Protein destroying
China	0.95	-665 276	Protein destroying
Mongolia	14.60	35 858	Protein creating
Ethiopia	16.95	141 395	Protein creating
Kenya	21.16	202 803	Protein creating

- **Utilizes arid and semi-arid areas not suitable for crop cultivation.** Pastoralism is a means of utilizing harsh environments not suitable for crop cultivation. It therefore does not compete with the production of food for human consumption.
- **Nutritional quality of products**. The nutritional quality of livestock products from bio-diverse grazing systems is very high. They contain a higher amount of certain fatty acids - essential in the human diet - than the products from concentrate fed animals[6].
- **Low carbon footprint.** Pastoralism is basically solar powered and largely independent of fossil fuels, as animals walk to their grazing areas and feed on unfertilized vegetation.
- **No need for tackling nutrient overload.** Pastoralism avoids accumulation of unwanted manure and thereby prevents the nutrient overload that is a characteristic side-effect of intensive production. It fertilizes rangelands and is much appreciated by many farmers as organic fertilizer, for instance in South India.
- **Conserves biological diversity**. Pastoralism is associated with a high degree of biodiversity, including domestic animal diversity as well as wild flora and fauna (FAO, 2010[7]). Most wildlife conservation parks are located in pastoralist areas.
- **Animal welfare friendly**. Pastoral herd management enables animals to live in (almost) natural social systems and without major interference to their natural behavioural patterns.
- **Low cost of production.** The cost of production in pastoralist systems is a fraction of those in intensive systems, as no money needs to be expended on purchase of inputs. Replacing low input systems with high-input systems will push poor livestock keepers out of their livelihoods and further undermine equity.
- **Sustains equitable rural development**. Banning pastoralism can lead to rural poverty and force people to migrate into cities where they join the urban unemployed or work under inhumane conditions. Countries that ignore or ban pastoralism experience rural poverty: in

[5]FAO. 2011. **World Livestock 2011. Livestock in food security**. Rome.

[6] Kalec, P. 2011. The effects of feeding fresh forage and silage on some nutritional attributes of beef: an overview. **Journal of Agrobiology 28** *(1)*, 1-13

[7] FAO. 2009. **Livestock keepers – guardians of biodiversity**. Animal Production and Health Paper. No. 167. Rome.

China the ban on pastoralism in Inner Mongolia has exacerbated poverty by making ex-pastoralists dependent on government hand-outs, while also leading to rangeland degradation[8].

- **Pre-adapted to climate change**. Pastoralism is the classic approach to using unstable and unpredictable environments for food production and due to its very nature can be expected to comfortably be able to cope with climate change[9]. As a biodiversity based production system it will be less vulnerable to climate shocks than intensive livestock systems based on mono-cropping systems.
- **Output higher than reported.** Official statistics do not capture all the economic values associated with pastoralism. Provision of milk and meat for household and local use does not enter the statistics. Even direct values captured by markets like animal, milk sales and hides production are often not well recorded. Animal power and manure/fertilizer are often major outputs, but likewise are not captured in national statistics (WISP, 2008[10]).

Box 1: Significance of pastoralism for Africa (Source: IIED, 2010[11])

- There are an estimated 50 million pastoralists and up to 200 million agro-pastoralists in Africa.
- In **Chad** pastoral animals make up over one third of exports and feed 40% of the population.2
- The exports generated by **Ethiopian** pastoralists are second to coffee in generating foreign exchange. In 2006, Ethiopia earned US$121 million from livestock and livestock products.
- In **Kenya**, livestock raised by pastoralists is worth US$ 800 million a year.
- In **Mali** exported live animals were worth US$44.6 million in 2006.
- In **Mauritania** livestock contributes 70% of total agricultural GDP.
- In Southern Darfur, **Sudan**, calf mortality in migratory herds is 11% whilst in sedentary herds it is 40%.
- The traditional livestock sector in **Tanzania** produces 70% of the country's milk, which was 770 million litres in 2006.
- **Uganda's** pastoralist and smallholder livestock producers contribute 8.5% of total GDP.

- **Output could be further improved.** Very few countries have adopted pro-pastoralist policies – essentially pastoralists have been surviving and producing despite unfavourable policy frameworks. With the right kind of support, their output and share of livestock production could be further increased, while also capturing livestock's positive interactions with the environment. Targeted interventions can markedly decrease losses and increase output. For instance, in Rajasthan (India), it was possible to increase the camel population by around 25% through basic animal health inputs, prevention of thefts and creating opportunities for value addition within the span of five years[12].

Recommendations for action

Within the GAA process

1. Go beyond "natural resource efficiency" when assessing sustainability and include criteria such as biodiversity, nutritional quality of livestock products, animal welfare and rural employment into the criteria to be considered.
2. Be mindful of the limitations of "sustainable intensification" to achieve the goals of the GAA.

[8] Li, W., and L. Huntsinger. 2011. China's grassland contract policy and its impacts on herder ability to benefit in Inner Mongolia: tragic feedbacks . **Ecology and Society 16**(2): 1. [online] http://www.ecologyandsociety.org/vol16/iss2/art1/

[9] Krätli, S., Huelsebusch, C., Brooks, S. and B. Kaufmann. 2013. Pastoralism: A critical asset for food security under global climate change. **Animal Frontiers** 3(1): 42-50.

[10] WISP. **A global perspective on the total economic value of pastoralism:** Global synthesis report based on six country valuations. http://data.iucn.org/wisp/documents_english/TEV_Eng.pdf

[11] IIED and SOS Sahel. **Modern and mobile. The future of livestock production in Africa's drylands**.

[12] LPPS, own data.

3. Institutionalize the participation of pastoralist (and other small-scale livestock keepers') representatives in the GAA process and place emphasis on communicating scientific outputs in an easy to understand manner.
4. Develop methodologies ("metrics") to better measure the current and potential contribution of pastoralist production to global livestock product outputs.
5. Revisit the underlying – but probably unrealistic - assumption of the "need" to almost double livestock product output by 2050[13].

In policy making

1. **Appreciate and value pastoralism**. Pastoralism deserves credit as a highly sophisticated and ecologically valuable food production and land use strategy – the only means of **producing** food without replacing the natural vegetation! Because of lack of appreciation, many pastoralist systems have collapsed[14], leading to underuse and deterioration of rangelands.
2. **Modernize the image of pastoralism and create incentives. Y**oung people no longer take up pastoralism, because of its backward image, as well as associated hardships and legal uncertainty. By providing secure land tenure and re-casting pastoralists as ***eco-livestock producers,*** incentives can be created.
3. **Reorient subsidies.** Instead of promoting high-input systems by subsidizing fertilizer, feed, medicine and cross-breeding programmes, use the money to support extensive livestock production– for instance by providing access to affordable animal health care. Lack of disease treatment is commonly identified as the second largest constraint faced by pastoralists (after secure access to grazing) and leads to major losses**.**
4. **Establish secure grazing areas**. If pastoralists can count on secure grazing rights, then they will continue keeping livestock, especially considering the high meat prices.
5. **Recognise and capitalize on locally adapted livestock breeds.** These are the prerequisite for making optimal utilization of diverse eco-systems which would otherwise remain unused.
6. **Facilitate mobility** by keeping migratory corridors open, providing mobile services, and accounting for pastoralism in land use planning.
7. **Invest in creating local marketing infrastructure and value addition**. By means of organisational support, investment in infrastructure and the creation of special labels and trademarks, pastoralists can reap greater economic returns and benefits from their products[15,16.] (Social) entrepreneurs have a major role to play.
8. **Adopt the principle of "Livestock Keepers' Rights" (LKR).** LKR are a bundle of rights and policies whose implementation is considered urgent by livestock keepers themselves[17].

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[13] See Foley, JA et al. 2011. Solutions for a cultivated planet. **Nature 478**(7369):337-42 for a take on this.

[14] Dong, S., L. Wen, S. Liu, X. Zhang, J. P. Lassoie, S. Yi, X. Li, J. Li, and Y. Li. 2011. Vulnerability of worldwide pastoralism to global changes and interdisciplinary strategies for sustainable pastoralism. **Ecology and Society 16**(2): 10. [online] URL: http://www.ecologyandsociety.org/vol16/iss2/art10/

[15] Köhler-Rollefson, I. and Mathias, E. 2010. Animating Diversity: Supporting endogenous development of livestock keepers. **Development 53**(3), 425–428.

[16] Köhler-Rollefson, I., E. Mathias H. Rathore. 2008. Local breeds, livelihoods, and livestock keepers' rights in South Asia. **Tropical Animal Health and Production**.

[17] Köhler-Rollefson, I., E. Mathias, H. Singh, P. Vivekanandan and J. Wanyama. Livestock keepers' rights: the state of discussion Animal Genetic Resources, 2010, 47, 119–123.. http://www.fao.org/docrep/013/i1823t/i1823t13.pdf