

SHAPING POLICIES

to Support Socially and Ecologically Sustainable
Livestock Development in India's Rain-fed Areas

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THE RAIN-FED LIVESTOCK NETWORK



Vision Paper

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Summary

Indian livestock contributes to around 40 percent and 70 percent of the agricultural GDP in the semi-arid and arid regions, respectively. With increasing demand for livestock products, this sector has great potential to contribute to poverty alleviation, which is largely untapped. This demand can provide significant opportunities for the rural poor from rain fed regions to increase returns from their livestock resources.

India's genetically diverse livestock and poultry populations are a product of its traditional livestock systems. Policy-makers and programmes have consistently overlooked these systems in favour of the industrial-production systems using exotic and cross-breeds. It is time to understand their contributions and capitalise on the opportunities offered by the sector and create effective and coherent, holistic, pro-poor policies, alleviating institutional and technical constraints on a number of fronts as identified in this paper.

There is a likelihood of falling into a '*panacea trap*' if the diverse, location-specific perspectives are not clearly understood when creating solutions and evolving opportunities. The strategies must have specific, regional focus and the policies and programmes must be developed by involving the communities concerned. For the long-term success of these initiatives it is vital to build capacities of these communities and their institutions.



Introduction

In rain fed areas, livestock has advantages over crop cultivation. Animals are movable assets that can be shifted to areas where the rains have bestowed their bounty. In addition, and in contrast to land, livestock is a self-replicating asset. Over thousands of years, humans have benefited from the ability of cattle, sheep, goats, camels, and other herd animals to actively search out and convert natural vegetation into products and services that satisfy basic human needs: food, fibre, fuel, fertiliser and draught-power. In the current scenario of climate change and falling groundwater levels, it is especially important that we ensure these communities can carry out their activities without increasing their carbon footprint and stretching groundwater resources.

Economic dependence on livestock grows with increasing aridity. In India, the sector contributes 40 percent to the agricultural GDP in the semi-arid areas, and 70 percent in the arid areas (GoI, 2006). In view of the significant implications of extensive livestock keeping to the ecological and macro-economic aspects and to the livelihoods of the people inhabiting the less endowed, marginal parts of the country, appropriate public investment to secure and strengthen this land use strategy is vital. Unfortunately, while India's livestock sector generally remains underinvested¹, its existing livestock related policies and programmes have been especially unsuitable for contributing to poverty alleviation in drylands. The mainstream livestock development approach with its narrow focus on increasing milk and meat production is inappropriate for strengthening these complex and multi-functional livelihood systems.

The **Rain-fed Livestock Network** is a consortium of organisations that seeks to amend government policies, programmes and institutions so that they will better address the needs of small-scale livestock keepers² in rain-fed areas. Its overall goal is to bring about policy and programmatic changes in favour of improved and long-term sustainable livelihoods that are in harmony with local ecological conditions, i.e. conserve groundwater resources, minimise soil erosion and sustain biological diversity.

The purpose of this paper is to outline the ecological and economic principles of sustainable livestock systems in drylands, demonstrate the mismatch between existing government policies and programmes and the needs of livestock keepers, identify required policy changes and sketch an approach towards achieving those changes.

¹ Public investments in the livestock sector in comparison to its contribution to the GDP, dropped from 3.55% of GDP from livestock in 1990-91 to 2.06% in 2004-2005 (Kumar, 2009).

² According to FAO, "small-scale livestock keepers" include mixed crop-livestock farmers, pastoralists, and landless livestock keepers (FAO, 2009).

Livestock Systems in Rain-fed Areas

Livestock keeping has a long history in India, dating back several thousand years. Over this long period the local livestock, the vegetation and the ecosystem they depend upon and the societies and culture of the people— especially of those dependent upon livestock, evolved together. All three—people, animals, plants are interdependent and through a fine degree of balance, perfected over the millennia, they have come to sustain each other mutually.

India's traditional livestock systems have also bred and sustained India's genetically diverse livestock and poultry populations. India's livestock make a significant contribution to rural food and nutritional security, particularly in case of women and children. Rearing livestock has ensured sustainability of agricultural operations in its arid and semi-arid regions.

A large part of India's rain-fed areas can be utilised for food production only by using livestock. Nomadic, transhumant systems provide meat, milk, manure, draught power and other livestock products or services in regions where crop cultivation is extremely difficult and cannot sustain livelihoods. Such areas exist, for example, in the alpine pasturelands of the Himalayas, the seasonal swards of the Thar Desert and in the mangrove regions along the coast of Gujarat. While these systems do not depend on the usual agricultural inputs— fuel, fertilisers and pesticides, their continuance entirely depends on three critical components: people willing to pursue this arduous way of life, existence of traditional livestock breeds that can roam long distances in search of food and water and availability of relevant institutional arrangements— traditional, community supported, or otherwise.

Understanding the context in which these components exist and their interactions with each other and other environmental factors is crucial, if suitable policies that support socially and ecologically sustainable livestock development in India's rain-fed areas are to be framed.

The Social Milieu

Though it may appear that livestock keepers are a single homogeneous group, there are broadly three types of livestock keepers in India's rain fed regions. Mixed crop-livestock farmers who cultivate crops and rear animals (buffalo, cattle, goats, chickens) are one group, while small-holders, for whom keeping livestock is one among several income generating activities, form the next group. Specialised pastoralists who depend either entirely on livestock keeping, or which provides a major source of income, form the last group.

There are a large number of such pastoralists in rain fed regions. They do not own land and are critically dependent on access to the commons. In India, pastoralists keep almost all the camels and sheep and they are the traditional custodians of many of India's livestock breeds.

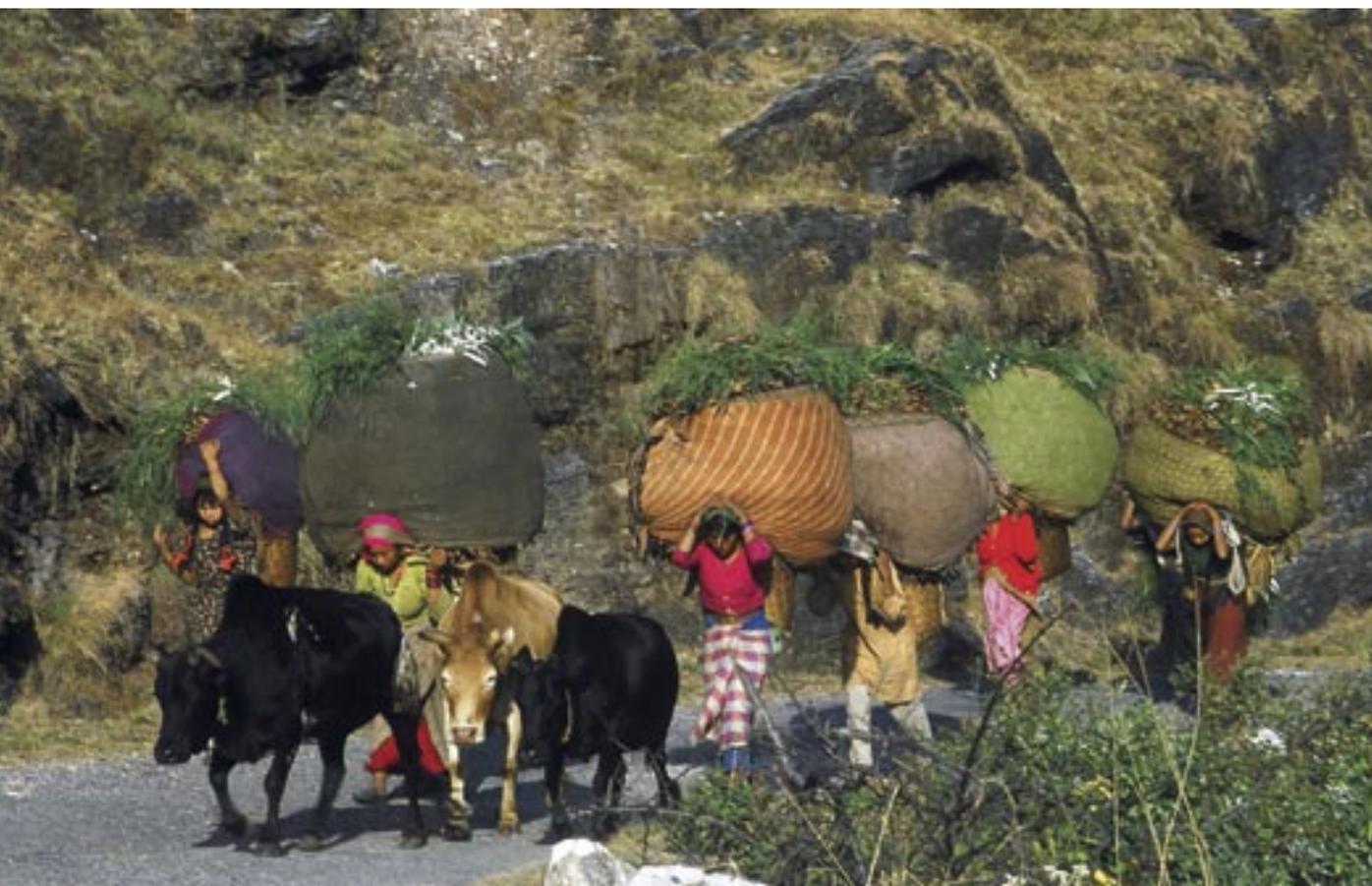
The close interplay between cultural and biological factors that is so typical of India's livestock systems is reflected in its myriad cultures that centre around the buffalo. This species is found in almost all of India's ecological zones. In the Himalayas, the *Van Gujjars* keep buffaloes in transhumant systems where the buffaloes determine when it is time to move. In the *Banni* grasslands of Kutch, the *Maldhari* have developed a breed that forages independently and comes back on its own for milking.

The *Todas* of the Nilgiri Hills have a highly sophisticated cultural custom in which they distinguish between sacred and profane buffaloes. They allow male breeding buffaloes to range freely in the wild. The tribals around the Chilika Lake in Orissa have a distinct breed that swims into the lake during the night and feeds on water plants. This breed is an integral part of the lake eco-system, as its dung sustains the fish population and a large number of insects that attract a huge population of migratory birds.

Marching Instep with the Times

It is often argued that the traditional, extensive livestock production systems are outdated. There are several reasons proffered. The 'lucrative' development options puts pressure on using 'idle' land and so land required for such systems will be in short-supply in many regions, is one. The indifference shown by young people to traditional vocations is another point of argument. The inability of these systems to provide sufficient, affordable products for India's burgeoning urban population is yet another line of reasoning.

Therefore, the sceptics say, establishing intensive, high-input—high-output systems with high performance breeds in peri-urban locations should be the preferred strategy and there is no need to be concerned about preserving indigenous production systems. However, a number of powerful arguments speak against embarking on this course, as discussed in this paper.



People and Communal Institutions

These livestock keepers and pastoralists have nurtured many community institutions that have guided these communities over the centuries. At the village level many important institutions have developed around cattle. Traditionally these include the *gual*, or the cowherd employed by the village; the *gochar*, the village grazing ground and the *godda*, or the village bull.

The institutions and value systems of pastoralists have ensured the sustained, long-term functioning of their systems. For instance, some groups place a ban on constructing permanent houses, on selling off female breeding stock. They have recommendations for castrating male animals deemed unfit for breeding and so on. (LIFE Network and Köhler-Rollefson; Virmani and Das, 2010).

These pastoralists have developed a large body of traditional knowledge relating to all aspects of animal breeding and management, on vegetation and grazing management, which has served them well.

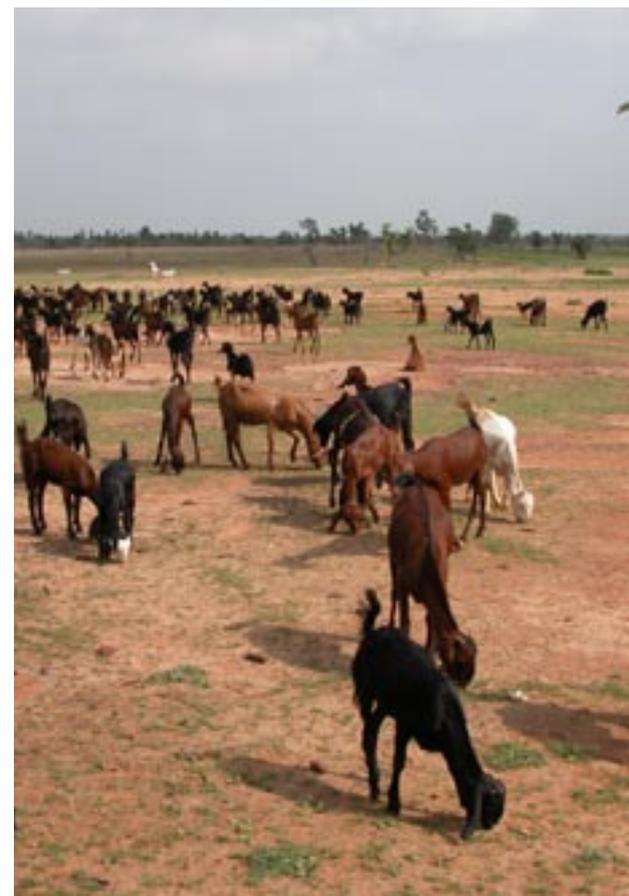
Traditionally, the *Maldhari* and *Rebari* of Gujarat bred cattle to supply draught animals and manure to farmers. These pastoralists developed some of the better known Indian cattle breeds, such as *Kankrej* and *Sanchori* (Köhler-Rollefson and LIFE Network).

In some pastoral cultures of Rajasthan ‘livestock in-breeding’ is considered a sin and avoided assiduously. There are specialised castes that castrate male cattle deemed unfit for breeding, ensuring scrub-bulls are absent around villages. A committee of local experts carefully select village breeding bulls, as known in case of the *Ongole* cattle breed. (LIFE Network and Köhler-Rollefson, 2007). The *Kuruba* of Karnataka use controlled inbreeding to achieve genetic homogeneity in desired production traits.

It is due to the traditional knowledge and institutions of these pastoralists that India’s cattle breeds— the *Sahiwal*, *Gir*, *Ongole*, *Tharparkar* and *Kankrej* evolved. These breeds provide a consolidated gene pool that contributes significantly to India’s milk production till today and which have been further improved in countries like Brazil.

Academic Prejudice

India’s rich heritage, in which livestock were traditionally raised as part of the natural environment, has been all but ignored. The state and its scientists have appropriated livestock breeding. Some sections of the scientific community and bureaucrats disparage traditional livestock keepers and their customs, terming them backward and deficient in scientific animal management.



This intolerance ignores the fact that it was these communities or the patronage of local rulers, in some cases, that helped create India's traditional breeds (Köhler-Rollefson and LIFE Network, 2007). Many traditional breeding institutions have weakened over the years. However, without them, the famous Indian cattle breeds would have never evolved.

Despite the documented knowledge among traditional Indian pastoralists, it is clear that not all livestock keepers are equally knowledgeable or pay such close attention to breeding. This holds true, for example, for many *Adivasi* groups who started raising goats fairly recently and relate differently to their livestock than traditional pastoralists such as the *Golla* or the *Dhanghar* of the southern Deccan Plateau, who have shifted from large ruminants to small ruminants.

Uncommon Common Property Resources

Livestock in India's rain-fed areas are sustained exclusively or largely on common property resources (CPRs), in the form of *gochars*, *orans*, forest, revenue land, fallow fields and others. A combination of climatic, historical and ecological factors explains this dependence on CPRs.

The monsoons limit rainfall to three or four months of the year in most areas and in the absence of irrigation, only one crop can be grown each year. In contrast, the native trees and shrubs on uncultivated land sustain livestock throughout the year. From an ecological perspective too, crop cultivation is unviable or risky in low rainfall areas increasing dependence on the commons for fodder. Historically, commoners could not own land in India's old, feudal society and therefore had to source food and other materials from areas not owned by the state or its beneficiaries.



The CPRs have different types of vegetation, depending on their usage and the historical and current governance systems. *Gochars* provide grazing land, especially for cows, and hence they have a mix of grassland and trees. *Orans*, traditionally considered to be under the protection of local deities who prohibit tree cutting, have large stands of mature and old trees. They are generally closed for grazing, but are available as emergency grazing reserves during droughts. The forests were the hunting grounds of the feudal class, who however accorded grazing privileges to some pastoralists.

As the Commons are rich in biodiversity, they provide nutritional diversity, with the seasonal variations providing a healthy, balanced diet for the livestock. The fodder from the commons is less sensitive to drought than crops, which are dependent on the monsoons or on irrigation sources.

This prevailing dependence of the Indian livestock on natural vegetation is a major difference from livestock systems of



Europe and North America where livestock are mostly stall-fed and consume specially cultivated feed and fodder or that produced in factories.

The Commons — a critically important resource for India’s resource-poor pastoralists that constitutes nearly 21 percent of the Indian landmass, are gradually being usurped for other uses due to developmental, societal and other pressures.

The CPRs are under the domain of various departments, especially the Forest and Revenue Departments, whose mandates have nothing to do with livestock production. On the other hand, the Animal Husbandry departments at the state and central level are not concerned with issues arising out of lack of access to CPRs. This is partly due to a very narrow technical focus on animal health and partly because their training in the western mould leads them to subscribe to systems with stall-kept animals that must be fed carefully calculated, ‘balanced rations.’

A large proportion of the common property resources have either been alienated or access is banned or restricted. According to the Planning Commission “*In the last few decades, the Government policies of protecting forest areas and not permitting sheep flocks to graze have brought immense miseries to the sheep farmers. They are getting haunted from place to place and prosecuted by the forest officers for grazing in the reserved areas.*” (GoI, 2003).

The traditional institutions that governed village grazing grounds have disintegrated. Common lands are today viewed as ‘wastelands’ and so become sites for bio-fuel cultivation, corporate contract farming and industrial zones. In many rain-fed areas of Karnataka, Andhra Pradesh and Tamil Nadu, CPRs have virtually disappeared and this is perhaps increasingly true for other places in India.

Indigenous Livestock Breeds

Adaptability to Local Ecosystems and Diversity

Centuries of efforts by India's pastoralists and livestock-keepers in raising livestock on natural vegetation has led to a large diversity of breeds that are adapted to very specific eco-systems. These breeds have the impulse to forage for themselves, and have learnt how to access the various feed resources in their territory³. This *learnt* behaviour is not passed on easily among animals from different herds or regions. For instance, it has been noticed that camels from the sandy deserts have great difficulties in adapting to the vegetation of the Aravalli Hills.

Mobility is crucial, because it lets animals feed when the vegetation is rich in nutrients. It also gives plants the opportunity to recover from grazing. Animals kept in nomadic systems often indicate to their owners when it is time to move to new pastures or leave for seasonal migrations.

In order to utilise the vegetation in rain-fed areas, local livestock breeds have developed certain traits (Köhler-Rollefson and Mathias, 2010):

The ability to walk long distances

Many local breeds, especially the ones belonging to nomadic communities such as the *Gaddi* or *Raika*, exhibit a stupendous ability to walk long distances. Their sheep walk thousands of kilometres each year in search of high alpine pastures or harvested fields in fertile areas. As a result, these breeds make a significant contribution to food security because of their special abilities that enables usage of vast tracts of land in India.

Drought resistance

Livestock in semi-arid and arid areas are subject to relentless pressures of natural selection that ensures the ability to endure drought. Only animals that can adjust (lower) their metabolic rate to make do with available feed resources survive. This capacity is well developed among Indian breeds (Western and Finch, 1986).

This is in stark contrast to the high metabolism of high performance livestock in intensive systems. It ensures maximum output and is the reason why they are selected. However, in nature, there is a trade-off between production and adaptation. Observers note that the most productive animals in a herd succumb first in times of drought.

³ See Krätli (2008) on how the ability of livestock to ingest a wide variety of vegetation is *learnt* behaviour, passed on in the herd from generation to generation, and also selected for by pastoralists.

The ability to adjust metabolic rate to the fluctuations in availability of fodder is crucial not only during droughts, but in the general prevailing scenario. The fodder deficit in India is estimated to be 11.20 percent in case of dry fodder, 27.66 percent for green fodder and 34.45 percent in case of concentrates (GoI, 2006).

Ability to ingest and digest roughage

Local breeds can not only exploit the natural vegetation of their environment, but also make do with low grade crop by-products that are high in roughage. Therefore, they are not dependent on expensive concentrate feeds⁴.

Thermoregulation

Local breeds can naturally deal with thermal stress, giving them an advantage over other breeds. Studies in Brazil have shown that the humped Indian cattle *Bos indicus*, is much more heat tolerant than the imported *Bos taurus*. (Carvalho et al. 1995).

Disease resistance

Breeds vary in their ability to cope with diseases. Some traditional breeds are resistant or can tolerate specific infections that can be dangerous to exotic breeds. The *Sahiwal* and other *Bos indicus* breeds are more tolerant to ticks and other blood parasites (Perry et al. 2002, Hoffmann 2008). The Foot and Mouth Disease barely affect native cattle. According to their breeders, the *Nari* cattle of Rajasthan do not really suffer from any diseases.

Fertility and good mothering instincts

Sterility is a regular problem in exotic and cross-bred cattle. However, local breeds rarely exhibit such afflictions. They also have strong mothering instincts and fearlessly defend their young against predators. Breeders have done away with the brooding instinct of commercial chickens over generations since it interfered with continuous egg production. As a result, these birds can no longer reproduce naturally.



⁴ As grain prices escalate and competition for arable land increases (both in part due to bio-fuel production) this is likely to turn into a major advantage over high yielding (but expensive to feed) breeds of beef cattle and pigs that have been selected for high killing out percentage, i.e. against the large intestines that enable them to digest roughage (Ørskov 2008).



Backyard Poultry

Poultry is one of the fastest growing segments of India's livestock sector today. While agricultural crop production has risen at 1.5–2 percent per annum, the production of eggs and broilers has been rising at a rate of 8–10 percent per annum. However, backyard poultry (BYP), which is based almost entirely on native birds, has been by-passed by the poultry revolution.

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According to recent statistics, 52 percent of India's bird population is kept in backyard poultry systems and contributes 23 percent of the total number of eggs produced. While the population of native birds increased from 188.36 million in 1997 to 238.21 million in 2003, with a growth rate of 8.3 percent per annum, it is decreasing in relative terms, due to an increase of improved layers (FAO 2008).

Policy makers have focused on the large-scale 'confined and intensive' (or industrial) sub-sector, turning the country into the 4th largest egg producer worldwide (GoI, 2006). But there have been no benefits for the small indigenous bird producers from this development. As a result, the indigenous poultry population that was 50 percent of the total poultry population, declined to 10 percent within a span of 30 years (Rangnekar and Rangnekar, 1999).

Even programmes addressing backyard poultry aim to replace indigenous breeds with exotics or cross-breeds, which are poor scavengers, are non-broody in nature, cannot cope with predators and are dependent on external inputs. These birds can no longer breed by themselves, leading to a continual dependence on hatcheries run by government farms or private players. Promotion of these improved breeds not only threatens the survival of the population of indigenous breeds, but also leads to increased outbreaks of various diseases.

This development goes against principles of socially and ecologically sound development, since BYP efficiently utilises locally available resources, provides jobs opportunities and economic and food security. It is also environmentally friendly and energy independent — an important consideration in the current scenario of power shortages and climate change.

Livestock Development —A Blinkered Vision

Since its first Five Year Plan the Indian government has emphasised livestock development with an absolute focus on improving productivity. The government and some NGOs have argued that ‘more productive’ breeds would provide higher incomes and help reduce poverty. This has resulted in an unending series of cross-breeding and breed improvement programmes. From the Fifth Plan, selective breeding was ignored and cross-breeding considered supereminent and was the only choice. Since the Ninth Plan, interest in indigenous breeds revived but this did not translate into effective interventions for strengthening local breeds (Sadana, 2009).

At the root of these flip-flops is the failure to recognise the value of the multi-functional nature of local breeds. When productivity is evaluated in terms of output of products, it does not take into account the value provided by livestock to livestock keepers and other stakeholders through essential services such as transport, credit (‘banks on hooves’), landscape conservation and environmental protection, thereby resulting in biased evaluations (Gura, 2008).

India is not unique among developing countries to adopt a tunnel vision with respect to livestock development and in its failure to take into account the multi-functional asset function of livestock for poor, rural communities. A recent paper from Ethiopia notes: “The livestock wealth of communities in Africa is not merely a source of food, or a means of income, or a marginal enterprise. Rather, it is a much more important asset that buffers livelihood shocks due to failures of inert resources and enterprises, absorbing production risks that happen in more risky farm enterprises, building assets for vulnerable communities and saving lives under desperate socio-economic circumstances. This way, it significantly contributes towards achieving food security at the household level.

The Government of Ethiopia needs to revise the structure of the current livestock improvement programs and must note the important details that influence the production, marketing and utilisation of livestock products. The smallholder community in this part of Ethiopia depends on semi-subsistence agriculture and so livestock development interventions should focus on reproductive and adaptive traits that stabilise the herd structure, rather than focus on traits that are only important for commercial purposes (Kassie et al., 2010).



This *idée fixe* about livestock ignores a growing number of comparative studies in other countries and even in India, which point out that within their own production systems and *especially where* environmental conditions are harsh, local breeds are well positioned to compete with 'improved' breeds in terms of productivity (Intercooperation, 2000; Anderson, 2003; Ayalew et al. 2003). While their output may be lower, local breeds require fewer inputs, so they often provide better financial returns to the farmer (Anderson 2003, Scarpa et al. 2003). This advantage is not only accrued at the farm level, but also at the macro-economic, national level when all costs required to set up breeding programmes for exotic breeds are factored (Rege and Gibson 2003).

The Economic Context

A report by the Planning Commission indicates that livestock ownership is somewhat evenly distributed among the rural population (as compared to land) with poor, landless people being the major stakeholders in livestock development.

In rain-fed areas livestock provide the major source of income and is far more important than crop cultivation. For example, native poultry provide an annual income of around Rs.2000 per unit (four hens), which is equivalent to the income generated from crops grown on one acre of dryland. It is especially important for the financial security of women who benefit from the niche market for these birds; which have a lower fat content and their eggs. The prices per kg live weight are 50–100 percent higher than that of industrially produced birds (Conroy et al 2005).

The steady growth of this sector, in spite of deficient government investment and support, owes much to the poor.

Indian livestock contributes to around 40 percent and 70 percent of the agricultural GDP in the semi-arid and arid regions, respectively. With increasing demand for livestock



products, this sector has great potential to contribute to poverty alleviation, which is largely untapped. This demand can provide significant opportunities for the rural poor to increase returns from their livestock resources.

However, effective and coherent pro-poor public policies, alleviating both institutional and technical constraints are crucial to capitalise on the opportunities offered by the sector.

For improving access to markets and improving economic returns, multiple policy issues must be addressed at different levels that take into account the role of producers, traders, processors and consumers. The changes promoted by policies and programmes must benefit the poor and be consistent with longer term processes of pro-poor institutional, ecological and economic development.

Role of Livestock in Providing Sustainable Livelihoods

In dryland production systems, animals are *multi-functional*. Besides being a source for food and fibre, they provide agricultural inputs (manure and draught-power), play an important socio-cultural role and for an ‘asset-poor’ pastoralist or smallholder, the importance of their value as a bank-on-hooves, and as an insurance and buffer against bad times, are undiminished. Livestock also cement social relationships among pastoralists and are often loaned for long periods.

Jahnke (1982) distinguishes the following functions of livestock:

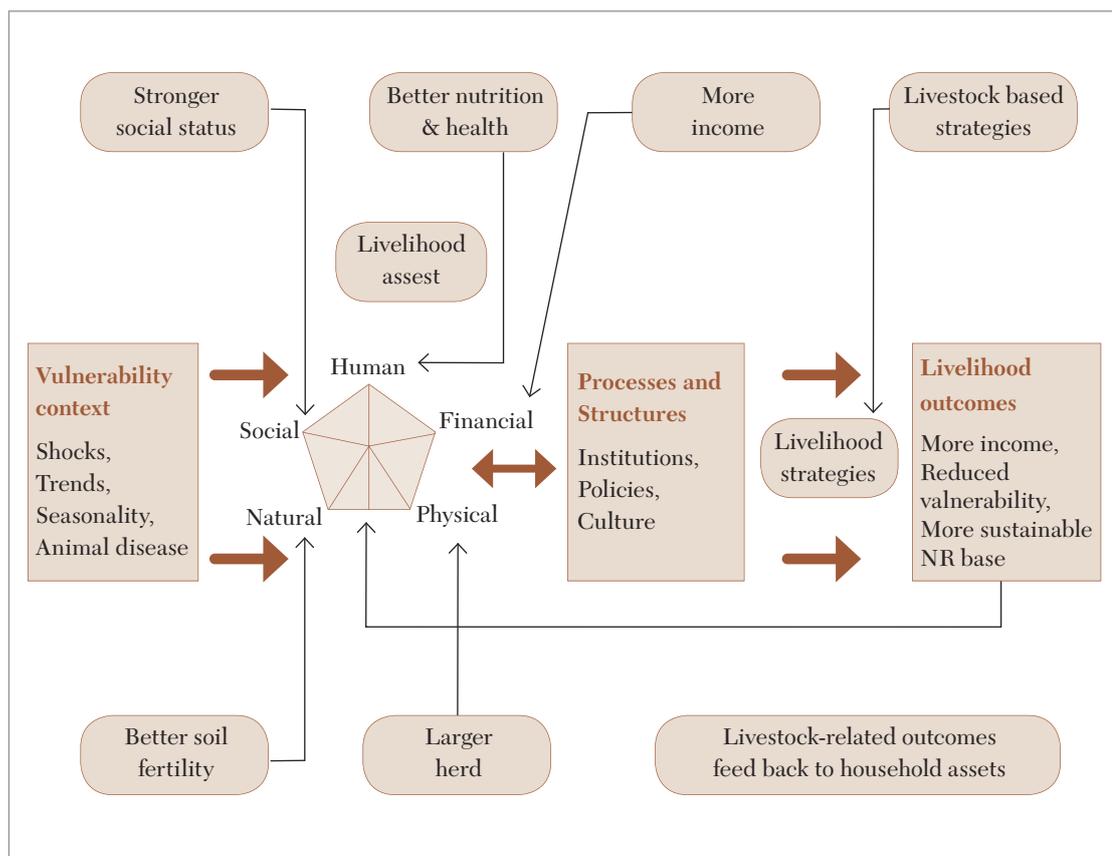
- Output function – production of food and other products for home consumption, or are sold for cash
- Input function – livestock provide inputs that increase productivity, i.e. manure, draught-power or access to CPRs
- Assets and security functions of livestock as a risk reduction strategy and as a bank on hooves.
- Social and cultural function of livestock

Specialised livestock farming systems that maximise output of only one product (e.g. milk or meat) cannot fulfil these multiple roles. People become dependent on various purchased inputs (genetically superior animals, special feed, special housing, expensive high-quality animal health care and so on) and thereby become more vulnerable to stress. These animals also do not fulfil social and cultural functions, since the bond between man and animal is dictated more by economics and function.

The ‘sustainable livelihood approach’ developed in the 1990s by Chambers and Conway (1991) is useful for understanding and appreciating the role of multi-functional livestock in securing sustainable livelihoods. According to this model there are five types of livelihood assets: natural, social, physical, financial and human.

A sustainable livelihood is defined as follows: “A livelihood comprises people, their capabilities and their means of living, including food, income and assets. Tangible assets are resources and stores and intangible assets are claims and access. A livelihood is environmentally sustainable when it maintains or enhances the local and global assets in

Figure 1: The role of livestock in rural livelihoods and its contribution to strengthening various types of assets.



Source-Randolph et al., 2007.

which livelihoods depend and has net beneficial effects on other livelihoods. A livelihood is socially sustainable which can cope with and recover from stress and shocks and provide for future generations.”

In line with this definition, Figure 1 below (courtesy Randolph *et al.*, 2007), depicts how livestock strengthen various types of assets and their role in rural livelihoods thereby meeting the definition of ‘sustainable livelihoods,’ as given above.

Market Access

In absence of adequate support to small-scale livestock keepers and access to livestock markets on equitable terms, there is a greater probability that resource rich farmers and commercial producers of livestock products would corner the market, bypassing the poor. In addition, the dangers to indigenous breeds stemming from current distorted policies and programmes that favour markets for modern breeds has been detailed earlier.

World markets have been reshaped by the GATT and the Indian government’s EXIM policy of 2001, which removed restrictions and allows free import and export of most livestock products with no tariffs and anti-dumping duties. This presents both an opportunity and a threat to the Indian livestock sector. World trade in livestock products is heavily distorted. Governments of many developed countries, or which have major producers of livestock-products provide considerable support to their producers.

On the other hand, the Indian small-holder livestock producer gets negligible support. Continuing distortions in world trade that bring cheap imports adversely affect domestic producers, especially the small-holders and pastoralists. The small-holder livestock keepers also stand to lose because of their inability to meet food safety standards. This directly impacts their ability to access both the global and local markets.

Cost of Poor Livestock Health

The livestock population in the country increased from 292.80 million in 1951 to 484.98 million in 2003 at annual growth rate of 2.32 percent. Statistics reveal that many farmers and shepherds face high losses due to increasing incidence of disease in animals. Animal diseases are estimated to account for roughly 10 percent or higher of the annual value of the output from the livestock sector.

India has more than 52,000 veterinary hospitals, dispensaries and other health care facilities administered by the State Animal Husbandry Departments (Kumar, 2009). Yet, provision of primary health services for livestock in rain fed areas remains a key constraint. The diverse composition of livestock and varying nature of livestock production systems raises the challenge further. The current governmental health services are inadequate to address losses incurred due to morbidity and high mortality rate as the focus has primarily been on Artificial Insemination (AI) for large ruminants with limited outreach to remote areas.

The public veterinary health care system does not address animal health in a holistic way. It is narrowly defined in two blocks [a] Prevention (de-worming and vaccination) and [b] Treatment. The current treatment system is symptomatic with a target based approach in place, in which production and health aspects are compartmentalised. Preventive and diagnostic interventions are very limited, while curative services are provided haphazardly and are usually limited to occasional ‘camps’ where treatment is provided free. The number of qualified veterinarians is very low in comparison with the livestock numbers. There is no accountability to livestock keepers from state animal husbandry departments and their officers.

Dangers of Industrial Livestock Production

FAO’s latest State of Food and Agriculture Report (FAO, 2009) focuses on livestock and signals the growing international concern about the industrial livestock sector. It warns that the rapid growth of this sector has led to systemic risks with serious implications for livelihoods, human and animal health and the environment. Some analysts also point to the social costs. In the US, family farms lost their competitiveness and have virtually disappeared. The same is happening in Europe where medium-sized dairy farms – ones having 150-200 cows – are no longer able to stay in business. In the North, most livestock keepers have already lost their breeding function and end up buying new batches of animals along with the required inputs – feed, medicines, etc. They are caught in a cleft between input providers and supermarkets and have no negotiating power, of any sort, left. Increasingly, livestock genetics companies belonging to multinational conglomerates also control the fertiliser, feed and veterinary markets (Gura, 2008).

Environmental Contribution of Livestock

The substantial eco-system services provided by livestock in traditional systems remain unacknowledged. Livestock are seen as the main cause for overgrazing and desertification and their presence is considered to be at odds with wildlife conservation.

However, in addition to its economic importance, extensively kept livestock provide a range of benefits to the environment. It provides agro-ecosystem services (FAO, 2009). These include the creation of highly bio-diverse, mosaic landscapes through grazing, dispersal and scarification⁵ of seeds through dung. Their footprints create mini-habitats in which insects or amphibians can reproduce (as in the case of the Chilika buffalo). Often domestic animals sustain local predator species as in case of the Asiatic lion of the Gir Forest. Their constant grazing keeps the landscape open attracting migratory birds, as observed at the Bharatpur Sanctuary. Grazing improves the water-holding capacity of grasslands by enhancing infiltration and reducing run-off. It helps prevent forest fires, as seen in Rajasthan's Kumbalgarh Sanctuary and restores and maintains soil fertility through manure and nutrient recycling.

In Europe, the onset of stall-feeding changed the ecology of the countryside (Redecker et al., 2002). In Germany, loss of grazing pressure is threatening the rejuvenation of certain forests where some endangered plant species depend on grazing for survival. For these reasons, controlled grazing by ungulates has become the most important and frequently employed biodiversity conservation measure.



⁵ Scarification means that the seeds of some trees can only germinate after having passed through the gut of a ruminant.



A Call for Action

The Rain-fed Livestock Network believes that there is a need to address livestock issues in a holistic manner, taking into account the location-specific, interconnected nature of the issues and understanding the ‘cause and effect’ relationships is necessary, given the complex circumstances of the day. It is only by developing such an understanding that the government, NGOs and other stakeholders can evolve policies and programmes that ensure complete and self-contained livestock systems.

The Network envisions a vibrant, Indian livestock sector, especially in the marginalised rain-fed regions, which is the outcome of a holistic approach in policy-making involving socially, ecologically and economically sustainable initiatives that take into account the knowledge and contributions of India’s pastoral and small-holder livestock keepers and their indigenous breeds and ensures that they benefit from the modern world has to offer without causing a disruption in their customs, traditions and way of life.

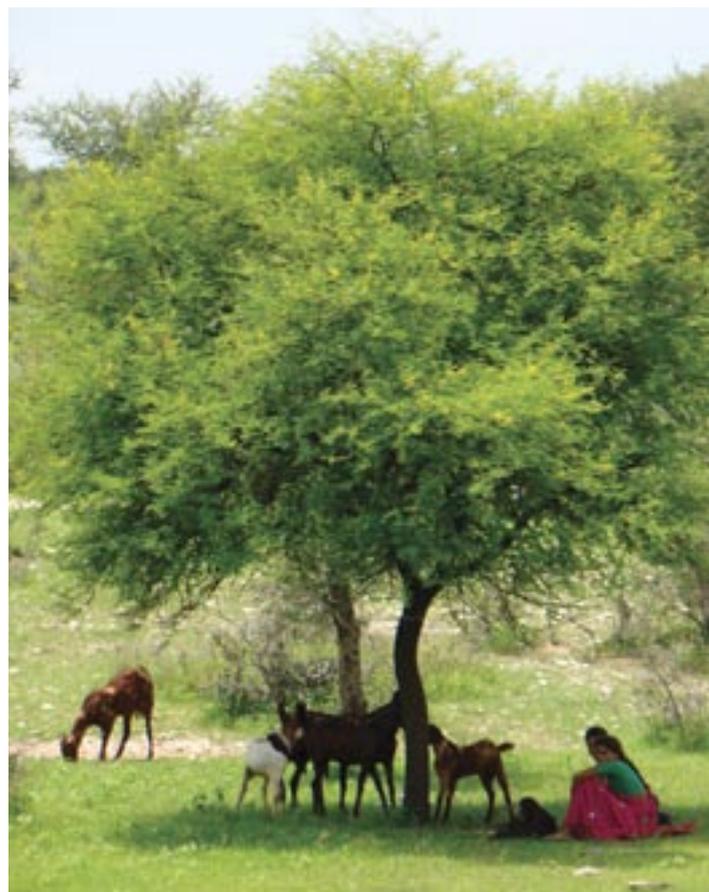
To achieve the same, the Network proposes that the policies and initiatives support socially and ecologically sustainable livestock development in India’s rain fed areas. These policies and programmes must address the core issues raised earlier in this paper.

People and Institutions- Empowering and Capacity Building

We need visibility, recognition and revival of traditional institutions that created and enabled low-input ecological land use for so long and which are important part of India’s cultural heritage. In many instances these institutions have already crumbled, but where they exist they must be strengthened, supported and their contributions highlighted.

In this era we also need new institutions, such as breeder’s organisations and livestock keeper’s associations that can represent the interests of these communities in a sustained and strategic manner to the government.

The capacity of both these new institutions and communities must be built in various areas so that they can fight meaningfully for their rights and be able to hold relevant government bodies (e.g. animal health



providers, forest department, etc.) accountable, where required. These organisations and communities must be so trained that they provide leadership and can participate in policy development.

Improving capacities and awareness of livestock keepers will help in substantially increasing the gains from livestock keeping. For example, livestock meat markets continue to trade in numbers rather than considering live weight. Raising community awareness and forming associations can help remove such unfair trade practices. Simultaneously, a better understanding of safe and hygienic production practices will increase the presence of poor livestock keepers in the livestock market.

Securing Common Property Resources- Fodder, Grazing Access Rights

In order to preserve the ecological way of keeping livestock and to ensure livelihood protection CPRs must be secured, wherever it is still possible to do so. Some recommended measures to protect the commons and the rights of the small-holders and pastoralists include conversion of revenue land into grazing land, providing designated corridors for migration, strengthening village level institutions, ensuring earnest implementation of the Forest Rights Act and the United Nations Convention on Biological Diversity (CBD), a legally binding international agreement to which India is a partner.

Breed Conservation and Development- Strengthening Livestock Diversity

The absence of a database on the key characteristics of native breeds, their populations and tracts and virtually no regular monitoring of their performance indicators has seriously affected conservation strategies and the promotion of animal genetic resources. This needs to be remedied soon through suitable government interventions using the resources of research institutes and NGOs and by involving pastoralists and small-holders.

In order to conserve livestock biodiversity, we need a paradigm change from ex-situ conservation on government farms to community-based conservation. The only way to do achieve this is by providing livestock keepers with an enabling environment. This would include secure access to resources as well as support with value added product development.

Other recommended approaches include systematic selection programmes for indigenous breeds, development of Bio-cultural Protocols⁶ that result from an understanding of the economic potential of local breeds and of traditional, village-based breeding institutions while empowering associated communities.

⁶ Bio-cultural protocols are documents prepared by representatives of livestock-keeping communities in consultation with lawyers and specialists on indigenous knowledge. They detail the community's breeds, its traditional knowledge of the animals, and its lifestyle in relation to the environment. They put on record the community's role in the management of biological diversity – its livestock and its contribution to managing the ecosystem.

Strengthening Backyard Poultry Systems

There is need to put more efforts in strengthening BYP systems to make it a lucrative source of livelihood. In the context of climate and weather variations and associated crop failures, this system must become the fail-safe, safety-net for small and marginal farmers. Developing an appropriate strategy for promoting and strengthening backyard poultry calls for a better understanding of the varied and complex production systems under which these birds are raised. Their importance (socio-economic) to the household and the key problems faced across different locations must be grasped clearly.

There is sufficient evidence to demonstrate that the economics of raising BYP can be significantly improved by provision of better health services that includes timely vaccination (Dolberg, 2003). Some of the suggested measures include para-vet training, mass vaccination, pro-poor packaging of vaccines and cold chain maintenance, conservation of pure native breeds (*deshi*). It also demands marketing linkages between producers and consumers and development of a certification system for products from indigenous breeds. The last step will prevent industrial producers from reaping benefits by keeping coloured birds producing brown eggs under their commercial systems.

Several studies across India clearly highlight the positive impact of the delivery of regular healthcare services, constant supply of vaccines and of improved management practices on the economics of backyard poultry keeping. With even minimal technical inputs, NGOs such as Anthra (<http://saplpp.org/goodpractices/small-holder-poultry/SAGP25-unpacking-the-poor-productivity-myth/>), the Bastar Integrated Livelihoods development programme in Chattisgarh, and the DANIDA initiative have demonstrated that net income from BYP per household can go up by 200 percent (Rs. 4000 to 5500 per annum.)



Holistic Approach to Rural Economic Development and Livelihoods

Policy makers must devise appropriate livestock development strategies and programmes in rain fed areas that take care of the needs and priorities of poor-livestock keepers and pastoralists, while considering the different agro-eco-climatic zones and livestock production systems.

Livestock development for poverty alleviation calls for a paradigm shift from maximising production to providing an enabling environment for the poor that helps them to capitalise on locally available resources. Several examples can be quoted to illustrate this. For instance, the new millet varieties developed increase grain yield at the expense of stalk length. This reduces livestock feed, making a farmer's livestock more vulnerable to drought. Another example: the potential for generating additional and increased income by supporting processing of livestock products (spinning and weaving, dairy processing, etc.) has been overlooked and must be developed considering region-specific solutions.

Enabling Macro-Economic Policies

Domestic production would bear the brunt of continuing distortions in world trade, unless they are protected from cheap imports. India has a strong case at the WTO for reducing such distortions. Further, India is not under obligation to reduce domestic support, as the current level of domestic support to the livestock sector is less than 2 percent. This is below the WTO limit of 10 percent. India should also take advantage of green box clause that exempts general services and poverty-oriented developmental programs from its reduction commitment and support livestock production for the benefit of the poor⁷.

Conflict between Industrial Livestock Production and Long-Term Food Security and Food Sovereignty

Support for industrial-scale livestock systems would make India dependent on imports of soybeans and corn in the near future, besides having further damaging the lives and livelihoods of rural livestock producers. The Chinese example provides a stark warning. China was self-sufficient in soy bean production until 1995, but now imports a whopping 74 percent of its soybeans (2005). [Source: <http://www.worldwatch.org/node/5442>]. This exponential growth is not just the result of increasing meat consumption, but because of the switch from local pigs that fed on kitchen and agricultural waste to exotic pigs imported from Canada that can only feed on special concentrate that uses soybean.

⁷ Smallholder livestock production in India: Opportunities and challenges; Proceedings of an ICAR-ILRI international workshop held at National Agricultural Science Complex, DPS Marg, Pusa, New Delhi 110012, India, 31 January-1 February 2006.

Market Access and Incentives for Rain-fed Regions

Support to marketing efforts has conventionally focused on dairy-related activities in the high potential areas with hardly any investment in drylands, despite their considerable potential and the non-availability of suitable options for their inhabitants. Where these communities are provided opportunities and support, they demonstrate the transformation that is possible. In Kutch, for example, the *Maldhari* community and a NGO (Sahjeevan) urged for installation of cooling tanks, which dramatically raised milk collection from this arid region. Camels are another important source of milk in the arid areas, but dairy organisations refuse to make minimal investments for collecting and processing camel milk.

Meat marketing remains an untouchable subject. The official unwillingness to engage with a politically sensitive issue has ensured that meat is sold entirely in the unregulated, grey sector. A few state-of-the-art abattoirs cater to the export market. However, the Indian consumer has no access to such services and buys meat from the local butcher. Such an approach is harmful to food hygiene and animal welfare.

A number of interventions are required in this area. More investments are needed for establishing dairy infrastructure in drylands, for developing hygienic slaughter houses. Development of niche markets for speciality products requires a different level of support, possibly involving tie-ups with private enterprise and micro-finance institutions.

In the poultry sector too the current market tie-ups between producers and consumers for native birds are inadequate. A premium market already exists, mainly because of economic and cultural reasons, which can be systematically explored and strengthened.

Revitalising and Strengthening Primary Health Service Delivery

In the primary livestock health services area there is a need to look at different institutional arrangements and operational mechanisms in order to strengthen service delivery. There is a need to put forth a more decentralised program that is 'area-specific' while simultaneously working on developing better institutionalised healthcare systems, universal vaccination and improved management practices.

There is a need to holistically view disease management systems taking into account overall animal production systems rather than compartmentalising health care into treatment and prevention of diseases. The new models for animal health care delivery must place more emphasis on disease monitoring and diagnostics and it must ensure the government service providers can be held accountable by village institutions.



Conclusions

Livestock can play many roles, depending on the desired outputs, the system used and its genetic foundation. Policy makers have to decide where their priorities lie. If India's goal is to use livestock as a vehicle for utilising marginal rain-fed areas for sustainable food production and generating income for rural producers, then the locally evolved livestock production systems must be strengthened. It is crucial to create space for these marginalised and poor communities and to build the capacity of livestock keepers to engage with the outside world – with markets, policy makers and other stakeholders.

There is good reason to believe that for the sake of long-term global food security, industrial systems must be curbed, as the earth's ability to produce grain is finite. The safest and most ecologically-sound approach to increasing livestock outputs is by securing, revitalising and developing the commons through the strategies mentioned above. Careful genetic improvement of local breeds may take some time and may not bear immediate results, but will help in the long run by reducing veterinary expenditure and by generating better and hygienic food products.

India's traditional livestock production systems are a precious resource that has been almost squandered away due to the general incomprehension and the lack of appreciation of its unique characteristics that helps combine sustainable land use with efficient food production. It is critically important to resurrect and nurture these traditional livestock systems by providing different incentives and legal entitlements to land use.

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