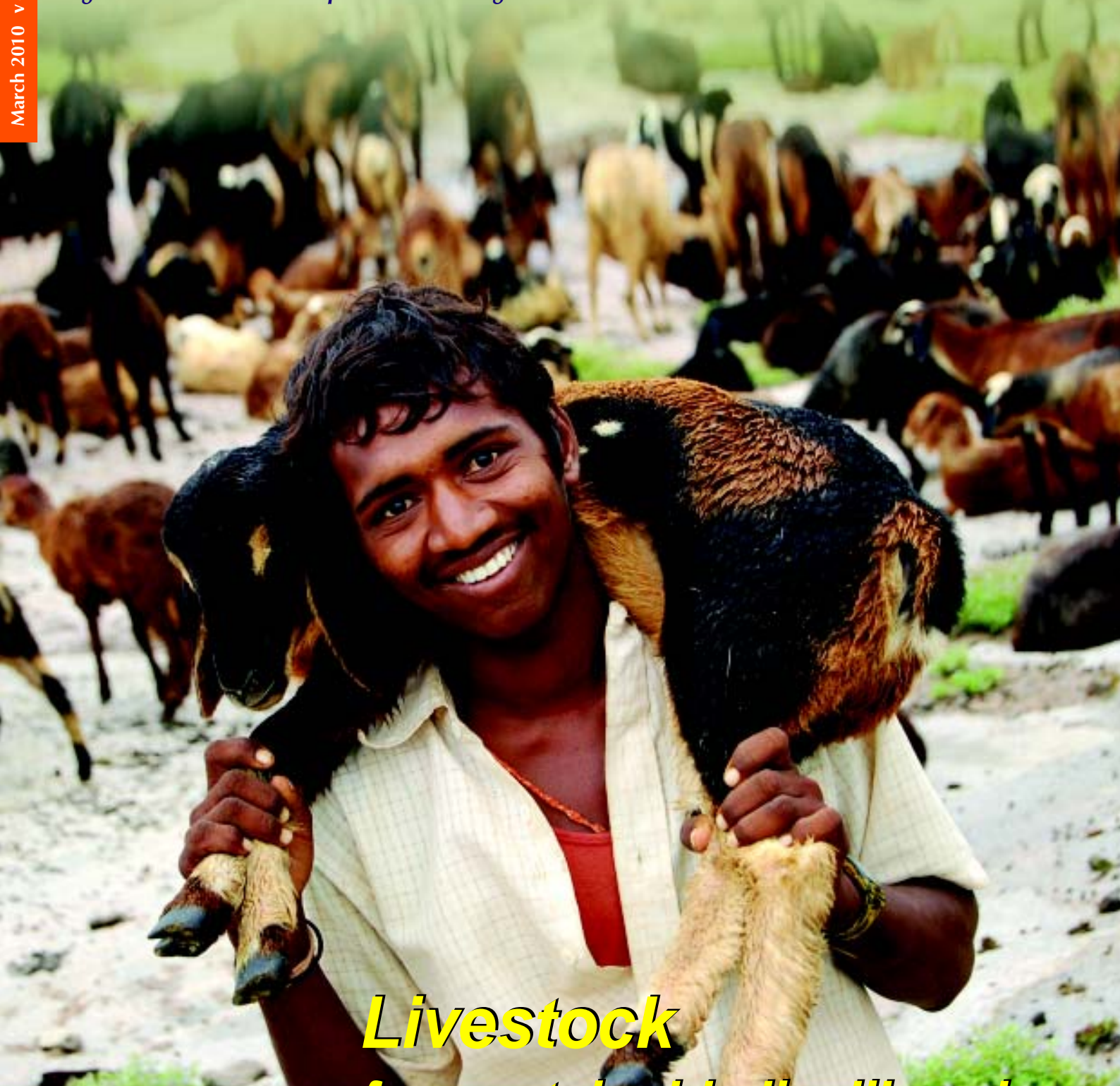


Magazine on Low External Input Sustainable Agriculture



LEIS INDIA



***Livestock
for sustainable livelihoods***



March 2010 Volume 12 no. 1

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*Small livestock - a source of income for the
dryland farmers in Mahabubnagar.*

Photo: S Jayaraj for AME Foundation

The AgriCultures Network

ILEIA is a member of the AgriCultures Network (<http://www.ileisa.info>). Farming Matters is published quarterly by ILEIA. Eight organizations of the AgriCultures Network that provide information on small-scale, sustainable agriculture worldwide, and publish are: LEISA Revista de Agroecología (Latin America), LEISA India (in English), SALAM Majalah Pertanian Berkelanjutan (Indonesia), Agridape (West Africa, in French), Agriculturas, Experiências em Agroecologia (Brazil), LEISA China (China) and Kilimo Endelevu Africa (East Africa, in English).

The editors have taken every care to ensure that the contents of this magazine are as accurate as possible. The authors have ultimate responsibility, however, for the content of individual articles.

The editors encourage readers to photocopy and circulate magazine articles.

AME Foundation promotes sustainable livelihoods through combining indigenous knowledge and innovative technologies for Low-External-Input natural resource management. Towards this objective, AME Foundation works with small and marginal farmers in the Deccan Plateau region by generating farming alternatives, enriching the knowledge base, training, linking development agencies and sharing experience.

AMEF is working closely with interested groups of farmers in clusters of villages, to enable them to generate and adopt alternative farming practices. These locations with enhanced visibility are utilised as learning situations for practitioners and promoters of eco-farming systems, which includes NGOs and NGO networks.

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Dear Readers

Livestock is an important component in the rural livelihoods providing manure, food, fuel and income to the poor households. Though a lot is being done in promoting commercial production of livestock, livestock as a means of livelihoods has received little attention from the government and the policy makers. A number of grass root initiatives show that sustainable development is possible if small livestock is integrated with the farming systems. We have made an attempt to share such experiences in this issue.

We have developed a new website wherein you can access all the issues of various languages of LEISA India magazine. This website besides being a repository of LEISA articles, photos and videos, also allows you to share your LEISA experience briefly and your valuable feedback. Please see details on page 36 and visit the site.

You may be aware that we are bringing out special translated editions in Hindi, Kannada, Tamil, Telugu and Oriya. Let us know if you or your friends are interested in receiving the language editions. These are meant for non-english speaking readers who are comfortable with the local language.

Many of our readers are contributing voluntarily and we thank them for their support. We would like to inform you that the contributions made to LEISA India are exempted under 80G of Income Tax regulations. Kindly avail this opportunity and donate generously.

The Editors

LEISA is about Low-External-Input and Sustainable Agriculture. It is about the technical and social options open to farmers who seek to improve productivity and income in an ecologically sound way. LEISA is about the optimal use of local resources and natural processes and, if necessary, the safe and efficient use of external inputs. It is about the empowerment of male and female farmers and the communities who seek to build their future on the bases of their own knowledge, skills, values, culture and institutions. LEISA is also about participatory methodologies to strengthen the capacity of farmers and other actors, to improve agriculture and adapt it to changing needs and conditions. LEISA seeks to combine indigenous and scientific knowledge and to influence policy formulation to create a conducive environment for its further development. LEISA is a concept, an approach and a political message.

ILEIA - the Centre for Learning on sustainable agriculture and the secretariat of the global AgriCultures network promotes exchange of information for small-scale farmers in the South through identifying promising technologies involving no or only marginal external inputs, but building on local knowledge and traditional technologies and the involvement of the farmers themselves in development. Information about these technologies is exchanged mainly through Farming Matters magazine (<http://ileia.ileisa.info/>).

Livestock rearing and ecological agriculture

Ratnagiri farmers make their choice

Nitya Sambamurti Ghotge

Young farmers in Ratnagiri are successfully preserving the unique diversity of the region by integrating small scale agriculture with livestock production. Looking beyond short term gains, these young farmers are also spreading the sustainable agricultural practices to many others in the region.

Eco-friendly goat husbandry for sustainable livelihood of small farmers

Narayan G Hegde and Rajendra K Mahuli

Goats are increasingly seen as a threat to the ecology as they feed on any type of plant species. But for the resource poor people, goat keeping continues to be an important livelihood activity. BAIF has promoted a number of initiatives with twin goals of helping small farmers in rearing goats and also protecting the environment.



Unpacking a poultry myth

Mamta Dhawan, Lucy Maarse and Ugo Pica-Ciamarra

Recent evidence from India suggests that rearing indigenous poultry rather than focusing on commercial breeds that give higher yield can significantly contribute to the self sufficiency and cultural wealth of rural communities – as well as boosting their income.

Livestock keepers rights and biocultural protocols

Tools for protecting biodiversity and the livelihoods of the poor

Ilse Köhler-Rollefson, P Vivekanandan and H S Rathore

The development of Livestock Keepers Rights and the Biocultural Protocols will be important tools in supporting the livelihoods of livestock keeping communities and the survival of the biodiversity they have managed over centuries.

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Ilse Köhler-Rollefson, P Vivekanandan and H S Rathore

Livestock for sustainable livelihoods

Keeping livestock is traditional and closely linked to rural culture, indicative of the fact that rural families have always realised the importance of livestock. The central role of livestock in natural resource based livelihood strategies, particularly that of poor women and men in rainfed regions of India is well acknowledged. Rainfed agriculture alone supports 60% of the livestock population. In view of low productivity and high uncertainty in crop production, majority of the people in rainfed regions depend on livestock. It contributes to the livelihood of the poor in many ways – income from products, insurance against drought, emergency cash requirements, household nutrition, fuel for cooking, manure for crops, draught power for farming etc. Evidence shows that smallholders obtain nearly half of their income from livestock.

The smallholders and landless together control over 75% of country's livestock resources. Since the livestock wealth is largely concentrated among the marginal and small landholders in India, it is expected that any growth in the livestock sector would bring prosperity to the small holders. But the trends in the livestock sector provides a different picture altogether. The landless poor are becoming increasingly marginalized (in terms of ownership as well as share in livestock population) with respect to small ruminants, pigs and poultry. There is an increasing exodus of the landless households out of livestock production, mainly because of reduced access to grazing resources, lack of access to non exploitative market and credit and other services. While the landless livestock keepers are dropping out of the livestock sector, the livestock ownership of large landowners is growing at the fastest rate, giving way to emergence of commercial production systems based on high producing animals and external inputs.

For most small scale farmers, for whom it is important to make optimal use of available resources, livestock still has an essential role to play. Factors that smaller livestock such as sheep, goats, rabbits, ducks, chickens and many others have in common, are that they are relatively undemanding in their feeding requirements and easy to house and manage. They are less risky, are easier to replace as they are not so costly and reproduce faster. By optimising the management of the animals as well as the integration of the animals into the farming system, the total production of the farm can increase considerably. The raising of small animals also offers opportunities for a regular cash income throughout the year.

Integrated systems are sustainable

In the conventional agriculture of today, however, the major focus has been on simplifying the production process and on maximizing the yield of the final product, be it grain, meat or milk. In this process, an increasing amount of external inputs have been used to achieve the production goals and research has been focused on

developing animal breeds, which respond well to increased amounts of nutrient rich feed. As a result of this, grain production and livestock production have become increasingly specialized and separated from each other. The grain is grown with inorganic fertilizer and the livestock are fed on this grain. In this way, livestock production has lost its role as a complement and support to agriculture and has become a competitor for grain which could otherwise be consumed by humans.

Agriculture and livestock systems are highly integrated. While livestock becomes a source of organic manure to the crops, the crops and the crop residues are a source of feed to the animals. Experience on the ground shows that production systems which integrate both crops and livestock are highly sustainable. For instance, young farmers in Ratnagiri are making a decent livelihood by combining agriculture with animal rearing (Nitya Ghotge, p.6).

Millions of poor people in the drylands of western India, the Deccan Plateau, and in the mountainous reaches of the Himalayas, depend only on livestock for their livelihoods. These pastoralists depend heavily on the natural resources like forests and common lands for rearing their livestock. Over years through their traditional institutions they have been conserving these bio-reserves by striking a fine balance between animal population and natural resources. But today, the natural bio-reserves remain deteriorated and neglected with increasing state control on the common resources and lack of community involvement. Long drawn struggles over restoring rights on common resources, supported by local NGOs are gaining attention with some interesting results. For instance, KRAPAVIS, a Rajasthan based NGO, has been involving local communities in restoring about 100 Orans, a source of food, fodder, water and fuels to the pastoralists living in the foothills of Aravallis. (Singh and Gupta, p.18).

People's initiatives

There are some limitations and challenges in livestock promotion among poor farmers - inadequate feed and water resources, low productivity and limited availability of health services, and poor management practices, and these need to be addressed. While the mainstream research and extension hardly reach the small farmers, there are some efforts made by the Non-Governmental organizations as well as some specific projects, which can serve as examples to be emulated. All these examples bring out the importance of a participatory process and how peoples initiatives can bring about sustainable solutions.

From being research centric, many institutions are moving towards farmer-centric research and extension. For example, under the Indo-Swiss project, the government of Sikkim involved farmers in a Participatory development Technology process, enabling farmers chose a right feed management option (C K Rao, p.14). Innovative

farmers are also bringing out a number of innovations in feed management. Veerakempanna (p.29) a farmer in Karnataka combines open grazing with stall feeding his sheep and plans to promote fodder pellets in future.

It is being increasingly realized that technological options are not sufficient in bringing about sustainable change. Building social institutions and networks becomes important. The Fodder Innovation Project contends that building networks and putting institutional arrangements in place to enable innovation is a better way of addressing the fodder shortage problem. This is all the more important while dealing with the issues of common resources. Experience of FES shows that investments in institutional arrangements in common property resources can contribute to better access to fodder and water to poor livestock keepers (Rahul Chaturvedi and Sanjay Joshie, p. 26).

Modern production systems depend heavily on a few strains, thus neglecting the local breeds. Local breeds, are well adapted to the environment and to the farmers' management practices. However, to realize the genetic potential of indigenous breeds better quality feed and selective breeding is necessary, but unfortunately research and extension has so far shown little interest. At present, many financial institutions provide incentives and loans for the rearing of exotic or high-yielding crossbreeds, but do not provide similar assistance for indigenous stocks. Encouraging the propagation of native breeds will progressively increase their sustainability and they will be automatically conserved. Progressive improvement in the production potential over a period of time is an in-built security for the survival of breeds. The women livestock keepers in South India, find improvement of local breeds a better option to the exotic breeds of livestock. For them, rearing of local breeds is hassle free, add-on and a part time activity requiring low investment and giving higher returns. Moreover, these local breeds are hardy and have high prolificacy.

Livestock and climate change

The concerns over environmental effects of livestock production in India are of relatively recent origin. On one hand there is a concern that changing climatic conditions will severely affect the livelihoods which are based on natural resources like agriculture and animal husbandry. Promotion of sustainable agriculture and livestock rearing will be vital to ensure that the impact of climate change is minimized on the communities. This will involve rearing of animals which are more sturdy, heat tolerant, disease resistant, and relatively adaptable to the adverse conditions. In such a situation some of the indigenous breeds will be able to cope much better than the cross breeds.

On the other hand, livestock is being seen as one of the culprits of environmental degradation. Large ruminants are being accused of releasing large quantities of methane emissions, NATCOM (India's National Communication to UNFCCC on Climate Change) has estimated that out of the total quantity of methane produced in India, emission by livestock due to enteric fermentation is the highest (49% - 188 million tons CO₂-eq). Small ruminants like goats are increasingly being seen as a threat to the environment.

Environmentalists are of the opinion that goat has an aggressive grazing habit which causes severe damage to vegetation and accelerates desertification. But small ruminants can improve soil and vegetation cover as well as help in dispersing seeds through their hooves and manure. Although blamed for negatively impacting environment, livestock will continue to remain as a livelihood option for the majority of the poor in India. The solution lies in promoting adequate measures to ensure sustainable development without causing damage to the environment.

Need for new policy paradigm

Since landless, small and marginal farmers are dependent on common property resources often they get negatively impacted by policies of forest department. In the absence of pro-poor policies, these common property resources are under severe degradation and are subjected to encroachment and conversion into national parks and sanctuaries etc. The Convention on Biological Diversity recognizes that the local communities are the real custodians of biological diversity and have vital stakes in conservation. They should thus be involved fully in conservation programs. Farming communities should also share the benefits from sustainable utilization. The development of Livestock Keepers Rights and Bio Protocols will be important tools for preserving the biodiversity they have managed over centuries (p.35).

Livestock are not merely production instruments. We need to see livestock in the context of livelihoods of the poor and their vulnerability. Hence there is a need to have a holistic view and a collaborative effort to have a pro-poor, pro-environment development, which will produce an inclusive and sustainable growth.

This issue of the magazine brings out small examples where collaborative efforts and people-centric processes have created a good impact on livelihoods. Efforts of such nature should continue in a big way in the years to come.

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Livestock rearing and ecological agriculture

Ratnagiri farmers make their choice

Nitya Sambamurti Ghotge

Young farmers in Ratnagiri are successfully preserving the unique diversity of the region by integrating small scale agriculture with livestock production. Looking beyond short term gains, these young farmers are also spreading the sustainable agricultural practices to many others in the region.



Tucked away in the folds of the Sahyadris lies the Vilye watershed. The Watershed development programme initiated in the 1980's – one of the first of its kind in the region – transformed 6 villages of the watershed in more ways than one. First of all, it ensured there was water available 12 months of the year; small check dams renewed land and soil, plantations of trees ensured that forests laid bare by the charcoal trade were green once again. Next, it ushered in a cash economy. Everybody began planting mango and cashew. To protect the young plantations and nurseries, local goats were killed or driven away, and the local patterns of agriculture and livestock rearing were disturbed forever.

Development and progress are often measured in economic terms alone. The social and environmental effects of different development programmes take a while to manifest themselves. Sometimes, difficult choices have to be made, where the short term economic advantage may have to be foregone to retain a long term social and environmental goal. This is the story of how a group of young people from the region, associated with ANTHRA have tried to retain the uniqueness of the region with small scale agriculture and livestock production without being drawn into the vortex of global change.

The Vilye watershed was a well known watershed in the region. When water became available in the 1990's in the Konkan, many people in the region nurtured ambitions of running a successful dairy programme. In fact, one of the local ministers even managed to sanction a sizeable amount of money for starting the dairy. Unfortunately, none of the villagers were ready to take up the initiative. The reasons were simple. Most of the able bodied men were away in Mumbai working and the major burden of crop farming was on the women. With the increased work burden, they had even given up planting certain varieties of pulses and cereals as it was easier to buy these with the money orders their men sent home. Dairy animals meant more care, more fodder, more water, more work and the women were reluctant to take on more than they could realistically manage. The dairy programme was quietly withdrawn.

Building local human resources

Around the same time, about 10 young people from the region were trained by ANTHRA as animal health workers. ANTHRA's training laid emphasis on local breeds and species, locally available fodder and importantly, locally available herbal medicines. As these young animal health workers documented and validated their local systems of agriculture and livestock production their own confidence in their own knowledge and systems grew. It brought a new approach to farming where these young people wanted to look beyond short term economic gains. The village community though was slow and reluctant to accept what these young people had to say.

It took multiple incidences of fowl pox and salmonellosis which decimated the poultry population for the village community to see the value of having an animal health worker in the village. The AHW's responded to the disaster with herbal medicines and prophylactic vaccination programmes the next season. They also helped mobilize the local veterinary department to administer the necessary vaccinations for large animals. They answered calls when animals were sick, they shared knowledge of the herbal medicines they knew, for more serious conditions they asked for help from the veterinary community. As the mortality morbidity of the animals decreased the communities confidence in these animal health workers grew.

However, it was soon apparent that the extent of development in livestock in the region was limited. Dairying as an economic activity was not possible because of an acute scarcity of quality fodder. The goats had disappeared with the watershed development programme and communities were reluctant to bring them back. Only back yard poultry seemed suitable and acceptable to the region and the animal health workers had done all they could do to keep the birds healthy. They were vaccinated on time, fed and watered properly, given immediate care when they fell sick.

Agriculture, first

The animal health workers were keen to explore other issues related to agriculture. Mangoes, especially alphonso mangoes are a cash crop from the region and farmers, even small peasants, began planting mango trees to supplement household incomes. To ensure good returns, farmers began spraying chemicals in the form of hormones and pesticides to protect the fruit. Unaware of the side effects of these chemicals, large scale spraying would begin in the month of December and the area would be covered in a thick chemical haze, as village after village, spraying was done.

The animal health workers by now convinced of the validity of herbal medicines for animals were keen to experiment with herbal medicines on crop varieties. A set of small trials were run one winter using different combinations and there was a great deal of success. Locally available herbs like *Vitex negundo*, *Ocimum sanctum* and *Leucas stelligera* were combined in different proportions and combinations along with cow urine were formed as effective as chemical sprays and definitely less toxic. Spurred by the success, the AHW's began regularly preparing and bottling these bio pesticides for use and sale in the region. They faced a considerable amount of competition though from company representatives who supply pesticides to the farmers.

As the group looked for new ways to enhance their agriculture production vermi composting appeared as a suitable intervention and pilot vermi composting units were started. Initially a vermicompost unit was started in the small bio diversity park run by ANTHRA in village Tarwal of Ratnagiri district in the year 2002 under the Small Grants Programme of the GEF project. The unit did well because the group understood very soon that earth worms need to be cared for like any other animal. Soon the programme began to spread to other villages in the area. In 2005 - 2006 the group was contacted by the local unit of the *Jal Swaraj* scheme and they began training farming groups on vermicomposting and back yard poultry rearing in over 40 villages of the district.

Reviving local foods

In 2005, a team of students from IIM Ahmedabad visiting the area conducted a small exercise on food and fodder security in the region through a small audit. It was found that while the village exported vast quantities of mangoes and cashews, the income did not necessarily result in enhanced nutrition for the average small farmer. Amongst others, fresh vegetables emerged as a major deficiency in the local nutrition system as people had given up cultivating local varieties of greens. Households were depending on vegetable imports from Belgaum and Kolhapur. Not only were they expensive but also poor in quality owing to travelling long distance.

Reviving local food varieties and increasing local production became the new challenge within which procuring local seeds emerged as a major challenge. Again, private companies with colourful packaged seeds had won. Farmers find it easier to buy a packet of seeds from a shop as opposed to storing their own seed for the next cropping season. The animal health workers began a

process of systematic collection of local seeds of different varieties as well as documenting local methods of storing seed.

Integrating farming and livestock systems

To increase production of rice, the local staple, different methods were evaluated. The SRI method was already being popularized by NGO's in other parts of the country. A modified version, more popularly known as the Japanese method locally was already being practiced by a few farmers. SRI methods though required careful inputs into the soil in terms of fertilizer. The group went on to learn other composting methods as well as the preparation of organic growth promoters such as panchagavya and starter solution which used products from livestock especially cow urine and dung. Experiments were also conducted with goat urine and buffalo urine to see if the effects were similar. The critical importance of livestock to agriculture emerged. There was a huge shortage of animal manure in the area as people had sold their livestock especially local cattle. In those pocket sized rice fields local bullocks for traction and animal manure cannot be substituted with chemicals and machines.

Slowly, the process of reintegrating livestock and agricultural systems in the region took place with careful use of locally available seeds and crops, livestock and livestock products as well as medicinal plants and herbs. Careful documentation as written records and as short films has also taken place. A small degree of traditional local food processing is also in progress. Dried kokum, kokum sherbet, karvanda pickle, herbs, spices and cashew nuts are some of the products. An annual cookery competition where only local foods can be served reinforced the need to celebrate local diversity.

Moving ahead

Today the team of Animal health workers is in the process of registering their own cooperative in the Ratnagiri region. Fifteen members have come together so far pledging to pursue ecological agriculture on their farms. This cooperative will decide what they want to grow and how they will grow the crops on their land. One of the key objectives within the cooperative is to experiment with ideas and also to share this knowledge with others in the region. The group is conscious that the area is unique in its biodiversity and natural beauty and these hold promise for the future.

The challenges continue. Every now and then disasters like the cyclone Phyan, floods or just delayed rains hit the crops. A proposed nuclear power plant and a thermal power plant threaten to destroy the mango and cashew plantations. The energy demands of a larger nation state ride over the dreams of small groups of farmers. However, thanks to the diversity of knowledge and systems, the community is ready for them.

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Women livestock keepers of South India prefer local to global breeds

Ilse Köhler-Rollefson and
Karthikeya Sivasenapathy

For most women in South India, rearing local breeds is hassle free, add-on and a part-time activity that can be combined with other income generating activities. Authors through a number of cases, highlight merits that these women see in local breeds like – low investment in terms of housing and feed, prolificacy and hardiness.



About 400 million, or two thirds, of the estimated 600 million poor livestock keepers in the world are women (Thornton et al, 2002). It is therefore not surprising that there are numerous studies about women and livestock, and that many institutions, such as IFAD and Heifer have a gender-approach to livestock development. Curiously, the vast majority of reports about women, livestock and poverty alleviation do not specify the breeds of goats, sheep, cattle and other livestock species that are involved. Certainly, in many cases, so called “improved” (*i.e.* exotic or crossbred) with their supposed higher output are promoted.

However, in India’s southern states of Tamil Nadu and Kerala, there are many success stories of women livestock keepers raising local breeds.

Making Do with Mecheri Sheep

For widowed Palaniammal (60) in Veerasolapuram village in Tiruppur district, Tamil Nadu , her flock of 13 Mecheri sheep is her sole source of income. The Mecheri is a hair sheep famous for its very high quality skins. It is perfectly adapted to the local pasture system of Korangadu, which is privately owned sylvipasture system enclosed by a live fence. The most important

Mecheri sheep are adaptable to the local pasture systems.





Malabari goats, a means of building assets.

vegetation are *Acacia leucophloea*, *Cenchrus setigerus* and *Cenchrus ciliaris* and wild legumes and grasses. The Mecheri ewe gives birth to about 1.5 lambs per year or one lamb in 8 months. [Mecheri ewes average has three lambings in two years and single lambs are the norm]

Palaniammal embarked on her sheep production venture, some ten years ago, thanks to a government scheme that enabled her to obtain 10 ewes and a ram for Rs. 15,000 on 50% loan and 50% subsidy basis. To feed her flock, she is leasing 7 acres of Korangadu pasture from a Gounder landlady for Rs. 5,000 per year. This nets her an annual profit of about Rs. 5000 from the sale of lambs. Marketing of manure fetches an additional Rs. 1200. With these returns she was able to repay her loan within 7 years.

Palaniammal's work is hard – she has to walk about 3 km every day bringing water from the pump to the pastureland. And due to the current drought, she has to purchase additional feed – bajra stover– to maintain the sheep. But veterinary inputs are free, enabling her to deworm regularly. Palaniammal is neither complaining about her lot, nor worried about her future. She is proud that she can buy gifts for her two married daughters and grandchildren when they come to visit, and in fact she was able to support one of her daughters with cash by selling a good number of sheep- in between her flock had risen to 40 head- but she sold a large number to provide cash to support one of her daughters. When Palaniammal will be too old to take care of the sheep, she will sell them, give the money to a reliable person and live off the interest.

Keeping Kangayam stud bulls

The Kangayam cattle is a famous draft breed of western Tamil Nadu and forms an integral element of the Korangadu pasture. Earlier this sturdy breed was essential for lifting water, ploughing, hauling the harvest and rural transportation in general. A number of factors, including irrigation, availability of electrical and diesel pumps, as well as a rise in property prices, have resulted in a dramatic reduction of the population.



Kangayam stud bulls are being used for breeding.

Nevertheless Sundaram Ramaswami and his wife Soundra of Mulanur village have specialized in keeping Kangayam stud bulls for breeding. Their four bulls serve an average of six cows per day for a fee of Rs. 150 per service. Interestingly, the majority of the cows they service are Holstein-Friesian grades that have difficulties in conceiving via artificial insemination. Soundra not only had the idea of keeping stud bulls, but is also the one handling the bulls, supplying them with water and keeping records of the services. According to her husband, she is the only one to whom the old bull in the picture listens to. The couple and the bull have a sentimental relationship: he starts shedding tears when he is shouted at and although he is at an age when other bulls are retired, his owners want him to die a natural death and plan to give him a proper burial.

Binu and her goats

The Malabari goat is the first breed to be recognized in Kerala and takes its name from the hot and humid Malabari coast that is famous for the cultivation of spices. It is a vigorous and prolific breed that produces both milk and meat. Scientific studies have shown it to be superior to imported Boer animals and Boer crosses; yet the latter continues to be promoted by the Government. Binu, a poor mother from Athirampuzha in Kottayam is benefiting from this breed. She keeps just one Malabari doe, but this animal has produced strong and healthy quadruplets three months ago which will be ready for sale in about one month. Because of the booming demand for meat, a four month old female fetches Rs. 1500, while males are sold for Rs. 2500. Mother and offspring are sustained almost exclusively on free forage that Binu collects from roadsides and plantations. Even the goat shed is constructed completely from throw-aways and without any financial investment. Binu will use the income to build assets for her children by buying gold for them, and undertaking some repairs on her house.

For Binu who covers her daily expenditures by going for casual labour, the Malabari goat is a means of building assets and a pleasant, no-risk means of generating income.

Shirley and Ankamali pigs

Although the Kerala government is promoting exotic white pigs, it is the local black Ankamali pig breed that is better suited for income generation for resource poor farmers. Its advantages are its small size (only 20 kg slaughter weight), ability to thrive on local feed, disease resistance, heat tolerance and uncomplicated reproduction.

Shirley is a single mother raising two daughters in Onamthuruthu in Kottayam District of Kerala. She keeps two sows and one boar of the Ankamali pig breed, sustaining them on kitchen waste, leaf fodder, and weeds. Recently, she sold 27 piglets at the age of 45 days, each for Rs. 1000. She also keeps a few goats and is hoping to add a Vechur cow.

Vechur cattle

The Vechur cattle is only about 90cm high and originated in the coco-nut groves of coastal South Kerala. Due to the heavy-handed promotion of cross-breeding, it would have become extinct, but for the efforts of Prof. Sosamma Iype and a few of her students (later transformed as the Vechur Conservation Trust) who scouted out and collected the handful of remaining pure animals and now have brought the population back to about 1500 head. The small cow is now proving extremely attractive for people who are keen on zero-budget or low-input farming, since it can be kept in a small area and sustained on crop waste and weeds. It is also popular as a companion animal and to provide milk for households with small children. There is now a long waiting-list for this animal at the Vechur farm in Moozhikulangara, near Vechur village in Kottayam District.

Conclusions

Local breeds seem to have many advantages over the improved varieties that are generally promoted. Among these are the disease resistance and prolificacy and their error friendliness. These animals require low investment, if any, in terms of housing and purchase of fodder and feed. In fact most inputs are available free. For this reason, raising local breeds for most women is a rather hassle-free add-on and part-time activity that can be combined with other income generating activities, and reliably leads to good economic returns.

By comparison, improved varieties of livestock may have higher outputs (at least in theory), but require housing to protect them from the climate, regular disease prophylaxis, as well as purchased concentrate feed. Often, there are problems with fertility in the long run, and the yields may not be as high as expected. For instance, in Kerala, after half a century of cross-breeding, the average daily milk yield of cross-breeds stands only at about 6.5 kg. The number of these animals is going down and some local dairy farmers have even stopped breeding, preferring to purchase pregnant animals that they sell for slaughter after their lactation period is completed. Generally, nobody stays in dairying for more than 10 years, according to Dr. Sosamma Iype, a retired professor of animal genetics and head of the Vechur Conservation Trust.



Vechur cattle ideal for low input farming.

Despite the obvious benefits of the local breeds and the drawbacks of the cross-breeds, credit institutions, such as NABARD and others, give loans only for the latter, and cross-breeds are relentlessly promoted by the animal husbandry departments. It is time for a paradigm change!

Acknowledgments

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Re-assessing the fodder problem

Mona Dhamankar

Maintaining the availability of adequate feed for livestock is crucial to small holders who depend on their animals for their livelihood. Traditionally, efforts to improve the quality and availability of fodder have focused on technology, but the Fodder Innovation Project is revealing that strengthening interactions among the various actors involved brings even better results.



Fodder makes up 70 percent of livestock inputs and is crucial to the livelihood of poor livestock-keepers in most developing countries. However, several factors continue to threaten its supply. Most livestock-keepers depend on agricultural crop residues and grass provided by the grazing of common or fallow land supplemented by cultivated grasses. But most crops are rain-fed and can't be relied on. In addition, shifts in crop type and variety tend to reduce the availability of feed, as does encroachment from other land uses. Over-grazing often leads to the degradation of grazing ground, and to make matters worse, a consistent push to develop crossbred animals that are more productive but input intensive, has accelerated the problem.

Shifts in perspective

The traditional solution to these challenges has always been to promote the cultivation of fodder that is nutritionally beneficial, thus, increasing yields. Governments have supported this approach by stimulating the use of high-quality seed varieties and developing new technologies. While this might work for large-scale operators, small-scale and landless farmers don't have the resources to take these new technologies on board. Fortunately, the International Livestock Research Institute (ILRI) decided to look at the issue from their point of view and discovered that the problems related to fodder availability have just as much to do with access to

“Small-scale farmers don't always have the resources to take new technologies on board”



Photo: SAPPLP

Forests of fodder

In the Indian village of Wankute, in the area covered by one of the project's participating organisations, the Watershed Organization Trust (WOTR), the grass *Stylosanthes hamata* was identified as suitable for cultivation on community lands as fodder. Representatives from WOTR, the Department of Forestry, Mahatma Phule Agriculture University, the village development committee and the Joint Forest Management Committee (JFM) divided up tasks that included providing the seed and passing on information on its features. The Forest Department worked alongside JFM to create a mechanism that would give farmers access to forest lands for fodder production. Landless farmers would have first access to the forages from the forest, followed by those who did not own enough land for fodder cultivation. It was exceptional for the Forest Department to take an interest in fodder issues and to allow farmers access to forest land for reseeded.

knowledge as with access to appropriate technology. As a result, the UK Department for International Development (DFID) funded a project that was implemented in India and Nigeria. Under the banner title of the Fodder Innovation Project (FIP) its findings keenly illustrate this shift in understanding.

Field-based trials in India and Nigeria

The first phase of the project, which kicked off in 2003, identified new varieties of fodder and dual-purpose food/feed crops, passing on information to its partners (government research organisations and NGOs) with a view to increasing production. Each partner organisation implemented the project within some general parameters, but according to its own mandate and the context in which it worked. In both India and Nigeria it became apparent that issues related to seed production, supply and low survival of the plantations must be addressed before appropriate technologies could be employed. It also showed that while participatory research is useful, innovations need to be introduced in the institutional and policy arenas too. The effective development of technology demands concurrent investment in new local networks; programmes, processes and policies must all be open to innovation.

Enabling effective innovation

The second phase of the project, which got underway in 2006, centred on how best to realise this call for innovation. Five partner organisations were identified through countrywide landscaping exercises in India and Nigeria and became the project's Key Partner Organisations*. They included governmental, semigovernmental and non-governmental organisations and were all running livestock-related programmes. To facilitate the process it was decided to select a context-specific innovation theme for each location. For example, one NGO in India, the Foundation for Ecological Security focussed on increasing the marketable surplus of milk on select routes, while a Nigerian NGO, the Justice, Development and Peace Commission looked at raising goat-rearing from its largely subsistence status to a semi-commercial level (see box on this page). What came out of these joint endeavours was that if interactions between the wide range of organisations that have knowledge relating to fodder and livestock were strengthened,

this would lead to the institutional and policy changes necessary to improving the way information is created, distributed, shared and used.

Providing pauses for reflection

The networks that were put in place all included representatives from public, private and civil-society organisations, and the livestock-keepers themselves. Joint action plans had different entry point activities such as seeding forests with fodder strains (see box on previous page) and organising animal vaccination camps. Periodic reviews, followed by mentoring and reflection on the network processes by all members proved to be important components of the project. Studies were carried out to find out

Scaling up goat-rearing in Ikire

In the Ikire area of southern Nigeria, farmers kept goats mostly as a saving and/or insurance against crises. While rearing goats at a subsistence level, fodder was a non-issue. They were mostly being managed by women alongside their domestic chores who preferred to let them browse freely on available feeding resources, irrespective of the season. Traditionally, goat farmers do not access markets directly – they depend upon middlemen (who work independently within pre-determined boundaries) who tend to be exploitative. In discussions with farmers, it was found that the farmers recognise the potential of goat rearing as a supplementary livelihood option, as a chance to make extra money during festivals. However, as the right network was not in place, they never took scaling up of the activity seriously. Continued discussions revealed that farmers who were keen to move from subsistence to more systematic rearing of goats (on a commercial scale) would require not only an assured, adequate and year-round supply of the right kind of fodder, but would also have to confine their animals, and build appropriate networks. In turn, each of these factors would require a combination of technology-related and institutional interventions to be carried out by relevant individuals and/or organisations.

The Fodder Innovation Project – the story so far

The innovation-focused approach of the Fodder Innovation Project led to some very interesting results. These are some of the outcomes:

- In India, village dairy co-operatives that had gone out of business were revived when surplus milk became available. Some farmers collaborated with these co-operatives for fodder supply and payment recovery.
- New and unusual partnerships emerged in both India and Nigeria. In Ikire, Nigeria, representatives of the Goat Sellers Association gave tips on feeding and rearing to goat farmers. The Justice Development and Peace Commission collaborated with the Nigerian Veterinary Research Institute to provide training to local service-providers and vaccination services to goat farmers.
- Community-based organisations took the initiative of organising health camps in collaboration with the government to extend vaccination coverage.
- A demand emerged for research into improved goat breeds suitable for Southern Nigeria – an example of farmers helping to set research agenda.
- Closer and more efficient networks were set up in Rogo, Nigeria.
- In India, new fodder production initiatives emerged, bringing together governmental departments and academics.
- New responsibilities were shouldered at the level of policy-making, from organising trainings to liaising and co-ordinating on many fodder related issues.
- India's Foundation for Ecological Security was so impressed with the project results that it extended the use of networking and the creation of multi-stakeholder platforms to all its other programmes.
- On learning of the project, India's Planning Commission invited a representative to take part in national livestock planning discussions.

how best to link the research to the policy-makers and the organisations involved, and a Fodder Innovation Policy Working Group was created at national level in both countries to facilitate this. These Working Groups comprised senior government representatives from the departments of animal husbandry, dairy and rural development; heads of NGOs; managing directors of co-operative milk unions, and scientists from agriculture and fodder research organisations.

The way forward

The FIP contends that building networks and putting institutional arrangements in place to enable innovation is a better way of addressing the fodder shortage problem along with the conventional

Systematic rearing of goats requires a year round supply of fodder.

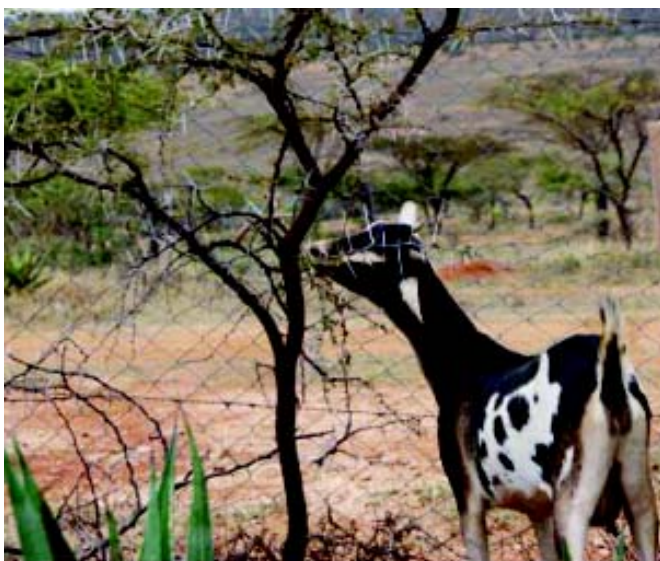


Photo: Jonathan Davies

technology transfer approach. A socio-economic baseline survey was conducted at the beginning of the project; the repeat survey to assess impact is yet to be carried out. While it's too early to say if the innovation approach goes far enough to solving the problem, the project has shown those involved how to build and nurture networking processes that benefit livestock-dependent farmers. It also showed that the constraint is not limited to the availability of fodder, but it has to be put into context with other issues at the level of crop-livestock value chains, like markets or access to services.

Learning laboratories

As an action research project, the Fodder Innovation Project was successful in setting up networks and turning them into effective learning laboratories, but further improvements can still be made. Innovation platforms could be created around crop-livestock value chains and strategies put in place to ensure that innovations are pro-women and pro-poor. The lessons must be sustained and expanded before they have currency in policy debates, but the fact that an apex organisation like India's National Dairy Development Board agreed to host the Fodder Innovation Policy Working Group is encouraging. The shift in perspective from a technology-driven to an innovation-focused approach is well underway, but we need to gather more evidence before policy-makers take it on board wholeheartedly.

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Farmer trials on feed management

C K Rao

Farmers are trying out different options to improve the feed management in dairy animals. They are looking at options which reduce costs and at the same time do not affect the milk yields. The participatory technology development process provided a farmer centered extension mechanism, enabling knowledge enrichment, for farmers as well as for researchers.

Sikkim is one of the northeastern states situated in the eastern Himalayan range. Around 77 percent of the rural households draw their principal income from livestock. The geographic location with extensive terrains makes Sikkim less conducive for extensive agriculture. On the other hand, it renders enormous scope to improve livestock production to support rural livelihood.

Indo Swiss Project Sikkim, a bilateral collaboration between Government of India and Government of Switzerland initiated a project in the region. The main goal of the project was to improve livelihood of small and marginal farmer house holds in rural Sikkim through efficient and sustainable use of natural resources and promoting concepts of self-governance and empowerment. The project focused on building on farmers knowledge while integrating new knowledge from the research and mainstream institutions. Participatory Technology Development (PTD), a process which enables this was adopted.

PTD Process

A series of discussions were held with Animal Husbandry Department resulting in developing a PTD concept and related facilitations. Consequently, a PTD facilitation group was carved out at the interface with the farmers, at the same time district level and state level management committees were formed to support implementation of PTD concepts. Simultaneously, a technical support group was also carved out involving subject matter experts from department and ICAR. For further value addition to and bringing new dimensions in the PTD process, a Multi Stake Holders' Platform (MSHP) was also formulated involving subject matter experts from IVRI, experienced livestock experts and livestock extensionists from the field and the Civil Societies.

A series of exploratory PRAs were conducted in 10 villages of which five were selected as implementation sites. Acute fodder shortage especially in winter season when most of the lactating cows are in the middle lactation was recorded as the most pertinent issue. The other issues ranged from knowledge & skill gaps in feeding management, high cost of concentrate feeds and of course low quality of animals. The

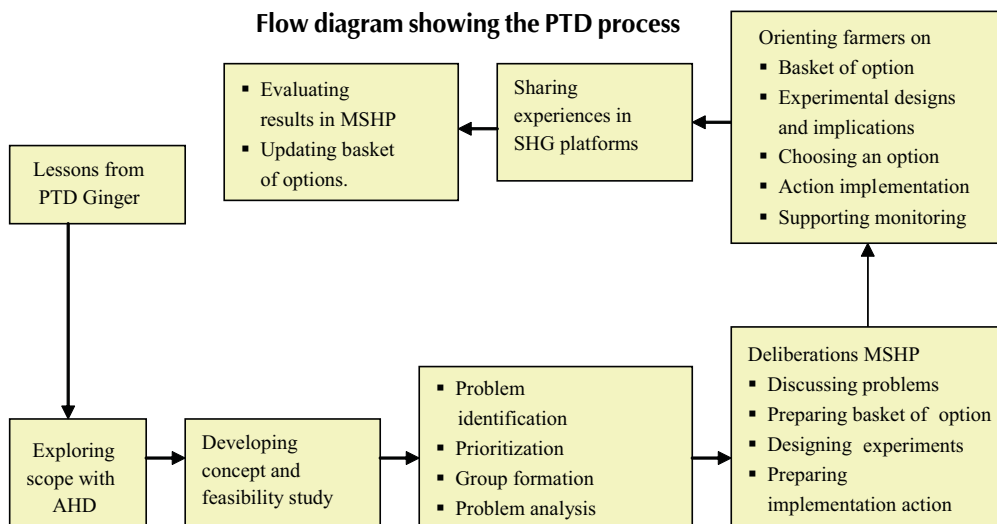
PTD is a process that combines farmers knowledge and those of extension functionaries and scientists together to try out things that work at farmers level and which can be replicable. The PTD platform is a miniature learning organization generating and promoting innovative technologies. In the entire approach farmers work in groups, share experiences and evolve new practices.

predominant practice of feeding livestock is based on a cut and carry system of green fodder and concentrates. In these five villages, farmers having common interest in addressing the problems formed into self-help groups (SHG). The department and project facilitated these SHGs.

The problems were discussed in Multi Stakeholder Platforms (MSHP) to identify the basket of options to address the issues. The MSHP comprised of members of SHGs, technical support group, PTD facilitation group and invited scientists and Subject matter experts. The MSHP developed suitable experimental designs and implementation action plan. The PTD facilitation group counseled the SHGs to choose appropriate options for implementation.

The project supported SHGs with certain grants so that the SHGs could lend this money to individual farmers, for arranging inputs. In the whole process, a mutually agreed role and responsibilities of different actors involved in the process were well drafted. The

Flow diagram showing the PTD process



SHGs carried out the experiments with the support of PTD facilitation group and shared their experience at different intervals. The SHGs developed data sheets and recorded the data as per the experimental design. Members of the SHG shared their experiences periodically. Farmers from SHG presented their experience in MSHP for open discussions during February 2006.

PTD on feed management

Dairy livestock was chosen for the PTD trials. The PRA results have revealed that during winter season when most of the milk producing cattle were supposed to be in middle stage of lactation (a sustainable milk production zone), there is an acute shortage of fodder, which forced the farmers to feed more concentrates to sustain milk production and continue income generation. Since nutrition management influences the cost of milk production, the issue of fodder management was chosen by the community on a priority basis.

Two options were tried out. Optimizing utilization of available green fodder by minimizing wastage of available green fodder was chosen as an option. Feeding chaffed green fodder was promoted as an intervention. Simple hand made chaff cutters were designed and kept at the disposal of each farmer.

For improving the concentrate feed efficiency, Effective Micro Organism (EM) treatment was taken up as a second intervention. To minimize the quantity of concentrates feed to milch cows, a simple fermentation technology using EM was tried out. Trials on treating concentrates with EM liquid and feeding to animals are still going on. This paper deals with the first trial only.

Conducting trials

Lactating cross bred jersey cows belonging to the SHGs were categorized as early lactating group (group 1), mid lactating group (group 2) and late lactating group (group 3). Each group comprised of ten cows. Base line information was collected with respect to quantities of green fodder and concentrates fed to the animals. The concurrent quantities in milk production, their fat and SNF yields were also recorded.

Trials were spread over 6 weeks (45 days) from the 16th day following the initial base line recording date. From the sixteenth day, all the crossbred cows in each of the groups under this experiment were fed with chaffed fodder replacing the earlier practice of feeding green fodder as it is. Chaffed fodder was placed in small indigenous baskets/containers, which improved hygiene of the cowsheds while preventing wastages.

The fodder wastage was estimated. Milk yield was recorded (litres) on daily basis while fat and SNF percentages were estimated once every weekend.

Gains from PTD

The gains from the PTD process were several. Farmers could save time from collecting green fodder as she/he is in a position now to rationalize green fodder feeding. Moreover, there was a substantial financial gain owing to cut and carry method. The grass cut and carried, which was earlier sufficient for two animals is now

considered adequate for three animals. Chaffing reduced the wastage thereby improving per animal intake. The same quantity of fodder, which was earlier used for two cows, is able to cater to the needs of three cows. Using EM liquid has enhanced daily milk output by nearly 0.13 kilos and fat yield by 0.41%.

Feeding Chaffed fodder has considerably reduced green fodder wastage while the base line animals received 37 kilo green grass during experimental period similar quantity of chaffed fodder helped farmers on cutting down the costs of nearly one kilo concentrates. The reduction in milk yield from 3.61 to 2.75 liters is incidental to the fact that these animals were approaching dry periods. Feeding chaff to animals indirectly helped farmers to improve the hygiene of the sheds, which has further reduced the incidence of mastitis and tick & fly infestations in the cattle sheds.

Though specific calculations are not available, saving one-man day a week on fetching fodder is a major outcome observed through farmers' presentations in the multi stakeholders workshops.

The experimental protocol prompted farmers to think analytically and farmers' decision-making has improved.

Farmers have developed informal village level platforms for sharing experience. Village level platforms are potential grounds for Farmer-to-Farmer Interactive Extension (FARINEX). Farmers developed access to financial institutions and technical personnel for relevant support. Village level stakeholders workshops have formed as a prelude to citizens' charters. Now, farmers are aware of different livestock services available to augment their economy. Though not substantial, farmers had quick access to credit through SHG platforms. The process of micro credit and savings were well appreciated by the SHG members. Farmers have developed sense of self-esteem.

Way forward

It is the beginning of a beginning. The direct and indirect financial gains appear to be marginal. Although meagre, it is substantial in the context of poor livestock holders. Maintaining status of existing milk production while cutting down costs on concentrates and economizing on time and quantities of green fodder used for feeding animals is well appreciated by the farmers. More importantly, village level farmers centered extension mechanisms has enhanced the scope for technology based functional literacy; both at farming and at the research level. ■

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Mitigating global warming while providing sustainable livelihoods

Narayan G Hegde

Animal husbandry is an important and integral part of agriculture, which has been under severe neglect and totally disconnected from the agricultural sector. The livestock sector is characterized by low production, poor contribution to rural economy and suppression of livelihood of small farmers. India hosts over 17% of the world's livestock but their performance is only to the extent of 25-30% of their counterparts in developed countries. With the growing livestock population, without any serious effort for genetic improvement and increasing fodder production, there has been a severe shortage of feed and fodder resources which have been affecting their productivity further.

Livestock is being considered as a threat to eco-system and environment in many developed countries. Climate change will further impose new challenges and uncertainties. India stands third among the highest releasers of carbon dioxide in the atmosphere

because of large population. India has also been contributing substantial quantity of methane, another green house gas which is released from livestock and their dung. Methane poses a more serious threat compared to carbon dioxide as it can absorb 23 times more heat. Therefore, emission of methane can be a serious concern as India owns the largest livestock population in the world. However, for over 75% of the small farmers in India, livestock is an important source of income for livelihood. For these farmers, immediate food security from livestock is the primary concern, inspite of their ill-effects on the environment.

Over the years, cattle have made a significant contribution to rural economy in the form of nutritious milk, bullock power and manure. In the absence of adequate technical services for genetic improvement, timely health care and feeding of balanced ration, the productivity of cattle and buffalo has decreased significantly over the years. Thus, the small farmers have developed a tendency

Goats provide livelihoods to millions of small farmers.



Photo: S Jayaraj

to increase their herd size to generate additional income, which has been increasing the pressure on the supply of fodder and feed resources.

BAIF's experience has shown that Dairy husbandry can generate gainful self employment even for landless and women-headed families, who could purchase crop residues and fodder from other farmers. Substantial income from crossbred cows, has weaned them from working for wages. This way, genetic improvement of cattle as well as buffaloes helped small farmers to come out of poverty, keeping a small number of animals, while significantly contributing to environmental conservation and reduction of global warming. This programme today is spread over 55,000 villages in 12 states benefitting over 3 million BPL families. With an annual budget of Rs.30 crores, the BAIF Programme is able to promote production of milk worth Rs.2500 crores (USD520 million) per annum through small farmers. Upgradation of local non-descript cattle through crossbreeding has now been adopted by most of the State Governments in the country placing India on the top slot in milk production in the world. Similarly goat rearing which is considered as a threat to the ecosystem could be handled carefully to help small farmers make a living. BAIF's experience in Rajasthan, Gujarat, West Bengal and Gujarat has proved that goat rearing could be promoted among small farmers without being harmful to the environment.

Scope for Reducing Green House Gases

Further efforts can be made to reduce emission of greenhouse gases by livestock by promoting special programmes in the sector. These include reduction of livestock population, reduction in methane production by livestock and recycling of methane generated to meet the energy needs.

Reduction of unproductive livestock should be taken seriously as they are draining our precious feed resources which are in short supply, while exerting pressure on biodiversity and environment. Awareness need to be generated among farmers about the opportunity losses by keeping low yielding animals. This is a serious problem in cattle as farmers are unable to dispose off their unproductive cattle, both female and male. While cows can be used at least for producing crossbreeds, managing bullocks is becoming a major problem, as tractors and power tillers have replaced bullock in the farming sector, turning bullocks uneconomical even for small holders. Therefore, a serious review of the livestock policy should be taken to deal with conservation of a large number of native draft breeds, their economics and utility for our farmers.

It is necessary to explore economic use of bullock power as an alternate source of energy, by designing new bullock-powered machines and tools. Development of single bullock drawn implements, water pumping system and power generation device for lighting houses may turn these bullocks economical.

The other area for mitigating global warming in livestock sector is by reducing methane emission in the atmosphere. Livestock produce methane while digesting various types of feed. Studies have confirmed that some of the feeds rich in fibre content

accelerate methane emission. Thus, further techniques should be developed to process fibrous feed to break down lignin before feeding to livestock for reducing methane generation. There are techniques to degenerate fibre through physical, biochemical and microbial processes which can probably be perfected and popularised among dairy farmers.

Capturing methane gas from cattle sheds before escaping into the atmosphere can also be explored! Methane released from dung can be easily prevented by generation of biogas, by every livestock owner. Presently, this aspect has been almost neglected, inspite of shortage of other sources of energy for domestic cooking and lighting. Major reasons for poor popularity of biogas plants, which have been promoted by Khadi and Village Industries and various Ministries ever since our independence are poor design of the plant needing large space, high capital cost, poor post installation services and attractive subsidy offered for other fuels such as kerosene, electricity and biomass. Further R and D efforts are needed to develop compact biogas plants which can be installed even on roof top and operated by using biodegradable domestic wastes as well with dung.

Production of fodder to meet shortage of feed should also be taken up on priority, to produce superior quality, easily digestible fodder, instead of feeding highly fibrous roughages. Development of fodder tree plantations on degraded and dry lands and reclamation of ravine and saline lands will not only meet fodder needs but also enhance green cover and recharging of ground water table. Presently, farmers are totally ignorant of the ill-effects of livestock on global warming. Hence, a serious awareness campaign should be organised to involve them to adopt eco-friendly practices to reduce the ill-effects.

Indeed, the strategy for India should be to promote such eco-friendly activities which will help in mitigating climate change while supporting sustainable livelihoods for the poor. Development programmes should motivate common people to take active role by showing immediate benefits for them. While involving the poor in development programmes, it is necessary to ensure that the participants have opportunities to earn their livelihood, while contributing to the cause of development.

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Conserving Orans for sustainable livelihoods

Aman Singh and Aditya Gupta

Orans are a source of food fodder, water and fuel to the livestock communities living in the foothills of Aravallis. Local communities, with the support of KRAPAVIS, an NGO continue to uphold the beneficial practice of preserving Orans.



Meena ki Dhani, located in Alwar district of Rajasthan, is a fairly large tribal village with an approximate population of 1000 people spread across 100 households. Majority are farmers or pastoralists. The major crops grown are bajra, maize, jowar, til, chola onion, wheat, mustard, gram and barley. Due to the high involvement of many villagers in livestock farming there is a huge number of domestic animals kept by families in village. There are cows, buffaloes, sheep, goats and camels. The number of buffaloes and goats – more than a thousand each – deserves special mention.

Located in the hills surrounding the village of Meena ki Dhanni is Adaawal ki Devbani, also popularly called as *Orans*. The total area covered by the *Oran* is close to 150 hectares. The *Oran* is rich in bio diversity. There are roughly 3420 trees reported to be currently growing in the *Oran*. Nearly 15 species of trees like dhak, kadamb, keekar are widespread in this *Oran* and are used by the villagers for the food, fodder for livestock, fuel and medicines. Wildlife like sambhar, nilgai, wild pigs and peacocks form part of the *Oran*. A few species like the leopard and the tiger, which used to roam these woods a few decades ago, have now disappeared.

Traditionally the upkeep of *Oran* was the responsibility of village institution called Thain. With the disintegration of Thain, modern institutions like village panchayat have displayed little interest in the management of *Orans*. Increasingly it is found that local population have been excluded from the management of their resources, thus, leading to its degeneration.

Krishi Avam Paristhitiki Vikas Sansthan (KRAPAVIS), a Rajasthan-based voluntary organisation (NGO), founded in 1992, concerned with these issues has been working on community centered revival of *Orans*. KRAPAVIS has been working at three levels – at the community level in reviving *Orans*, at the individual level in addressing their livelihood issues and at the policy level,

to bring in changes in State policies with regard to *Oran* management. KRAPAVIS has been working towards restoring 100 *Orans* encompassing 2000 hectares, covering 100 villages of Alwar, Jaipur and Dausa districts of Rajasthan.

Conserving Oran

In Meena ki Dhani, people were first organised into ‘van samiti’. A number of meetings were organised to educate the village members about the benefits of conserving the *Oran* and the Devbani.

People participated enthusiastically in the *oran* conservation programme. They first attempted to rehabilitate water storage structures. Utilising traditional water-harvesting techniques in conjunction with modern scientific expertise, water storage structures (talabs) were renovated using local material. In some places new talabs were constructed. Prior to that, geological analysis was done to decide the strategic placement of talabs. The place was also decided based on the fact that there was enough runoff contributing to it. Talabs were constructed using local materials like clay, stone/ rock, grasses and buffalo dung - which serve to keep them affordable and replicable. Pipes were laid down to agriculture fields for irrigation. Water availability and water efficiency are continuously monitored.

Protecting livelihoods

Agriculture in this region totally dependent on rainfall. Moreover, as the topography is undulating, agriculture fields are prone to soil erosion leading to loss of soil as well as water. There are other problems in agriculture such as unavailability of traditional seeds and high use of chemical fertilizers and pesticides. Use of chemicals besides affecting the soil has also been a cause of food poisoning in the animals fed on the agricultural waste.

To address the issue of soil erosion, structures like ‘Tak’ gully plugging, Medbandhi/ field bunding were taken up on the farming lands. Trenching, field levelling were the other activities taken up.

Orans are local micro bio-diversity reserves harboring the shrine of a local goddess or deity. Found in the foothills of the Aravalli ranges, most *Orans* have sources of water, either small springs or rivulets running through them or a variety of ponds and nadis in their midst. These can cover fairly extensive areas across interspersed habitation. These local forests vary in size from a hundred to five hundred bighas (about hundred hectares).

To curb the use of chemicals, farmers were motivated to practice traditional methods of cultivation which are nature friendly. Afforestation is also carried out in the land near the johads. Tree plantation has been undertaken to increase the number and variety of trees and also arrest soil erosion.

As majority of the people are also pastoralists, a number of activities were taken up to help them in livestock production – promoting breed improvement and organising animal health camps; training local people as animal health workers to provide services at the door steps. Widespread scattering of grass seeds has been carried out to increase grass cover for the cattle to graze power.

Results

Positive changes include an increase in ground-water levels and water retention and improvement in soil quality, increased vegetation cover and the reappearance of locally-extinct species. With water conservation activities, there is a significant increase in the level of the water table. Continued supply of water even after the monsoons has provided assured water supply for irrigation. There is more greenery in the surrounding area – more plants and trees able to survive the harsh summers. Greater volume of grasses



Photo: KRAPAVIS

Orans serve as a source of fodder for livestock.

Local communities actively engaged in maintaining water structures in the Oran.

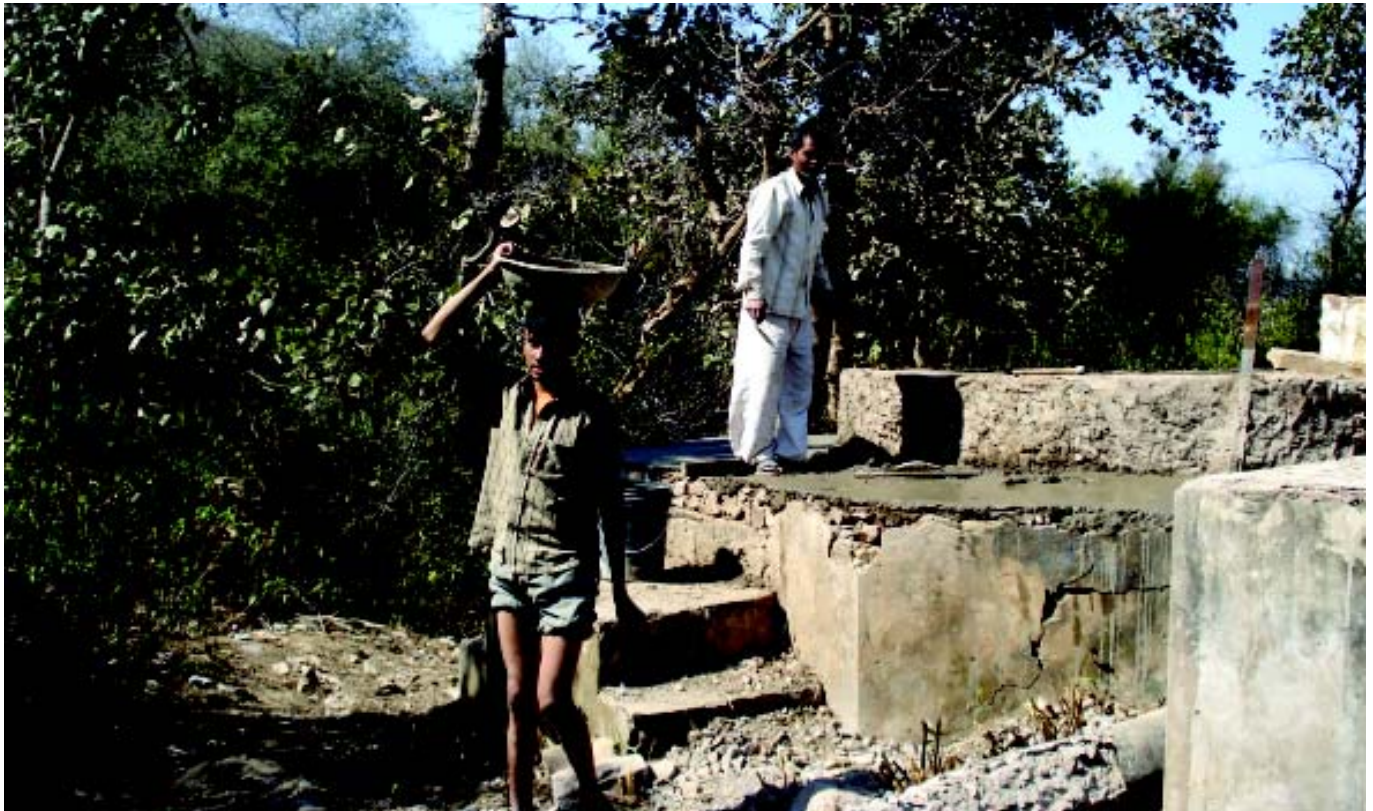


Photo: KRAPAVIS

and shrubs has enabled more animals to graze freely. Local ecosystem is restored and protected. Species like nilgai, rogia and a few varieties of monkeys are among the ones which have reappeared in the last few years.

The initiative has also strengthened the economic opportunities for local communities by establishing 'Van Samiti' and self-help groups (SHGs) for women, dealing with issues such as tree, plant and animal health, breed improvement and fodder management. Minor non-timber forest produce, such as honey, ber (fruit), grasses for basket making and clay for pottery sold in the market, have become a source of income for the women.

The property of the *Oran* is now common to all the villagers – they can graze their cattle, use the water for animals and irrigation but must not cut the trees. There is a strong internal social control system within the different communities of users which enables effective sanction on the violators. There is a mechanism for conflict resolution among resource users and strong stake holdership of resource users which is evident in terms of annual contributions received for maintaining the orans.

"Yadi hamara devbani thik to sab kuch hai; yadi yah thik nahi to chara, pani aur bhojan ke lale." (If our oran is intact we have everything; if not, we suffer from lack of fodder, water and wood" because *Oran* 'Aval' is our livelihood)

-People of Meena ki Dhani.

Orans embedding a complementary relationship amongst biodiversity, livestock and agriculture is important to the livelihoods of the resource users, meeting economic, social, cultural and spiritual needs of the community. The people continue to uphold the beneficial practice of preserving the Devabani with the support and guidance of KRAPAVIS.

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Pastoralists struggle for regaining rights over conserving orans

T M Radha and **Aman Singh**

Pastoralism is a way of life for people living in Loj-nathusar village. Located at a distance of 50 kms from Alwar town in Rajasthan this small village comprising of 30 households is a part of the core area of Sariska Tiger Reserve. The village is on the fringe of Dev Narain Oran, which stretches to an area of 150 hectares and is the source of survival for the people as well as the livestock.

Majority of the households in the village belong to Gujjar community, who are basically pastoralists. The number of livestock spread over this area is quite huge – with each household owning goats, cows and buffaloes and some also owning camels. One can find around 1000 goats, 400-500 buffaloes, 200 cows and 50 camels in this area. From ages, these communities have been depending on Orans, a source of food, fodder and fuel.

With the State taking over the control over these *Orans*, the communities lost control over these orans. The neglect of orans have had great impacts on the lives and livelihoods of people. Women had to travel longer distances in search of water, fuel and fodder. Loss of rich biodiversity meant that people had less access to food (ber, kair, sanwa, honey etc) and medicinal sources. All this meant that the lives of the pastoralists became harder.

With the support of KRAPAVIS, an NGO in the area, the Gujjar communities have organised themselves and are working together in conserving the *Orans*. On the other hand, KRAPAVIS

has been raising voice on their behalf in the government circles to bring about a change in the policy.

Orans, even to this day, support the lives of these Gujjars for around 8 months period when they have sufficient fodder for the livestock. During those months, the village produces around 18-20 quintals of milk a day which is sold in the nearby market. But during the dry months i.e., April-July, pastoralists can no longer depend on orans for fodder and water. The temperatures rise very high and the forests are dry. People migrate to the nearby villages along with their livestock. They tie up with the local farmers in the area they visit, help them get dung/manure from their livestock and in return get some fodder for the livestock.

The inhabitants of Loj-nathusar village continue to make a decent living depending on the orans which they revere. They recognise its importance and are united in its conservation. But the greatest challenge is to protect the orans from outsiders who come and cut the trees. Local communities feel that they have no control on outsiders who lop the trees with the connivance of local officials. One person from this village represents the local panchayat but one has not been successful in influencing the local panchayat on this issue.

The struggle continues, but with support of agencies like KRAPAVIS, the communities are hopeful and confident that they will be able to succeed. The NGO's effort which has resulted in inclusion of communities in oran management in the State Policy Document is just one example and a hope for the future.

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Eco-friendly goat husbandry for sustainable livelihood of small farmers

Narayan G Hegde and
Rajendra K Mahuli

Goats are increasingly seen as a threat to the ecology as they feed on any type of plant species. But goat keeping continues to be an important livelihood activity for the resource poor people. BAIF has promoted a number of initiatives with twin goals of helping small farmers in rearing goats and also protecting the environment.



Photo: KRAPAVIS

Goat keeping is an important activity for the people in Burdwan and Bankura districts in West Bengal. Most of the goat keepers are landless or own small pieces of land, living in poverty. Some of the villages are surrounded by forests which provide adequate fodder to the livestock. However lack of awareness among goat keepers on aspects like breeding, health, marketing etc., has resulted in high rate of mortality. Goat keepers have been struggling hard to maintain a decent living with goat rearing.

The initiative

BAIF, a development organisation, studied the existing goat rearing practices across the states of Gujarat, Rajasthan, Karnataka and West Bengal to understand and improve the existing situation. Based on the study, it initiated the sustainable goat rearing programme, focussing on breed improvement, feeding, health care and marketing. Over 135 villages covering 10,000 goat keeping families from Raina II and Kanksha blocks of Burdwan district and Ranibandh and Raipur blocks of Bankura district were covered.

The project was implemented jointly by local voluntary organisations namely the Deepan Yuba Goshti in Burdwan and Socio-Economic Development Programme in Bankura, BAIF and the Animal Resources Development Department (ARD). The ARD provided the technical support for selection of breeding bucks, training of field functionaries to be engaged in the project, critical health care services such as vaccination against important diseases and veterinary services wherever needed. The local NGOs were responsible for implementing the project.

Field Guides, experienced in goat husbandry, were identified to motivate goat keepers to adopt best practices which can enhance the growth and health conditions. Field guides were selected from the same village so that in the long run they could promote various development activities as well. Each Field Guide was responsible for 1-2 villages depending on the number of goat keepers. They were trained on a number of aspects like breeding, feeds, health and marketing. Training of Field Guides every month was a strong aspect of the project.

Organising goat keepers' groups

Goat keepers were organized into groups consisting of 5-7 members. SHG women who had prior experience in goat rearing were selected. Also those living close by were preferred to facilitate regular interaction. Each goat group has a leader known as Mukhia. The members were trained on best goat husbandry practices such as feeding of goats, forage production, feeding of mineral mixtures and concentrates, housing and health care. Each goat keeper is responsible for taking care of her/his herd.

Group meetings are held every month. During these meetings, members discuss on goat maintenance, health care, castrations carried out, causes of mortality, number of goats sold, realisation of price, etc. The members were encouraged to adopt improved rearing practices. They organised micro-credit, input procurement, sharing of technical knowledge and collective marketing to increase their earning.

Demonstrations on feeding and fodder production

Field demonstrations on feeding of concentrates, mineral mixtures and green fodder were organised by providing critical inputs and technical advice to selected goat keepers. Field guides regularly advised them to provide supplementary feeding, using locally available feeds. Goat keepers were encouraged to weigh the goats maintained under these trials to record the benefits of various feeding practices.

Improving breeds

The goat rearers had little knowledge about goat breeds and good practices to improve their productivity. Black Bengal, a breed well known for its superior quality meat and skin, originated in West Bengal is found in Bankura, Murshidabad, Purulia and Burdwan districts. There has been indiscriminate natural breeding owing to prevalence of different strains of Black Bengal breed. Each group was provided elite bucks for providing breeding service to does owned by the members. These bucks have typical Black Bengal breed characters, selected on the basis of their superior genetic characters.

Maintaining health

The goat keepers were not aware of vaccinations and deworming. As a result, many families lost goats and had given up goat rearing. Deworming medicine which cost less than Re. 1 per dose, was procured by the project and supplied to the Field Guides for treating the goats. With the introduction of vaccination and deworming, the mortality rate decreased steeply to below 5%. Village wise camps are regularly organised with the help of the Prani Bandhus as well as the local ARD Department staff.

Goat rallies are organised regularly in lean farming season with the objective of sharing the outstanding goat keepers' experiences and to demonstrate the best animals produced locally by the participants. It also provides a platform to get higher price for

Economics of goat keeping

Average goat keepers have 6-8 herd size with a composition of 3 does, 2 male kids and 2 female kids. With this stock, the goat keeping family will have 9 new born kids per annum. With good health status, there will be 8 surviving which will be available for sale (4 F + 4 M), which fetch about Rs. 6800 - 7000 per year. Male kids of 10-12 months will fetch Rs. 1200 to Rs. 1500 while the females fetch Rs. 1000 to Rs. 1200. Deducting the expenses on service charges, deworming, vaccination and treatment at the rate of Rs 200, the net annual income will be Rs. 7000 to Rs. 8000 per family, giving a boost to the income by over 100%. The factors contributing to increased income are increase in weight of new born kids, number of kids, improved growth rate, reduced mortality and higher price realisation due to better marketing negotiations. The goat keepers in general, do not spend anything on the feed and fodder inputs, mainly due to small herd size and availability of plenty of green fodder on common lands as well as private lands.

superior quality goats. Farmers from non-project villages also attend the goat rallies.

Marketing

Most of the goat keepers sell their goats to local traders or middlemen in their village whenever they are in need of cash. In the absence of weighing practice and awareness about the price for goat meat, the goat keepers are being heavily exploited by the traders.

The goat keepers were exposed to market information on price of live goats and goat meat in local and larger markets in the nearby towns. Further, to enable them to assess the value of their goats, a spring balance was provided at each village for weighing of the goat by the participants. The Field Guides visit each household and weigh the goats periodically and estimate the price.

The sale of goats is usually well planned in advance by the villagers. The bucks are insured against death. During cultivation season whenever there is shortfall of money, castrated goats are sold for purchasing agri-inputs. During festivals, there is a huge demand for the Black Bengal goats. Price varies on the basis of skin texture and colour. The price may go upto 120 - 125 per kg live weight. Breeding buck fetches around Rs. 2000 - 3000 and sometimes, even more.

To prevent distress sale of goats, micro-credit is being arranged through SHGs. Generally, selling of goats either directly to a butcher or in a large urban market will fetch higher price. However, most of the women goat keepers find it difficult to organise such selling directly. They are also often reluctant to entrust this work to their husbands because of fear of not getting the entire sale proceeds. The goat keepers are therefore encouraged to organise collective sale in large markets.

Conclusion

Goat keeping is particularly important for resource poor people to improve their livelihood conditions. Both rural men and women can effectively manage this activity. Their contribution in enriching the grazing lands through manure is grossly neglected. Improved productivity will motivate the goat keepers to reduce their herd size and ease the biotic pressure on the ecosystem, which has direct impact on ecological restoration. Close interaction among SHG members will help them to build their capabilities and initiate other socio-economic development activities.

Goat development should be given priority, primarily to assist the small farmers and poor families who are dependent on goat husbandry for their livelihood. Simultaneously, utmost care should be taken to avoid its ill-effects on the bio-diversity and the environment.

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Food as a universal right

Olivier De Schutter is the United Nations special rapporteur on the right to food. He aims to inform people at the highest political levels about the role that smallholders play in the world's food production systems. He hopes that this will make decision-makers more sensitive to their needs and rights.

Olivier De Schutter's efforts to promote the full realisation of the right to food and the implementation of national food security measures, may have contributed to the fact that agriculture is back on the political agenda after some 30 years of neglect.

Politicians and policy-makers now frequently discuss the crucial role of agriculture in development. What will be the future of agriculture?

There are contrasting views about precisely what needs to be done, and the question is complex because many policy-makers seem to think that today, there is a trade-off between the various objectives that any agricultural policy must combine: improving levels of production and raising the revenues of small producers, while respecting the environment. There is also a clear schizophrenia within governments: while more market liberalisation is sometimes seen as a solution to encourage production, many realize on the other hand that this squeezes out the smallest and least competitive production units, which is exactly not what we want to achieve, as this increases inequality and poverty, and therefore hunger. In this context, a serious ideological battle is being fought. The problem, as I see it, is that large agribusiness corporations exercise a disproportionate influence on governments, while small farmers are not involved in most processes.

Then what is the relevance of all your highlevel meetings for the lives of small farmers in Africa and Asia?

There is often a serious disconnection between the high-level officials I meet and the poor farmers, living in the most marginal areas. I see my role as trying to understand the needs of the most vulnerable, and ensuring that policy-makers are made sensitive to those needs and are more accountable. The right to food is about raising accountability. It's based on the idea that you cannot work for the poor without the poor.

But what is the impact of high-level declarations to global developments in agriculture? Will they really convince governments to implement better policies?

There are important vested interests in the existing system, despite its failures: it has succeeded relatively well in raising production, but failed in addressing the root causes of hunger. Things can change, however. Two levers are important. First, through international meetings and the preparation of declarations, we can change the perception of governments about what needs to be done, and gradually arrive at a common diagnosis. Second, through improving accountability at the domestic level, particularly by encouraging countries to set up national strategies by participatory means and to establish consultative bodies, we can increase pressure



Olivier De Schutter

on governments, and ensure that their efforts will be appropriately targeted to the needs of the most vulnerable. These tools should not be underestimated. Together, they can lead to real change.

During the last world summit on food security in November 2009 in Rome, the UN have called for a reform of the Committee on Food Security (CFS). What real impact can this reformed committee have for small farmers in the world?

It will be important to see how the Committee on World Food Security (CFS) will function, under its new composition and with its new role. During a second phase of its work, the CFS should adopt a global strategic framework – a plan of action at global level, identifying measures that governments and international agencies should take. It should set priorities and guide the work of development co-operation and investment in agriculture. This has the potential to improve the understanding of governments about what needs to be done to eradicate hunger and malnutrition, and of raising the accountability of all actors – donor governments, their partners in developing countries, and international agencies. It also has the potential to improve co-ordination across different international agencies. For it is bizarre, to say the least, that within the World Trade Organisation, countries are pressured to relax the measures that protect their agricultural sector in the face of foreign competition, while at the same time they are told to support smallholders and to diminish their dependency on international markets to feed their populations. The CFS should ensure that these inconsistencies do not persist. All governments and international agencies (both from within the UN system as well as outside it, such as the World Bank, IMF and WTO) and also civil society and the private sector will have to justify their choices in the face of a shared diagnosis of the priorities. This can be significant. But whether or not real change will result, will depend on whether they in fact agree to subject themselves to this collective evaluation. Will they act co-operatively? Or will they continue to prioritise their national interests and ideological agendas? This is the real test for the future.

What should small farmers do to get their voices heard?

They must organise themselves! I am encouraged to see, for instance, how fast co-operatives of small farmers are developing. This means that small farmers improve their bargaining position and can improve their access to infrastructure or to public goods such as storage facilities, information about prices, or transport. It also means that they will find it easier to be heard at all levels, from the domestic to the international level. I am convinced that we would not have seen the mistakes of the past if small farmers'

organisations had been better involved in decisionmaking. I refer for instance to marketing boards that bought crops from farmers at very low prices either for export or to ensure low-priced food for the urban populations. But also the insistence on export-led agriculture in general, which has increased inequalities between larger, better-off producers and small farmers living on the most marginal lands. Farmers' voices need to counterbalance the corporate sector in setting the agenda for agricultural and rural development.

Agriculture is affected by climate change, but also contributes to it. Livestock production has a big influence on the emission of greenhouse gases. Is this not a dilemma in promoting farming?

The increase in livestock production, in response to a growing demand for meat, tightens the competition for land between its various uses. Together, grazing land and cropland dedicated to the production of feed-crops and fodder already account for 70 percent of all agricultural land, or about 30 percent of the land surface of the planet. And in certain regions it is a major cause of deforestation or soil degradation, as a result of overgrazing. In a 2006 study called *Livestock's long shadow*, the FAO noted that if we take into account deforestation as a result of the creation of pastures and production of crops for feed, livestock is responsible for 18 percent of the total greenhouse gas emissions, almost double the share of transport.

share of transport. Yet, at the same time, we must recognise that no two kilogrammes of meat are the same. Farm animals raised in industrialised countries consume more than five calories in feedstock for each calorie of meat or dairy food produced, and some estimates put that figure much higher, establishing a relationship of up to 17 units to one. But these figures represent the production of meat in rich countries, which is heavily industrialised, and it relates to animals fed on grains. In India, the ratio is a less than 1.5 to one. In Kenya, where animals are not fed grain but live off grass or agricultural by-products which humans cannot eat, livestock actually yield more calories than they consume. And it is equally important to acknowledge that livestock rearing represents a source of income for perhaps up to one billion people, representing one third of the poor in the rural areas.

In 2008, the IAASTD report on the world's agriculture was published. You often urge governments to take this report more seriously, but even the extensive summary is difficult to read. Can we expect governments to use this report as an input in their agricultural policies?

The IAASTD is the result of a considerable amount of work, by some of the most renowned experts in the world. The obstacle its reception faces is that it calls for a paradigm shift in the way we conceive agricultural development and innovation, with a focus on the needs of the most vulnerable and on sustainable agriculture, away from the technological approaches of the past. We may need to break down the conclusions of IAASTD into parts, and treat separately those that relate to trade, those that relate to seeds and genetic resources, and those that relate to rural development, for

example. Of course, all these issues are linked. But the task seems insuperable unless we cut it down in separate chunks.

China as a growing economy is becoming a more and more important player in the global political and economic system. China supports Africa with money and advisors. Their relationship with developing countries is very different from that of the EU or the UN. What does this mean for small farmers in Africa?

China has to feed approximately 20 percent of the world's population with about seven percent of the world's arable land. Its population is still increasing, and its capacity to expand agricultural acreage is limited. They are in fact facing a rapid loss of arable land and a large amount of soil erosion, and their access to water is precarious. The melting of the great glaciers of the Himalayas will make their position less and less tenable in the future. It should therefore come as no surprise if they seek to invest in agriculture abroad, particularly in sub-Saharan Africa where land is available and where labour is relatively inexpensive. For the local communities, the arrival of investors often means that their access to land, and therefore their livelihoods, will be affected. Some small farmers will be moved to more marginal, less fertile land. Others may be offered waged employment on the large-scale plantations that investors will develop. Others still will have no alternative but to migrate to the cities, with little prospect of decent employment. These risks cannot be underestimated, and it is therefore vital that investment in agriculture be carefully guided, and that local communities be involved in negotiations that are conducted with such investors.

Some people plead for a clearer dichotomy between big and small farmers in the West: on the one hand, industrialised farms competing on international markets and on the other hand, more ecological farmers, near to markets and consumers. Would that be a strategy for the whole world or should all efforts go to small farmers on a global level?

This is still an open question, in my view. The coexistence of very large, agro-industrial farms, and small-scale, sustainable farming, is something a country such as Brazil is trying to achieve. At a minimum, it requires strong support of family farming by the state. Smaller farms, while very productive per hectare, are more labour intensive and thus produce at higher costs. Therefore they must be supported, or they will be wiped out in increasingly competitive markets. Governments can support family farms by providing loans at lower-than-market rates, by adequate public procurement policies, by supporting farmers' organisations, by providing access to credit and insurance against weather-related events or crop losses, and by supply management policies or buying policies to establish public stocks that can ensure stable revenues. I don't think we should place too many hopes on the attitudes of individual consumers. Although these attitudes are changing (consumers pay greater attention to where food comes from and how it was produced), price remains a determining factor for them.

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Livestock services to family farmers: free or fee?

Livestock services are crucial for a healthy, resilient stock of animals. Small-scale family farmers need these services too, but how do they profit best and how can service delivery become most sustainable? Should it be “public good”, financed and organized by the state, or can private corporations do a better job? Two views...

Private providers serve farmers best



Economic theory argues that private markets serve people's individual needs best. For livestock services, this means that private providers are most efficient at delivering services such as artificial insemination and clinical veterinary care, (“private good” services). The government should manage areas such as surveillance of contagious diseases, food safety and overall policy development (“public good” services).

Recent evidence suggests that the poor do not necessarily benefit from subsidised services; poor people are even willing to pay for good services for their cattle and; commercialised private practice reaches more farmers, more equally, and at lower cost. Then, why should private providers not deliver good quality services? Firstly, many services may require high investments for private parties. Next, given the generally low education of poor livestock producers in developing countries, public veterinary authorities often make the point that private veterinarians are likely to resort to exploitative practices. This does illustrate the importance of strong institutions in regulating behaviour, enforcing ethics, disseminating information and providing an effective regulatory and legal framework.

In poor, marginal areas, the demand is too low to sustain profitable private services. Possible alternative models are the community based delivery systems which tend to be far more responsive to local requirements than are government services. Thus, the recommendation to governments to privatise livestock services is too simple. There is a need for task sharing between the private and public sectors. A strong and accountable state can be responsible for policy development, pay for “public good” services, and regulate the delivery of “private good” services by the private sector. The debate on livestock service delivery is therefore embedded in the larger debate on institutional development and political economy that are part of larger economic reform agendas.

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This piece represents the personal view of the author and does not necessarily reflect the opinion of FAO.

Not private, but democratic Veterinary Health Services!



During the past two decades, global financial institutions such as the IMF and World Bank have imposed neo-liberal economic reforms upon developing countries, which has meant a uniform “development prescription” to privatise and dismantle vital public services (healthcare, education, sanitation, water, and energy), including animal services. International institutions such as FAO and IFPRI advocate so-called “pro-poor” reforms for veterinary health care by creating private, self-supported community animal health workers. “Pro-poor” reforms place the responsibility for health services on the individual's capacity to buy and sell these services. He is supposed to enter the “business” of healthcare.

Pushing veterinarians into privatisation leads to less accountability and not more, because they are forced to practice “health for profit” and not “health for all”. The oft-used argument that the “poor can pay” is flawed. Often, poor households go into debt in order to avoid losing a cow: what is then the impact of the debt on the household economy? What food do they have to miss? What unjust survival choices are they forced to make? If the poor could pay, they would not be poor! The impact of privatisation in India is illustrative. There is a sharp decline in livestock ownership amongst the landless from 16 per 100 households in 1971-72 to just 1 in 2002-03, while the number of livestock increased only amongst the households owning more than 10 hectares of land.

Such figures show that the poor have been pushed out of livestock rearing, and profits have flown to the pharmaceutical and insurance companies. The nexus of government and private interests makes the former accountable to corporations rather than to its citizens.

The existing public veterinary health care system is far from perfect. Democratising the services would involve decentralised governance, appropriate extension work, prevention, accountability and transparency to farming communities. This demands greater public investment and not less, to enable a more effective and farmer-owned “free” service.

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Common land development

Strengthening institutional and physical spaces for poor livestock keepers

Rahul Chaturvedi and Sanjay Joshie

Investments in strong institutional arrangements in common property resources can contribute to better access to fodder and water for the poor livestock keepers. A strong institution and collective action has helped improve commons, thereby improving the livelihoods of poor livestock keepers in Udaipur region.

The communities are mainly agro-pastoralists who belong to tribal and non-tribal groups. Tribal communities are mainly located in the southern district of Udaipur with a more heterogeneous caste community inhabiting the other districts. Gujjar, Balai, Meena, Bhil, Jat, Rajput are some of the major caste categories found in these locations.

Livelihoods of communities inhabiting these areas primarily depend on agriculture and livestock keeping. More than 90% of the households keep livestock, which is composed of cattle, buffalo, goat and sheep holding. Women are primarily engaged in livestock keeping with her work spread from taking the animals out for grazing, to meeting out their water requirements to regular maintenance and up-keep. They also keep around 20-30% of their farm land as *beeds* which is used for grazing and meeting out fodder requirement of their livestock. With increasing land fragmentation there has also been a conversion of the beed lands for cropping which has further increased the reliance on commons.

With depletion of common property resources, they face increasing hardships to graze their livestock and meet out the energy needs of their household. In addressing common land development their inclusion and providing them a platform for decision-making is important.

Livestock keeping in these locations is a viable option for poor households if only a significant portion of the fodder and feed resources are derived from commons. The practice strengthening collective action and improving productivity of commons aims to strengthen the resources base used by poor households for livestock keeping. With majority of the households belonging to marginal and small categories, a strong collective action with active participation of these households helps in making the initiative pro-poor.

FES, an NGO helped revive institutional mechanisms that energize collective action and help in sustainable management of the resource in 439 villages spread across 5 districts in Rajasthan benefiting around 40000 families.

Focus on village institutions

Strengthening traditional mechanisms, where they are surviving, and crafting new institutional arrangements, where none exist, is an essential component of the work on common property resources.

The process of each village taking the initiative, to apply itself and create a formal body of terms and conditions to govern itself by, with regard to a common property resource, was the basis for the sustainability of local institutions and is a critical step towards the act of self-governance.

A village institution is formed. These are called by different names. It could be a Village Forest Protection Committee which can gain rights over forest, Charagah Vikas Samiti (Pasture Land Development Committee) which can work with Gram Panchayats on pasture land in the village, Tree Growers Cooperative Society (TGCS) which can apply for lease of revenue wastelands for 25 years, and also Watershed Development Committees which can, under the policy and program directives, address the village landscape comprehensively.

All the actors in a village constituted the members of the village organization. The members constitute a management committee (also sometimes referred as executive committee or functional committee). The general body chooses the members of the management committee from the different actors: farmers, livestock keepers, women, different caste groups, BPL families, deprived sections based on their location specific understanding of the differentiation they understand as a group within and also as processes facilitated by facilitating agency.

Our role was to strengthen the village institutions by capacity building. Further, we also played a role in facilitating negotiations in meetings at different levels of the government and its department making them aware of the policy provisions and measures, which can help communities gain rights to CPR resources and provide them incentive to invest their energy in it.

Together, these groups evolved a set of rules and regulations, which guided their interaction in reference to resource created. This process of drafting rules and regulation for management of CPRs was an important element as the robustness of the institution system is determined by way rules and regulations operate. We only promoted discussions against the broader set of rules and facilitate operational systems, which are mutually agreed and are sensitive to all actors. Some of the rules included providing labour opportunities to all families on a rotation basis; continuous wage opportunities for poor households payments at common place in a village meeting in the presence of all management committee members, etc.

Ecologically sound regeneration of common lands

Natural process of regeneration was aimed at. The focus not only helps in collective search for appropriate solutions, with community knowledge of their surroundings playing an important role, but also makes the practice cost effective and relevant for the different groups of livestock keepers in a community. The focus is to develop a protected patch with suitable mix of grass and tree species which provides different products to livestock keepers from grass, leaves and pods meeting the feed and fodder needs of both the large and small ruminants. Aspects like which species are planned, what is long term objective of it, what will be its effect on other species, whom it is going to benefit etc., are looked at. Discussions around these issues are initiated among different actors in a village. A collective search on appropriate solutions, lead to sense of ownership among the village actors of the process.

Distribution of benefits

Rules for distribution of benefits have the most important consequences for the members involved. The benefit sharing arrangements depend on many factors from the broad objective of resource distribution, to the condition and objective of resource growth, to number of households and their different demands, to the monitoring and enforcement costs of sustainable resource harvesting and the different alternative options available to complement or supplement the resource distribution.

Two main mechanisms can be seen in terms of fodder collection: Regulated and rotational grazing and cut and carry method. Different mechanisms for lopping of tree leaves and pods can be seen across villages. Some of the villages still have not allowed lopping tree based on the condition of the resource and also problems associated with monitoring of such use. For example, in Thoria, trees on plot are allotted to one or two households who distribute to all members. Trees are lopped after one month of monsoon, once in Nov-Dec and then in Apr-May.

In Saredi Kheda, trees on all commons are divided into patches, each patch allotted to different households with higher sheep/goat. Lopping is done after one month of monsoon in one plot; after 2-3 months in another plot (after Diwali). When rainfall is very low, one plot is left open for grazing, second plot is left open after 15 days of last rainfall.

In most of the villages, while drafting the rules and regulations, village takes a very holistic perspective of the overall resources and the usage patterns. Understanding the overall resource base helps the village community in making choices, which may sound complex but are location specific and take a dynamic perspective of the socio-economic and ecological interrelationship.

In the first two to five years, the plot is usually controlled for grazing by small ruminants. It's become important then that ample grazing space remains open for the small ruminants so that they are not the one who loose out. Simultaneously, it has also been learnt that the communities would like to invest in making different kind of plots. In some plots, they would like to have intensive work done, but on another plot, apart from securing the rights

over the commons, they would like a different kind of intervention (seeding of grass with some soil and moisture conservation work with no plantation). What is important in the context is, that there is high gestation period in resource growth, especially of trees, against which project interventions of 3-5 years is quite small in improving the biomass availability on all the village commons. The village community understands this important constraint and wants action on different patches in phases, regenerating one patch after another. This clearly brings out the need to have broader understanding of the space and time in which common property resources management should be placed.

FES in its initial work with TGCS learnt the lesson that motives like maximisation of revenue generation and income makes the distribution mechanism highly inequitable. This involves mechanisms like auction, which lets the highest bidder privatise a common property resource. Institutions, which aim to do so, can earn good amount of money, and there have been incidence where institutions have been offered between Rs 100000-200000 for an area of 50 ha. With clear membership boundary and primacy to needs of the villagers, these motives are usually checked, but within village also the regular efforts need to be put in to form a rule, which makes the resource available to all.

Results

Community has gained rights on some common property resources; government acknowledges the strength of village institutions in management of commons and supports institutions in resolving conflicts. However, it still views commons as an un-productive resource and stills aims to fulfill different objectives on commons.

Forest department recognizes the community institution strength in regenerating forests. However within, still a large group feels that communities should not be allowed to manage forests.

Within the village, there is a clear understanding of land categories on commons; demarcation of boundaries and removal of encroachment (mostly those which are very prominent and new); Collective action to protect commons; less dependence of poor households on resource rich framers for fodder, leaves, pods and fuel wood; increased spaces for poor and deprived sections to participate in village decision making process; improved spaces for women in village decision making processes; reduced resource conflict - previously visible in scarcity period where the socially and economically powerful gained, with improvement in the resources base. Strengthened institutional spaces for poor households enable them to actively participate in decision making processes with its impact on social-economic-political factors.

With increased grass production and tree coverage, palatable fodder availability in terms of grasses and lopped tree leaves from protected commons increased. Increased fodder availability from different sources helped livestock keepers to meet the feed and fodder requirement of their different livestock across different time periods. Grass biomass availability increased from a low of 0.26 ton/ha to a high of 8.5 ton/ha based on the condition and location of commons. Value of standing biomass on protected commons ranged between Rs 32000 per ha to Rs 365000 per ha.

Reduced risks and vulnerability to fodder scarcity helped poor livestock keepers to invest resources for livestock development with very low input costs.

Protection and regeneration of commons with work to check runoff water significantly changed the land use and cover in the villages. This is more visible where the work was done in a contiguous patch, for example a watershed. Analysis of Thoria watershed over different time periods gives strong evidence that if biophysical interventions and institutional development is promoted on commons in a contiguous patch, there are dynamic changes in the biophysical environment. This trend was also seen in other villages where work on common property resources of land and water not only improved the overall biomass growth on common land areas but also influenced the agricultural area, through increased water availability.

The proportion of households reporting increase in milk production was 50 per cent of the sample household in the villages. The surveyed households (100% of households) attributed the increase in milk production to increased fodder availability. Discussions with different groups also highlighted the role of dairy cooperative societies in providing services and market linkage, improved water availability and improvement in cattle breed as other important factors in influencing growth in milk production, clearly reflected in Thoria village where the milk sale figures of the district co-operative societies and private dairies indicate a consistent growth rate despite low rainfall years. With improved fodder availability and institutional support of dairy, the vulnerability in livestock sector especially for the poor livestock keeper can be reduced and even in extreme low rainfall years, their livestock system remains strong-footed.

Another interesting finding gained was with improved trust of villagers on the service providers for artificial insemination, with marginal and small farmers investing in improving their non-descript breeds. This, which has been broadly argued as an important factor to improve productivity, has also improved income earnings of poor livestock keepers who with reducing vulnerability and risks invest resources for asset improvement. This trend was visible in Jodha ka Kheda and Gudha Gokalpura villages where landless and marginal families kept more than 50% of crossbreed animals.

Lessons learnt

- Work on common property resources should address differentiation and discrimination within the village communities based on caste, class, gender, livelihood systems etc. This perspective helps in making the initiative of regeneration of common property resources pro-poor with special emphasis on the inclusion of the poor households in the institutional framework.
- Strong and dynamic institutions (ughai, hathai, bani etc.) which recognizes traditional institutional arrangements are location specific, adhere to the broad principles of common property resource management, are more likely to survive and be sensitive to the needs of poor households and livestock keepers.

- The resource growth on commons is not linear and homogeneous. A range of factors, which change at village level, influences it. Even within a village, two different plots have shown different resource growth.
- Secure tenure and assurance of benefits from commons are important to mobilize community for common property resources management.
- Strong focus on endemic species provides the livestock keepers a share in the growth from increased biomass availability
- Work on common property resources of both land and water have a greater impact on the livelihoods of poor livestock keepers: water and land are critical constraining factors in livelihood systems of households living in semi-arid areas.
- The success of common property resources management generally speaking is more possible in small villages (with total households less than 200-300).
- Improved common property resource can provide opportunities for additional livestock keeping and also result in increased income opportunities.

Conclusion

The efforts towards protecting the commons provides immediate returns in terms of increased availability of biomass, improved soil and moisture regime, and where geo-hydrology supports recharge, an increase in the water table and an associated increase in area under cropping. With strong institutional arrangement, investments in common property resources can contribute to the improvement of the livelihoods, especially of the poor livestock keepers, with increased access to water and fodder. Besides benefiting directly from improved availability and access or palpably sensing equality in terms of low or no pricing for such produce, the restoration of commons is akin to land redistribution to the poor. This helps reduce the vulnerability of poor livestock keepers to environmental and economic uncertainties, thereby stabilizing the livestock sector. Improved commons also provide a strong collective and ecological foundation to further assist the poor livestock keepers driving the livestock growth.

An important change the practice brings is that it places a strong village institution as an important actor within the system. With a strong institutional platform and collective action the conflicting interest groups within village align for a common purpose - regeneration of commons.

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Leading a flock of sheep

An inspiring account of Veerakempanna

Sheep are the gift to dryland farmers by nature which can yield returns within 1.5 years of investment, says Veerakempanna. Veerakempanna of Anoor village in Chikkabalapur district, like any other dryland farmer in Karnataka, unable to meet the ends with dryland farming alone, was supplementing his income by rearing some local breeds of sheep.

From the beginning, Veerakempanna has been keen on rearing sheep on his farm. He feels that while dairy requires higher investment, poultry is risky and goats are highly susceptible to disease and cause damage to the environment. But the local breeds that he had were of low productivity with low quality wool. In 1973, he saw some exotic sheep breeds in the congress exhibition held at Bangalore. He was interested in improving his local graded *Bannur* sheep with this dual purpose *Corriedale* ram one. But he could not afford it at that point of time. In the next five years, Veerakempanna somehow managed to mobilise resources and bought the dual purpose *Corriedale* ram. This marked the beginning of his journey as a sheep entrepreneur.

A keen learner, Veerakempanna visited various farms, local veterinary hospitals and the research institutes to know about the various diseases and learn how to treat them. With careful management, Veerakempanna was successful in getting good returns from sheep rearing. In a few years, the number of sheep on his farm increased to 60. Further, he went on to learn the nuances of shearing, grading, spinning and weaving from Dr. Kareem Khan, a scientist at Ranibennur. He took around 500 kgs of wool to Ranibennur, which was weaved in to blankets and sold.

By the year 1995, Veerakempanna bought another 6 acres of land by the income generated from his sheep rearing. He made a number of innovations in feed management. He earmarked some land exclusively for cultivating fodder. He started growing fodder sorghum. Besides feeding sheep with green fodder, he started converting the excess fodder to silage and hay. Gradually he also adopted stall feeding for the sheep along with open grazing. He continues to supplement the feed with nutritional additives. In future, he plans to prepare and use fodder pellets in stall feeding.

Also, Veerakempanna has been successfully integrating his cropping as well as livestock systems. While the crop residues form a source of feed to the sheep, the sheep manure is applied back to the soil. The most important objective of letting the sheep graze on his lands is to enrich his soil with its urine and manure. He collects the dung from the stalls and applies to his land.



Stall feeding for effective feed management.

Veerakempanna sells off the additional sheep manure which is in great demand, also helping in improving the soil fertility in the neighbouring fields.

Veerakempanna has received a number of awards for his skills in sheep breeding, for promoting stall feeding and promoting integrated farming systems. He represents a number of committees working on sheep improvement. He is a much sought after resource person by the government departments as well as NGOs. He has been spreading knowledge on sheep rearing widely. Also his farm has been attracting a number of visitors from India and abroad.

Today, Veerakempanna's farm is a place of learning. He trains a number of people on sheep management. He helps sheep rearers in breeding improved breeds. He guides all those who are keen to start sheep rearing. A true 'inspiper' indeed.

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This article was prepared on the basis of interactions with the farmer by Mr. Ranganath Babu and Mr. B V Joshi, AME Foundation, Bangalore.

Unpacking a poultry myth

Mamta Dhawan, Lucy Maarse and Ugo Pica-Ciamarra

Recent evidence from India suggests that rearing indigenous poultry rather than focusing on commercial breeds that give a higher yield can significantly contribute to the self-sufficiency and cultural wealth of rural communities – as well as boosting their income.

Over the last decade, high demand has caused the poultry sector to expand, globalise and consolidate, turning it into possibly the fastest growing of all livestock sectors.

In India it grew by nearly 10 percent between 1997 and 2002 and broiler meat is currently sold for half the price of lentils, traditionally considered the poor's main source of protein. In recent years, however, NGOs and governments have supported the introduction of "improved" poultry breeds in rural areas (commercial hybrids produced from two or more different strains). If these are reared under the right conditions, they give a higher yield in terms of both eggs and meat than indigenous breeds. But is that necessarily always the right way to go?

Indigenous breeds: the benefits

Traditionally, farmers in rural areas tend to prefer indigenous birds to these commercial hybrids. Indigenous breeds are self-propagating; they contribute to poultry diversity and cultural heritage and produce tasty meat and eggs. They are also well adapted to the local climate and can survive, produce and reproduce through scavenging. Because of their local origin they are less prone to disease or predator attacks, and their cultural and sporting values secure additional income. Even their coloured feathers can bring in additional cash. But since commercial strains have become popular and heavily supported by state and NGOs, the percentage of indigenous birds reared in India has dropped to just 10 percent of the total over the last 30 years (absolute numbers have remained relatively stable). Yet, meat and eggs of indigenous birds can meet the demand in a growing niche market.

High expectations So why have governments and NGOs supported the introduction of improved poultry breeds in rural areas? For the masses of deprived, marginal and landless farmers in these areas, poultry serves as both a safety net and a means to acquire assets and move out of poverty. If hybrids are reared under the right husbandry conditions, they give a higher yield in terms of both eggs and meat than indigenous breeds, but they do not hatch chicks. Experience has shown, however, that without the adequate infrastructure it is rarely cost-effective for small-scale farmers to raise improved birds. Two practices in rural India show how the introduction of simple, low-cost methods can easily enhance the contributions that indigenous birds make to farmers' livelihoods, without having to invest in costly new institutional and market frameworks.



Reviving the Aseel breed The Aseel is one of the most widespread indigenous chicken breeds in Andhra Pradesh, India, and has an ancestry steeped in antiquity. Traditionally, they are kept for their cock-fighting abilities and their relevance in social and religious functions – and that's in addition to the superior taste and texture of their meat. They are usually kept by women and sell at prices 50 to 100 percent higher per kg/live weight than broilers. However, in the early 1990s infectious diseases like Newcastle disease (a highly contagious viral disease affects poultry of all ages and can severely threaten farmers' livelihoods) became widespread among the breed and started to threaten its gene pool. State policies to introduce non-local breeds failed and in 1994 a consortium of NGOs led by the Indian organisation Anthra looked into ways of promoting the on-site conservation of Aseel poultry. They studied backyard production methods employed by some 2,000 households in 24 villages in East Godavari and developed improvements based on traditional technologies and institutions that were already in place. These included training local animal-health workers to provide basic, yet critical services to poultry farmers, and revitalising the traditional vaata sharing system (see box) to increase poultry ownership. The female poultry farmers found that reverting to growing pulses and traditional staples such as millet and paddy instead of cash crops not only increased household food security, but also offered a rich scavenging base for the poultry, with a positive effect on their income. This change in cropping enabled each household to maintain a flock of up to 25 birds.

And, as the women's groups grew in numbers and strength, they managed to get the government's Animal Husbandry Department to vaccinate their birds free of charge; as a result of these local efforts, mortality rates in the Aseel population shrank from 70 percent to 25 percent between 1996 and 2008 and, over the same period, the net income from one bird, including the value of both eggs and offspring, rose from 1,800 to 5,750 rupees (US\$ 40 to US\$ 130).

Re-inventing the Kadaknath

Similarly, efforts focused on the Kadaknath – another indigenous breed of chicken found largely in the Jhabua district of Madhya Pradesh – have paid off. The dark-coloured meat of the Kadaknath bird is considered a delicacy and consumers are willing to pay a premium for it. However, excessive consumption combined with the introduction of improved breeds such as the Rhode Island Red and recurrent outbreaks of Newcastle disease were diluting the Kadaknath gene pool and numbers plummeted in the late 1990s. Since 2003, a government programme has been running in tribal areas of Madhya Pradesh to enhance livelihoods of village communities. Prompted by a suggestion by local farmers, the Madhya Pradesh Rural Livelihoods Project (MPRLP) introduced the Kadaknath birds in new areas to support and strengthen local livelihoods. The MPRLP, in conjunction with village assemblies and BAIF, a local NGO, has facilitated the distribution of batches of 100 Kadaknath chicks, bought from the government hatchery involved in conserving this poultry stock. The carefully selected beneficiaries have received poultry farming training and obtained access to a variety of government programmes to finance the inputs. This led to unnecessary high initial investment on sophisticated poultry houses, special equipment and compound feed, as per experts ill' founded advice. But through experience it was learnt that the breed has a high feed conversion rate and thrives well under (semi)scavenging conditions. In addition, vaccination, deworming and first aid were provided by animal-health workers linked to BAIF. And while Kadaknath hens are sold in local markets, the popular birds are often purchased directly from the farm, reducing transaction costs for farmers. Rearing the indigenous Kadaknaths has increased annual net income from both eggs and offspring to an estimated 5,300 rupees (US\$ 120) per bird, compared to less than 1,200 rupees (US\$ 28) for other, ordinary native species. Currently, households have also taken up rearing Kadaknaths in scavenging systems themselves, typically in conjunction with few local hens that are good brooders, which Kadaknath hens aren't. Another plus for the Kadaknath is that they are vital in certain religious ceremonies.

Affordable healthcare is crucial

The two cases show that only small interventions are needed to revive and strengthen self-sustainable smallholder poultry practices that use indigenous breeds. There is no need to revolutionise prevailing husbandry practices or to make use of costly housing and equipment or to introduce day-old chicks or buy special feed. What is critical however is the provision of affordable animal health services for farmers, including the timely vaccination of chicks. Another important aspect concerns the diversity of the farming

The Aseel revival: the vaata sharing system

In 2000, ten women in Noogamamidi, Andhra Pradesh, were each given two Aseel hens, the rest of the group were given two Aseel cocks. They collectively returned 25 five-month-old chicks, which were then passed on to other women in the village who did not have any poultry. A year later 55 chicks had been produced, and, since there were no further takers in the village, the group decided to sell the birds, for which they received 2,890 rupees (US\$ 75). In 2003, eight birds were passed on to eight women in another village, and three years later more birds were given to women in two other villages. Over the past eight years, 74 women in six villages have benefited from the scheme.

system; the more diverse the farm, the better the scavenging material. The Aseel case shows that female farmers can easily modify their own traditional farming and poultry distribution system. In the case of the Kadaknath birds, it was necessary to "learn by doing" before realising that these birds could best be kept in the way tradition had taught. Both cases show that governments would do well to stop distributing commercial hybrids, albeit for free, and focus on the provision of public services such as the prevention and control of (zoonotic) diseases. Communities themselves, and the private sector (or a public/private partnership), can be relied on to supply, for example, day-old chicks. Indeed, two pioneering companies in India are doing well out of selling two other indigenous species, the Kuroiler and Sadpuda, that are well adapted to the often harsh living conditions that exist in poor, rural communities. In their business strategies, both companies successfully targeted poor households.

A gift for society at large This evidence from India suggests that indigenous poultry, normally handled by women, can significantly contribute to farmers' livelihoods through increased food security and cash income. While the returns from rearing just a few indigenous birds may not be sufficient to fully sustain a family, they will serve to generate highly nutritious food at minimal cost. In addition, these practices bestow dignity and respect on the family, which can offer an egg or the slaughter of a bird for its guests. The contribution that such practices make to heritage and cultural conservation can be regarded as a gift for society at large.

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Indigenous breeds are always profitable than cross breeds

Livestock is a very important component for profitable farming as most of the agricultural by-products can be used to feed them converting them into manure immediately. Other economical gains are in the form of wool, milk, egg, meat and skin. In India, very good draught animals like bullocks and he buffaloes can be freely obtained for cultivation. Agriculture is not growing a crop only, it is an integrated system of tree cropping, animal husbandry, crop cultivation, and other allied activities. Particularly, in dry farming system, the farming family is engaged only for 80 to 85 days. The rest of the year i.e., for about 280 days the farmers waste their time in visiting friends and relatives spending money. If farmers don't have animals on the farm, they have to sell away their hay and waste most of their by-products and lose a lot of bio-mass. It is the most important thing to retain as much biomass as possible on the farm to increase soil carbon in the farm land.

In Indian agriculture system, cattle were an integral part and were treated as members of the family. People held them in their living houses and cared for them like any other family member. There were more than 70 breeds in our country, 3 or 4 strains in each ecological zone right from the smallest "Malenadu gidda" (Western Ghats dwarf) to the giant strains like Tharparkar, Devani, Ongole, suitable for the local weather and soils. In the plains, we had Hallikar, Amruthamahar, Krishna Valley, Baragur, Punganur, Kangaayam and Vechur in Kerala. They were adapted and able to withstand heat, cold and rain and fed on locally available vegetation. They have a big hump and a vast piece of skin hanging under the neck and a lot of sweat glands to discharge excessive heat from their bodies. They have a long tail with long hair that could move upto 360°, so that they can chase away flies and mosquitoes biting them. They have developed immunity against many diseases like foot and mouth disease as they have very small foot with a very narrow gap in between their hoofs, compared to the cross breed cattle which have a very big and wide gap between their hooves.

Since the local breed cattle are used to our tropical weather and locally available fodder, their maintenance is cheaper. But farmers were misguided about higher milk yields and profits. Particularly, during the past 10 years, dairy farmers are loosing Rs. 5/- on each litre of milk they sell, since the cost of each input like fodder, concentrates, medication and the cost of milch cows have virtually doubled. Actually milk is not necessarily a human food. In India, we were confined to using buttermilk and ghee only. Unfortunately, the British medical science taught us to depend on animal proteins. At the same time when Scandinavian countries, particularly Holland and Denmark had hills of skimmed milk and fat oil stocks

unsold, they got in to India to sell them. Their bulls that were slaughtered for beef were sold at a premium price for cross breeding Indian cows. That is how they were imposed on innocent rural farmers inducing them to produce milk for urbanities



for their luxurious life styles of consuming coffee, tea, curd, butter, kova, cheese, milkshakes, chocolates and paneer etc., and various sweets made out of milk and its products. In the name of nutrition they consume them and suffer from obesity. Most of the times when I think of nutritional sciences, I feel that they are very well manipulated to provide a good business for medical industries in the name of health services.

The other face of the tragedy with crossbreed cows is that the male calves have to be sold as soon as they are born, because they cannot be used as bullocks for cultivation and transport. They do not have hump to hold the yoke to pull the plough and cart. They are unable to work in the hot sun of our country, hence no farmer wants to bring them up. Usually any animal gives birth to 50% of male and 50% female calves. Hence there is a huge loss by selling male calves of cross breed cows. This is how dairy farmers incur huge losses by selling away their male calves to butchers. Where as in the case of any indigenous male calves they bring them up and use as bullocks for cultivation and the excess are sold between Rs. 10,000 and Rs. 50,000 and make a huge profit.

Cow is not just a machine to produce milk with concentrated enzymes and medication. It should provide cowdung, urine, for fertilizing the land to produce healthy food and provide beneficial bullocks for cultivation. These days cow urine is found to be very useful in curing many diseases including cancer. The research station on cattle at Nagpur has come out with many beneficial products like soap, ointment for colds, phenyl, distilled cow urine as medicine, mosquito repellents and so on. Hence, it is very important and urgent to save indigenous cattle from extinction for the welfare of the country. During 1990 when U S S R collapsed and many Western countries imposed banning supplies to Cuba, particularly chemical fertilisers, the Cuban government banned cow slaughtering to come out of fertiliser scarcity and very soon they produced enough compost. The whole world should learn a lesson from a non Hindu community country to ban cow slaughtering to save soil and its productivity.

Shri Narayana Reddy is a legendary organic farmer and is one of the most sought after resource persons on ecological agriculture.

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The state of food and agriculture 2009: Livestock in the balance
By FAO, Published by FAO. Website: www.earthprint.com/productfocus.php?id=FAO110188 2010, 176pp, ISBN 978 9 25106 215 9(Pb) US\$75

Livestock support the livelihoods and food security of a billion people. But in many countries, the absence of strong governance and regulation, coupled with rapidly rising demand for meat and other livestock products, is increasing the risks of disease and the pressure on land, water and biodiversity. Tackling the links between livestock, food security and poverty reduction, climate change, and diseases, *The state of food and agriculture 2009*, FAO's annual flagship publication, argues that while the livestock sector must continue to meet rising world demand, "it must do so in an environmentally sustainable way, while managing the incidence and consequences of animal diseases and providing opportunities for rural development, poverty reduction and food security."

Growing international trade, inadequate access to veterinary services, and concentration of livestock near urban populations has increased the risk of animal disease outbreaks and the emergence of new animal-related threats to human-health, such as H1N1 and SARS. "Meanwhile," the report adds, "climate change is altering patterns of livestock disease incidence, as pathogens and the insects and other vectors that carry them enter new ecological zones". Improving early warning systems for disease outbreaks by involving animal health workers, and strengthening national and international animal health and food safety systems are among the recommendations made.

To meet the challenges and constraints highlighted, this comprehensive publication calls for appropriate institutions, research, development interventions and governance that reflect the diversity within the sector and the multiple demands placed on it. "The issue of governance is central," says Jacques Diouf, FAO director general in the foreword. "Identifying and defining the appropriate role of government, in its broadest sense, is the cornerstone on which future development of the livestock sector must build."

Entrepreneurship in Livestock and Agriculture Edited by M.C. Sharma, Rupasi Tiwari and J.P. Sharma, CBS Pub, 2010, pbk, xvi, 484 p, tables, figs, ISBN : 81-239-1774-0, Rs. 395.00

"Provides comprehensive information on the basics of entrepreneurship, related concepts, communication acumen, interpersonal communication strategies, agribusiness ventures, WTO and IPR issues, banking and insurance facilities and various other aspects related to the promotion of livestock enterprises, especially in the rural areas. Based on the syllabus of newly formulated course for students of veterinary and agriculture sciences, it aims to serve as a textbook to the students and as a handbook to the professionals in the field of livestock and agriculture sciences, motivating them to set up their own economically viable enterprises, reducing the burden on the government as well. The book is also relevant for the policy planners, executors at field level, researchers, academicians and students, and entrepreneurs to provide them fresh thought on the avenues in the present era of shrinking landholding and increasing unemployment in rural areas and agribusiness and micro enterprise promotion."

Supporting livelihoods and local livestock breeds – Guidelines for putting Livestock Keepers' Rights into practice. LIFE Network, March 2010. Document available at <http://www.pastoralpeoples.org/>

Rights, a concept born out of the recognition that livestock-keeping communities have played a crucial role in the development of most of the world's local breeds and continue to be the custodians of these breeds; and livestock biodiversity, ecosystems and livestock-keeping communities are interdependent.

The concept was developed and refined in a series of consultations that took place on three continents, with hundreds of livestock keepers from 20 countries over the last seven years. The outcome was a Declaration on Livestock Keepers' Rights, presenting three principles and five rights that would enable and encourage livestock keeping communities and pastoral and small-scale livestock keepers to continue keeping their breeds and making a living from them. The Declaration also list legal frameworks backing *Livestock Keepers' Rights*. These guidelines are long overdue. They are urgently needed to counteract the rapid loss of livestock breeds and to support rural livelihoods. Only if ecologically responsible, livestock keepers receive sufficient recognition and support will it be possible to conserve breeds, livelihoods and the environment in marginal areas. It is hoped that all those involved in livestock research and development will recognize and follow these guidelines to make Livestock Keepers' Rights a reality.

Adding value to livestock diversity – Marketing to promote local breeds and improve livelihoods LPP, LIFE Network, IUCN–WISP and FAO. 2010. FAO Animal Production and Health Paper. No. 168. Rome. Document available at <http://www.pastoralpeoples.org/>

Many local livestock breeds and minor species are in decline and may be lost because they cannot compete with high-yielding exotic breeds. Conserving these breeds is important: many have unique traits, such as hardiness and disease resistance, that are vital for future livestock production. One way to help ensure their survival may be to sell products from these breeds to high-value, specialist markets.

The Global Plan of Action for Animal Genetic Resources acknowledges the importance of market access to the sustainable use of livestock diversity and calls for development of markets for products derived from local species and breeds, and for strengthening processes that add value to their products.

This publication describes eight examples of marketing of livestock products (wool, cashmere, milk, meat and hides) from local breeds of Bactrian camels, dromedaries, goats and sheep in seven countries in Africa, Asia and Latin America. It shows how they have kept local breeds in use, while enabling the small-scale livestock keepers and pastoralists who raise them to improve their livelihoods.

LPP, LIFE Network, IUCN–WISP and FAO. 2010. Adding value to livestock diversity – Marketing to promote local breeds and improve livelihoods. *FAO Animal Production and Health Paper 168*. Rome.

Rainfed Agriculture in India – Perspectives & Challenges By Surjit Singh, Director, IDS, Jaipur & M S Rathore, Ex-Professor, IDS Jaipur. Published May 2010. Hardback. Price: Rs 775.00. Source: www.booksfordevelopment.org

India's agriculture growth after independence has moved the country from the severe food crisis of the sixties to aggregate food surplus today and rainfed agriculture has played an important role in this. In India about two-third of total net sown area comes under rainfed lands. Rainfed crops account for 48 per cent area under food crops and 68 per cent under non-food crops. One of the major challenges facing rainfed agriculture in India today is its sustainable development through conserving and enhancing the inherent capacity of its land and other natural resources to sustain it. Any erosion of this capacity will threaten country's food security and agriculture substantially. In order to constantly address this concern, along with increasing production of food grains and other agricultural products, it is necessary to enhance and conserve the stock of available land, water and other natural resources and develop improved technologies, which maintain and improve the productive capacity of natural resources. This book focuses on important aspects relating to rainfed agriculture such as crop husbandry, conserving land and water, livestock development, livelihood options in rural non-farm sector and policies, initiatives and institutional changes necessary for rejuvenating rainfed agriculture. The analysis and issues raised in the book would go a long way to put the much-neglected agriculture in rainfed areas in true perspective and provide space for better policy options.

State of India's Livelihood Report 2009 By The Livelihood School, 2009. 190 Pages. PB. Price: INR 750.00. Source: www.booksfordevelopment.org

This report is a one of its kind report and is the only document that aggregates the experiences and challenges of the livelihoods sector, analyses case studies, and reports the progress of both government and privately run programs. It focuses on the 4 Ps - people, policy, promoters and possibilities. It is an annual publication with specific themes each year addressing contemporary issues impacting livelihoods. The report also focuses on livelihoods practitioners as core audience with usability to other stakeholders like policy makers, academics, others like CAB, BIRD etc. Keeping the core audience in mind, the report would be more focused on providing practical learnings, live examples and case-studies and analysis of different models and innovations that can be adapted to various livelihoods interventions. To tie the chapters together, a uniform 4-P (people, policy, promoters and possibilities) framework is used for each chapter.

EcoFeminism By Maria Mies & Vandana Shiva. Published in 2010. H.B. 336 pages. Price: Rs. 795. Source: www.booksfordevelopment.org

Maria Mies and Vandana Shiva, internationally respected feminist activists and writers, come together in this book on a controversial environmental agenda. Using interview material, they bring together women's perspectives from North and South on environmental deterioration and develop a new way of approaching this body of knowledge, which is at once practical and philosophical. Do women involved in environmental movements see a link between patriarchy and ecological degradation? What are the links between global militarism and the destruction of nature? In exploring such questions, the authors criticize prevailing theories and develop an intellectually rigorous ecofeminist perspective rooted in the needs of everyday life.

They argue for the acceptance of limits, the rejection of the commoditization of needs, and a commitment to a new ethics.

Farmer First Revisited – Innovation for Agricultural Research and Development. Edited by Ian Scoones and John Thompson with a foreword by Robert Chambers. 369 pages, 234 x 156mm, Paperback, ISBN 9781853396823

Agriculture is an urgent global priority and farmers find themselves in the front line of some of the world's most pressing issues- climate change, globalization and food security. Twenty years ago, the Farmer First workshop held at the Institute of Development Studies, University of Sussex, UK, launched a movement to encourage farmer participation in agricultural research and development (R & D), responding to farmers' needs in complex, diverse, risk-prone environments, and promoting sustainable livelihoods and agriculture. Since that time, methodological, institutional and policy experiments have unfolded around the world. Farmer First Revisited returns to the debates about farmer participation in agricultural R & D and looks to the future. With over 60 contributions from across the world, the book presents a range of experiences that highlight the importance of going beyond a focus on the farm to a wider innovation system, including market interactions as well as the wider institutional and policy environment. If, however, farmers are really to be put first, a politics of demand is required in order to shape the direction of these innovative systems. This is a call for a major rethinking of agricultural R & D, the boosting of the knowledge and capacities of farmers' organizations to innovate, the strengthening of networks and alliances to support, document and share lessons on farmer-led innovation, and the transformation of agricultural higher education.

Seed Quality Enhancement - Principles and Practices by K Vanangamudi, S Kalaivani, Mallika Vanangamudi, G Sasthri, A Selvakumari, P Srimathi Published by Scientific Publishers (India). Website : www.scientificpub.com, 2010, 484pp, ISBN : 978-81-7233-663-9, Price: Rs. 2250.

Quality seed is the key for successful agriculture. The farmers are always very much interested in the best seed management practices which are safe, environmentally sound and scientifically proven technologies. Since seed is a biological entity, deterioration beyond harvest is inevitable. The consequences of low quality seeds are poor germination, low and delayed emergence and weak growth leading to poor field stand and ultimately reflecting on reduced yield. Low productivity could be attributed broadly to use of poor quality seeds. At present to overcome this, several seed enhancement techniques are available for quality upgradation. It has two goals; one is related to seed designing and other to seed functioning.

Several physical, physiological and biochemical treatments are available at present to give value addition to seeds. Physiological seed treatments that improve seed performance are based primarily on seed hydration and dehydration. Among several non physiological seed treatments, coating or pelleting can also indirectly improve seed germination, stand establishment and crop productivity.

Keeping in view the importance of quality seed and its value addition, this book entitled "Seed quality enhancement: Principles and practices" has been prepared with expertise of seed scientists. The authors of various chapters have made a remarkable job of writing the chapters in a fitting manner.



Livestock keepers rights and biocultural protocols

Tools for protecting biodiversity and the livelihoods of the poor

Ilse Köhler-Rollefson, P Vivekanandan and H S Rathore

The development of Livestock Keepers Rights and the Biocultural Protocols will be important tools in supporting the livelihoods of livestock keeping communities and the survival of the biodiversity they have managed over centuries.



Traditional livestock keeping in India is based on access to common property resources. The Institution of *gochar* or village grazing ground is an ancient one that dates back several thousand years. In addition to the *gochar*, there are grazing areas under protection of a temple, called *oran* or *devbani*, and in pre-colonial times, many communities enjoyed grazing privileges in the forests.

However, as we all know, the availability of such common property resources is drastically decreasing, not only in India, but throughout the world. This has at least two devastating consequences: first, it impacts the livelihoods of pastoralists and of smallholders who have to give up keeping livestock and are then forced to seek wage labour in urban areas. Secondly, the breeds of livestock that were kept by these people disintegrate and finally become extinct. This latter development of vanishing local livestock breeds is of great concern for future food security because it makes us dependent on a handful of genetically narrow high performance breeds. In order to address the issue, the global community has agreed on the “Global Plan of Action for Animal Genetic Resources” (GPA) in September 2007 whose implementation is guided by the Food and Agriculture Organisation (FAO).

The GPA was arrived at after a long process of government discussions that extended over many years and was dominated by scientists. Throughout this process, civil society organizations had emphasized that local livestock breeds could not be conserved *ex-situ*, i.e. outside the production system in which they had been developed, because this would lead to the disappearance of their adaptive traits and not prevent the loss of the traditional knowledge systems in which they are embedded. In an extensive series of consultation with pastoralists and other traditional livestock keepers a set of “Livestock Keepers Rights” was developed that would enable traditional livestock Keepers to continue acting as stewards of their breeds. These rights are composed of three principles and 5 specific rights and actually are already mostly covered by existing international and national legal frameworks and laws.

Principles:

1. Livestock Keepers are creators of breeds and custodians of animal genetic resources for food and agriculture.
2. Livestock Keepers and the sustainable use of traditional breeds are dependent on the conservation of their respective ecosystems.
3. Traditional breeds represent collective property, products of indigenous knowledge and cultural expression of Livestock Keepers.

Livestock keepers have the right to:

1. Make breeding decisions and breed the breeds they maintain.
2. Participate in policy formulation and implementation processes on animal genetic resources for food and agriculture.
3. Appropriate training and capacity building and equal access to relevant services enabling and supporting them to raise livestock and to better process and market their products.
4. Participate in the identification of research needs and research design with respect to their genetic resources, as is mandated by the principle of Prior Informed Consent.
5. Effectively access information on issues related to their local breeds and livestock diversity.

The three principles and 5 rights were compiled into a “Declaration on Livestock Keepers Rights” which references them to existing legal frameworks. The Declaration also clarifies the term “livestock keeper”, breaking it down into two specific groups: *Indigenous livestock keepers* representing those communities who have a long-standing cultural association with their livestock and have developed their breeds in interaction with a specific territory or landscape and *ecological livestock keepers* as those that sustain their animals and the environments, where these animals live; relying largely on natural vegetation or home-grown fodder and crop by-products and without artificial feed additives.

While some governments, especially from Africa, have shown interest in adopting Livestock Keepers Rights, Western policy makers have remained rather skeptical and resisted including Livestock Keepers Rights in the Global Plan of Action for Animal Genetic Resources.

Out of this situation, another approach was born to invoke the rights of livestock keepers for in-situ conservation of their breeds: *Biocultural Community Protocols*. Such protocols are the outcome of a facilitated process in which a community reflects about and puts on record its role in the management of biological diversity, not only its livestock breeds, but also its contribution to general eco-system management. In addition, and maybe even more importantly, the community is also made aware of existing national and international laws – such as the Convention on Biological Diversity (CBD) – that underpin the right to in-situ conservation. So far two pastoralist communities in India have developed biocultural community protocols: the Raika of Rajasthan who steward the camel, Nari cattle, Marwari goat and a number of sheep breeds, and the Lingayat of Tamil Nadu who have developed the Bargur cattle breed. In both cases, it has been an empowering experience and a number of other communities have expressed interest in following suit. If the process expands, the relationship between communities and breeds will become much more visible, hopefully convincing the government which has been supporting ex-situ conservation by deep-freezing sperm or keeping breeds in government farms so far instead come forward in favour of community-based conservation.

In October 2010, governments will meet in Nagoya (Japan) to discuss progress in the implementation of the United Nations Convention on Biological Diversity. They will also negotiate and hopefully agree upon an International Regime on Access and Benefit-sharing (IRABS). The current draft text for IRABS acknowledges the significance of community protocols for exercising rights over their resources by people practicing

traditional lifestyles. It is in the interest of traditional livestock keeping communities, as well as all other groups that conserve biodiversity that IRABS with strong references to biocultural community protocols will be adopted by the parties to the Convention on Biological Diversity. This will be a strong tool supporting the livelihoods of livestock keeping communities and the survival of the bio-diversity they have managed often over centuries.

In a recent on-line discussion hosted by the FAO's Global Forum on Food Security and Nutrition (FSN Forum), the majority of participants supported Livestock Keepers Rights as a tool for food security.

The Declaration on Livestock Keepers Rights is open to signature and available on the website of the League for Pastoral Peoples and Endogenous Livestock Development (LPP) which also features practical guidelines for implementing the Livestock Keepers Rights approach into practice.

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www.leisaindia.org

A website for learning and sharing experiences on LEISA practices.

Main features

- Space to share your LEISA experience.
- A source for LEISA practices followed by farmers.
- An archive of LEISA India magazines - English edition and regional editions (Tamil, Kannada, Hindi). LEISA India in Oriya and Telugu will be available shortly.
- Photos and videos on LEISA practices.
- Interesting cases of people following LEISA practices.

The screenshot shows the LEISA India website interface. At the top, it says 'LEISA India' and 'LEISA is about Low external input and sustainable agriculture'. Below this, there's a navigation menu on the left with items like Home, Features, Impact, Archives, Videos/Photos, Subscription, and Contact Us. The main content area is divided into several sections: 'Magazines' with options for English Language and Regional Language; 'Fact Sheet' providing information about the magazine; 'Services' listing various support activities; 'Feedback' with a form; and 'Farmer's Dairy' featuring photos and videos. A search bar and a 'Make your donation today' button are also visible.