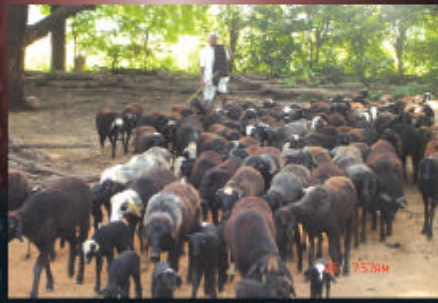
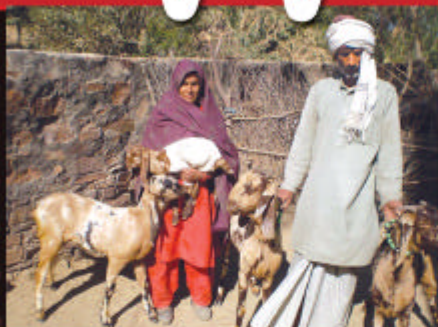


Bridging the Knowledge Divide



LIVESTOCK
LIVELIHOOD
RESOURCES
IN THE EMERGING
CONTEXT



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LIVESTOCK
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ANTHRA started by team of women veterinarians in 1992, is a resource, training, research and advocacy centre for bio-diversity based livestock production. Anthra works on issues pertaining to livestock, people's livelihoods and natural resources with a clear emphasis on gender and equity concerns.

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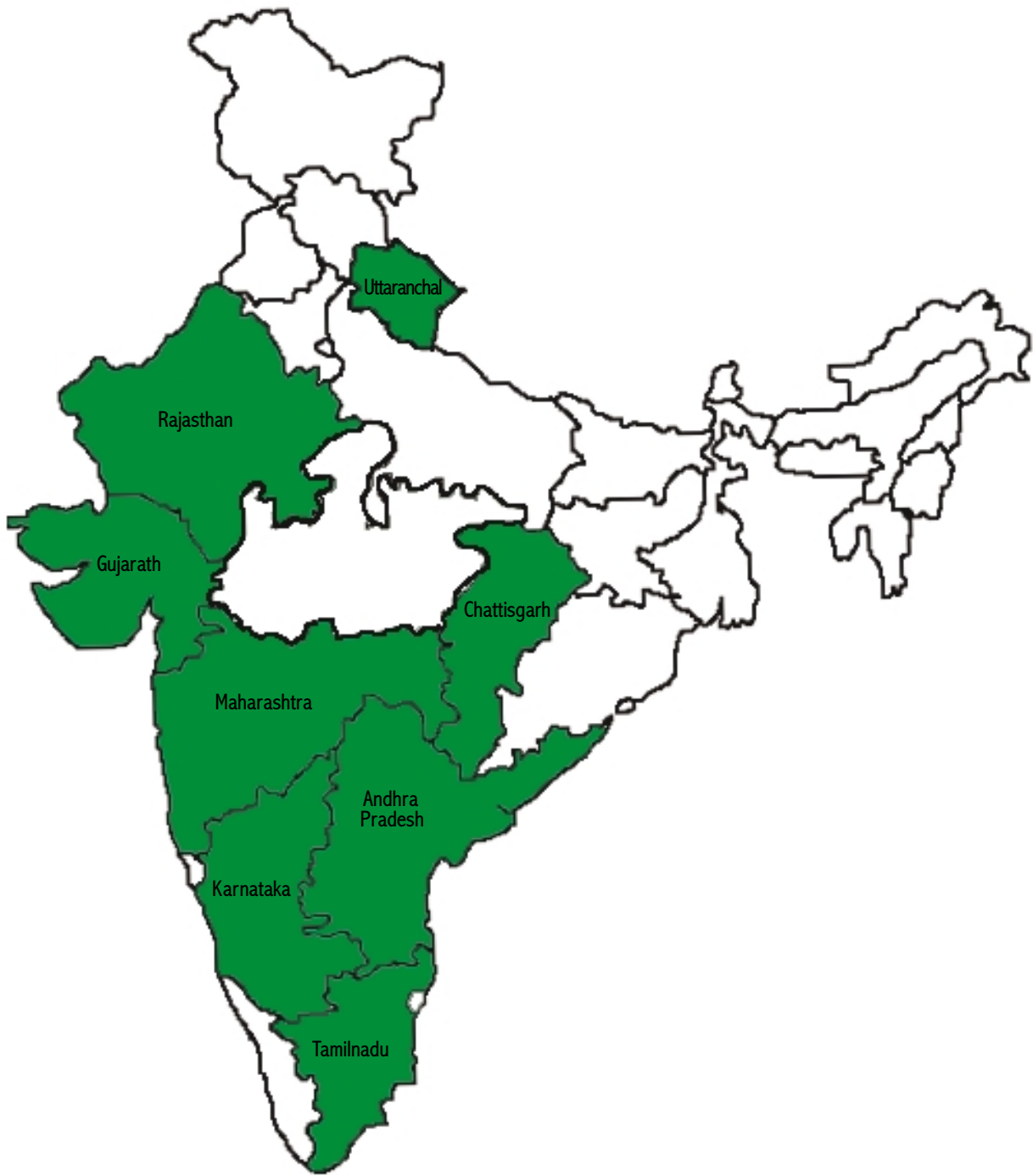
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Uttaranchal

Rajasthan

Gujarath

Chattisgarh

Maharashtra

Andhra Pradesh

Karnataka

Tamilnadu

I n t r o d u c t i o n

The Problem Context

A large portion of rural Indians derive their livelihood from livestock and livestock rearing activities. Women play a key role and constitute 71% of the labour force. Unlike agriculture, livestock rearing is also substantially practiced by pastoral and non pastoral nomadic groups who form 7% of the countries population. India also boasts of the largest bovine and small ruminant population in the world. Livestock rearing assumes considerable importance in over 66% of India which falls under arid-semi arid agro-ecological conditions. Communities here are dependant on rain fed, dry land agriculture, and drought is a recurring feature. Livestock rearing forms a major component of their livelihood. Mixed crop-livestock farming and pastoralism are the two common production systems in these areas. In the former, farmers derive their livelihood somewhat equally from agriculture and livestock and in the latter people's livelihoods depend more or less completely upon their livestock, which are almost exclusively maintained on grazing under migratory or semi – migratory conditions.

Predominant development approaches towards agriculture and livestock have often been critical of these production systems categorizing them as inefficient. Just as the green revolution approach to agriculture sought to change the face of traditional Indian agriculture, likewise for a number of years now the mainstream approach to livestock development has been towards changing livestock production systems starting with livestock breeds, livestock nutrition, health care and marketing. While India can boast of some success stories, the dismal truth in a large part of the country is breakdown of traditional systems, loss of breeds, inability of research to respond to the problems of marginalized farming communities, and ultimately the crumbling of fragile livelihoods dependant on livestock resources.

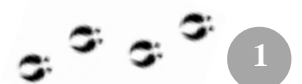
As a result, some of the most visible changes are:

Change in livestock production systems

Programs and Policies are pushing farmers to shift from low input systems of production, to capital intensive high input systems. Most poor farmers cannot cope with these changes, and end up being pushed out of livestock rearing completely.

Change in livestock breeds: species and composition

Livestock Policies and Plans have been directed at upgrading local stock to high producing varieties or replacing indigenous breeds completely. The two critical effects have been that the high producing breeds make greater demands on resources, fodder, water, labour and capital as well as are more demanding in terms of health care, and secondly there has been rapid disappearance of indigenous breeds and the associated genetic material. Should farmers wish to restock with indigenous



breeds, there are practically no agencies that give farmers loans to do so, and of equal concern is the rapid erosion of quality animals of indigenous stock.

Change in the fodder base

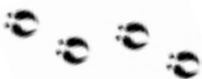
Agriculture policies set into motion in the late sixties and seventies, have succeeded in massive replacement of food grain crops by non-food cash crops, as also local crop varieties with high yielding varieties, resulting in acute decline in diversity of crop residues and other by-products that traditionally formed a crucial part of the diet of animals/ poultry, particularly in the summer months. Simultaneously contract farming arrangements by the poultry industry with small farmers, is resulting in commercial maize for poultry feed being cultivated on lands that once grew food for humans, all of which have far reaching implications on the countries food security. On the other hand, the rapid disappearance of commons, pasture lands and forests which traditionally nurtured and nourished our livestock has led to a compounding fodder crisis. All this has resulted in forcing farmers to sell stock or feed their animals on material unfit for consumption such as genetically modified crops like Bt Cotton, or parthenium (congress grass) or lantana . This in turn leads to unexpected disease conditions compromising both livestock health as well as the health of humans who consume these livestock and their products. The seasonal shortage of drinking water is a related facet that compromises the health and productivity of livestock.

Declining livestock health

The shrinking fodder base coupled with climate change has had unexpected effects on livestock health. Emerging diseases like Blue Tongue and Peste des petits ruminants (PPR) in sheep have in the recent past, decimated small ruminant populations across the country. The impending threats of Avian flu are somewhat more publicly known. Poisoning of stock after consuming Bt Cotton, pesticide sprayed crops and weeds, are posing new threats to the livestock population which the veterinary community is presently ill equipped to deal with. Simultaneously the attempts to privatise veterinary health services and include para-professionals with limited understanding of emerging problems is creating situations which are in fact a problem for public health .

Globalisation and changing markets

While India's cooperative milk marketing successes are well known, economic reforms and liberalization of agriculture markets including dairying, initiated by the Indian state in the 1990s, has proved to be a massive disaster for millions of small farmers, whose commodities are competing with highly subsidized agriculture goods flooding India's markets from US, EU and Australia. Rising input costs coupled with falling or stagnating prices along with the withdrawal of all support prices and subsidies from the state, has become a huge burden for small and marginal farmers and resulted in pushing several farmers out of dairying.



The 59th round of the National Sample Survey (NSSO) reports of 2002-03¹, reveal that the average in-milk bovine stock owned per 100 rural landless households fell from 16 in 1971-72 to just 1 in 2002-03. During the same period there was an overall decrease of in-milk bovine stock per 100 rural households which fell from 54 to 36. Competition from international players, multinational corporations and large private agri- business units threaten to wipe out small producers. India's inability to meet global standards of production especially in terms of health of livestock and quality of livestock products may compound the problem. Already poultry contract farmers are reeling under the stress of having to absorb the losses which are experienced by poultry transnational /national corporations, in a highly volatile global markets. New markets for bio-fuels, and the recently passed biofuel policy in India, which target India's so-called wastelands, have several implications for livestock and food-security which continue to be under-explored/understood.

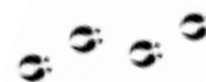
Declining livestock assets amongst the poor, marginal and small farmers

While the livestock economy penetrates sections of rural society both vertically and laterally, supposedly more equitably than land holdings, a matter of growing concern is that despite 70% of India's livestock being owned by landless, marginal and small farmers, recent studies across India, including NSSO surveys, indicate that over half of all these households are 'non-livestock owners', challenging the well entrenched notions of livestock being more equitably distributed than land.

Growing divide between formal science and the community

Unfortunately there is little sensitized exchange between marginalized livestock rearing communities, the scientific community and the state department which is responsible for animal husbandry or development. As many of these problems also lie in the interface of agriculture, forestry, commodities and trade and health there is also a need for discussion across disciplines. Research in universities often has contentious relevance to ground realities, rarely benefiting the needs of poor communities. Many scientists within the research institutions and the animal husbandry departments have begun to unquestioningly accept certain paradigms and processes evolving in the research, development and extension fields as "givens" not to be questioned and end up conducting research within these pre-set boundaries that have been drawn up by the state. For instance an acceptance that there is no way forward but to privatise the veterinary services, due to lack of public (state) resources, persuades them to carry out research within the framework of a privatised veterinary healthcare delivery system. Similarly a narrow understanding that improved production in animals equates higher milk yields, makes several scientists reluctant to research on indigenous breeds

¹ NSSO Reports (215, 338, 408, 493)



to analyse the science behind peoples increasing preference for the latter, and limits research to ways to make the crossbred work. A critical aspect of sustainable agriculture, safe food production and food sovereignty in India lies in restoring our livestock wealth, in ways which will give farmers control over their food production. While there are several initiatives being made with the objective of revitalizing dryland agriculture / ecological agriculture, there is still a huge gap at various levels in terms of perspectives, skills, practice and policy for addressing livestock concerns within the larger efforts of building an environment for farmers to farm in ways that will build food, fodder and livelihood sovereignty.

Anthra has over the past 15 years, been consistently working on cutting edge issues related to livestock, people's livelihoods and natural resources, with a clear emphasis on gender and equity concerns. We have been working with different livestock rearing communities across India helping them to innovate with practical solutions to the multiple problems they face rearing livestock. A strong research focus is used to develop and evolve these interventions. The latter has additionally been the basis for a productive out-reach program to other organisations through training, technical support and publications. This unique approach has also become the basis for strong advocacy with policy makers.

Over the years, there have been several useful experiences innovated by communities with whom we have worked, in different agro-ecological contexts, which provide concrete direction and articulation of "What can and needs to be done".

These experiences challenge the standard recommendations for livestock development which are routinely made by both the government as well as development and Aid agencies:

- Breed improvement through cross breeding or upgrading with exotic animals
- Support to dairy programmes
- Recommending stall feeding and growing irrigated fodder
- Veterinary care to be met exclusively by private para-professionals with only "facilitative role" by the public veterinary institutions

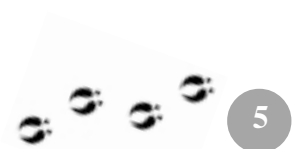
While the latter do well if the farmer lives in a flat irrigated belt, possessing sufficient land, water, labour and capital resources, they fail quite miserably, if the tract is hilly ,undulating and rain fed and the livestock keeper belongs to one of the several marginalized and resource-scarce communities- adivasi, dalits , agro pastoralists and pastoralists. A woman from these communities stands to loose the most- particularly if she is landless, with limited access to formal veterinary care and completely dependent on natural resources such as village grazing lands and forests for sustaining her animals.

This collection of case studies captures the struggles and experiences of groups who have done something different from the recommended. They are located in varied states across the country, and while fairly representative of the countries diversity, by no means exhaustive. They are important because most of the people who have made it happen are not famous scientists or known leaders but ordinary people whose vision has been different from the mainstream. Anthra has worked closely with many of the groups, the extent and duration of our association has been varied. Some of the organisations are well known nationally .Yet others are relatively unknown. Some of these experiences have been in practice for a number of years, yet others are fledgling initiatives and still need to be nurtured. Therefore the length of each study is quite different and the content is also represented differently.

The case studies are grouped thematically into the following

- Livestock, Agriculture and Rural Livelihoods
- Indigenous Livestock and Poultry Breeds
- Livestock, Landuse and the Environment
- Livestock Health, Nutrition and Management

We believe that this becomes a starting point for reflection, discussion and debate, where communities can present their vision of livestock development based on solid practice, to scientists, researchers and policy makers so as to build the knowledge gap /divide that has emerged between policy and peoples needs. We hope this will sensitize the former to transform research, policies and practice to respond to the genuine problems and needs of marginalized farming communities. We believe these experiences would also provide pointers to others who are looking for concrete alternatives to mainstream development paradigms.



Livestock, Agriculture and Rural Livelihoods



Yes We Can! Dalit Women Show the Way to Rear Indigenous Animals

Organization - Navjeevan Mahila Okkuta
Location - Raichur district, Karnataka
Year of Intervention - 2006 onwards
Communities - Dalits



Raichur district of Karnataka is a semi-arid region with low rainfall. Agriculture is mostly rain fed here and only a small area has irrigation facilities. In the villages, about 80 per cent of the agriculture is rainfed and only 20 per cent of the farmers have irrigation facilities. The major crops cultivated are bajra, sunflower, jowar, groundnut, paddy, red gram and green gram. Agriculture provides work only for 4–5 months in a year.

The main livelihood of the Dalits¹ in the district is wage labour. Around 40–50 per cent are landless. Even those who own land have very small land holdings ranging from 1 to 3 acres. Nearly 50 per cent of the households migrate to Bangalore, Goa and Pune in search of work every year. In some households only the men migrate but in some others the entire family migrates for up to 6 months in a year.

Livestock is a major source of income with about 30 percent of the households in the villages rearing sheep and goat. There are relatively fewer cattle and buffaloes, as there is a huge scarcity of fodder and water in this drought prone area and farmers sell their animals to meet their other regular needs. Once they sell animals, it is very difficult to repurchase animals.

The Problem

Dalit families in these villages are socially and economically oppressed. They do not own any productive assets like land or livestock to lead a respectful life. They have to depend on wage labour or have to migrate in search of work to the cities where there are no basic facilities to live. Some of the dalits are also working with the rich farmers as *Jeethagadu*, or virtually bonded labourers. Providing them with some kind of productive asset was the immediate need.

Navajeevana Mahila Okkuta (NJMO)

Navajeevana Mahila Okkuta (NJMO) is a people's organization working for family empowerment and social justice. Family empowerment includes economic, social and political empowerment. The organization's focus is on education, health, awareness building on people's rights and violence against women. The organisation was

¹ Scheduled Castes

established in 2004 and has been working mainly with the dalit women. Dalit women Self Help Groups (SHGs) were formed in 54 villages in four talukas namely Lingsur, Manvi, Devdurga and Sindhanur. Total membership is around 900 women in 64 SHGs. All the SHGs are formed into a Federation. Through the SHGs the organization takes up income generation programmes and village development activities. The *devadasi* system² is widely prevalent in these districts as in all other districts in Karnataka. Abolishing the devadasi system is also one of the objectives of NJMO.

NJMO's work in Raichur district

In Raichur district, NJMO had initiated income generating programmes to provide alternate means of livelihood to the dalit women. SHG members save money and with those savings take loans for marriages, construction of houses, health expenses and children's education. NJMO identified that sheep and goat rearing would be profitable for landless women and this would provide alternative livelihood for the poor families. It was also identified that local buffalos and local cows will be suitable to the area. NJMO held discussions with the SHG leaders about this. SHGs agreed to the suggestion and expressed interest to purchase animals on loan.

Income generation programmes were started in 2006 and the loans were given by the federation for purchasing sheep, ram lambs, goats, local buffalos and local cows. Loans were also given for agricultural purpose and for petty business, neem seed collection, sale of paddy, and sunflower seeds.

In the first year (2006) women members were given loans of Rs 1200 each which they utilised to purchase ram lambs (Kenguri breed) and goats. Ram lambs are purchased when they are 3–4 months old for Rs 1200 and are reared for another 4 months. Then they are sold for Rs 3000–3200. Thus they get a profit of Rs 1800–2000 within 4 months. Those who have purchased goats rear them and sell them after they kid, and then rear the

² This is a very oppressive system where a woman is supposedly married to God but becomes the property of everybody in the village. It is mostly dalit women who are forced to become *devadasís*.



kids. Eighty women had taken loans and all of them repaid these within six months to one year. In the second year 200 women came forward to take loans for sheep and goat. They were given an amount of Rs 4000–5000. Out of the 200, 8 women added their own money and purchased local cows which cost between Rs 7000–8000. The repayment of the loans in the first two years was without interest.

Insurance of the animals

NJMO wanted to insure all the animals purchased with loans. When they approached the authorities, they were told that animals purchased on government loans alone would be insured by the government and there should be at least 50 animals in a village. As these conditions were not suitable, the organization designed an alternative system of insurance. The beneficiary has to pay Rs. 100 for every Rs. 1000 of loan amount while taking the loan. If a loan animal died the organization would pay the amount given as loan so that they could purchase another animal in its place. If they want a loan again the organization does not charge interest. The group insurance mechanism was initiated in 2007 with 35 animals.

In 2008 the insurance was extended to 80 women. The insurance system in the beginning was not accepted by the women because they strongly believed that if an animal was insured, it would die. Gradually they changed the perception about loans and now agree to make the contribution.

Adding Value to the Livestock Livelihood Interventions

In May 2007, two staff members of the organisation joined the Anthra training programme on Dryland Agriculture and Livestock Development. The group was at a point in its own work, where they were debating whether to distribute graded buffaloes or cross-bred cows to their women members, or continue to respond to the demands of the women who wanted loans for only indigenous breeds of cows and buffaloes. Through the training, the NJMO staff were exposed to diverse dimensions of livestock production in dryland regions including appropriate breeds, feeding strategies, fodder development, housing, management, health care and the applications of herbal medicines. The training strongly re-enforced the benefits of rearing local breeds under resource-stressed ecological regions, where local breeds have the inherent capacity to withstand stress situations and resist diseases while continuing to produce and reproduce with minimal problems.

In 2008, 500 women were given loans, out of which 50 took loans for agriculture, 10 for petty businesses and the remaining 440 for livestock. Fifty per cent of the loans given for livestock were for ram lambs and the remaining were for goats, local cows and local buffaloes. Fifty one women took loans of Rs 8000 each for local cows. The system of collecting interest for loans was introduced from the third year. The interest for the loans was 24 per cent, out of which 12 per cent went to the village SHG and 12 per cent to the federation.

There is a big demand from dalit women for loans to purchase local cows. The reason is that the women find it more beneficial to buy a local cow rather than a high producing dairy animal. The cow gives some milk, manure



for their fields; or if they are landless they sell the manure. Most important of all, it gives them calves every 1.5 years thus increasing the stock of animals. The offsprings fetch a good price in the local market.

In Lingsur taluka some women purchased local cows for producing ghee. They sell it in the local market. Ghee is sold at Rs 200 per kg. There is a belief that ghee from the local breed is better and hence preferred rather than that from cross-bred cows. In areas where dairy cooperatives or private dairies run milk routes to collect milk, the women sell milk from the cows, after keeping some milk for their own consumption.

NJMO also tried giving units of local poultry on loans to women and monitored their performance to gauge the profitability. Earlier the women had identified that in poultry rearing predators are a major threat. In 2007, seven women members from village Narbandi were given poultry. Each woman was given a loan of Rs 1500 and they purchased 9 hens and one cock. This was given from the SHG savings. So the repayment was also made to the SHG. Wild cats were a major threat to the small chicks. To address this problem an iron mesh was provided by the federation to the women along with the loan amount. The chicks were reared inside the mesh and only the elder birds were left out. Till 9 months all the birds were healthy. All the hens gave eggs which hatched into chicks. The flocks have increased. Five women sold birds from the first clutch and got some income.

A major lesson learnt

During summer of 2007 there was an outbreak of Raniket disease. The staff members who were part of Anthra's training program and had learnt about the need for preventive RD vaccines, approached the local veterinary doctors before the outbreak and requested them to come and vaccinate the birds. But the doctors told them that they would come and vaccinate only if there were at least 100 birds in a village, as the vaccine vial has 100 doses and once it is opened it should be used within 2 hours. As this was not possible in the village the vaccinations could not be given. Half of the birds died due to Raniket disease. This was a major learning for the organization.

The bimonthly training inputs spurred on the organization to pro-actively access the government veterinary services. NJMO made several attempts to access health services from the local government veterinary hospitals to vaccinate and deworm the animals. Health camps are held by government veterinary doctors at random intervals, without any kind of system or regularity. Deworming medicines are distributed at no cost. In 2007, out of 60 villages, only two had health camps where government vaccinated the large ruminants against Haemorrhagic septicemia (HS) and Black quarter (BQ). Foot and Mouth Disease (FMD) vaccine was never given.

Soon after purchase of the animals the farmers go to the nearby veterinary hospital and get the animals dewormed. The hospital also distributes mineral mixture at no cost to the farmers who own dairy animals, whenever they have stock.

In October 2007, 30 SHG women from 15 villages were trained by Anthra in poultry and sheep and goat management. They were introduced to the important feeding practices, preventive vaccination and deworming regime and first aid using herbal remedies.

Gradual Change Despite Challenges

The repayment of the loans has been 100 per cent and there were no problems in this respect. The experience of women is very encouraging and they say that rearing sheep and goats is very profitable and suitable for them. These sheep and goats are like a bank for them. They sell them whenever they need to meet any major expenditure in the family.

Dalit women were provided with supplementary sources of income which is in addition to their wage labour. Income levels have increased and the level of indebtedness to money lenders has reduced. This has improved the confidence level of the women. Women are convinced that indigenous breeds of livestock are far more suitable and useful for them.

Convincing dalit women to become animal rearers (who in this region had very limited experience of direct ownership of livestock), was the main challenge in the

initial year, as dalit women lacked confidence in their own capacities to rear the animals effectively.

Getting government insurance for the animals was a big problem. In the beginning, it was a challenge to convince SHG members to insure their animals through the organization insurance strategy.

The absence of continuous and whole-hearted support from the government veterinary doctors is an ongoing problem. The reality is, the government system is very important and crucial as it is completely impossible for the groups to manage all the health related problems, particularly when it comes to their role of making available timely and sufficient vaccinations. When vaccines are available, vaccinations were not carried out due to shortage of staff. To address this gap, NJMO requested Anthra, to train SHG members who will be selected by their groups, to vaccinate animals.

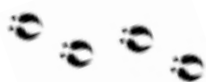
Finally, it was a huge challenge to convince the Scheduled Caste (SC) Corporation to disburse loans to dalits, for local breeds of sheep, goats and cows as they were only prepared to give loans for cross-bred dairy animals or for enterprises.

Meticulous care has to be taken when animals are purchased and sold. Sometimes animals die soon after they are purchased due to disease, and hence ongoing capacity building of the women members has to happen.

Looking Ahead

NJMO's efforts are grounded in the real struggles of women and place their concerns at the centre of their work. Regular review and monitoring is carried out by 10 women representatives from the federation. Livestock asset building as a livelihood is extremely popular as it is giving multiple returns including income to the women. A programme began with 80 women, reached out to 500 women in 54 villages within 3 years. This is a unique programme in the district as nowhere else are poor dalit families able to purchase local animals on loans to improve their livelihoods, and sets an exemplary example to all those who say that 'loans for local animals to poor women' is credit-unworthy!

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The Much Maligned Goat: The Poor Woman's Cow

Organization - Indian Institute of Development Trust (IID)
Location - Thanjavur district of Tamil Nadu
Year of Intervention - May 2007 onwards
Communities - Dalit women



Vattantheru is a remote village comprising of 30 families. It belongs to Budaloor Block in Thanjavur district of Tamil Nadu. It is a drought prone area of the district which was once known as the 'rice bowl of Tamil Nadu'. The people of Vattantheru are mostly Dalits or Scheduled Castes (SCs) and used to work for a *Jamin* (Landlord) called *koonampattin jamin*, and their existence was virtually like bonded labourers. They did not own any assets in the form of either land or livestock and were totally dependent on the landlord. They worked for a meager wage, most of which went towards repaying a loan which their parents or forefathers had taken from the landlord many years ago. Their children, instead of going to school, also used to work for the landlord. They did not have any alternate sources of income. No one questioned the mighty landlords. This was the scenario 15 years ago, before the Indian Institute of Development Trust (IID) began to work in the region, after which things began to gradually change.

IID Trust is a registered Trust working for the betterment of the rural poor by creating awareness about land, agriculture, livestock and livelihoods. IID believes that life is sustainable when humans live in amity with nature. It is of the opinion that the poor who possess creativity and the attitude for hard work should be mobilized to preserve culture and nature. IID also believes that livestock is an integral part of nature and natural cycles.

IID Trust raised awareness amongst the rural poor, particularly the dalit women, on poverty, its causes and strategies to bring about change. IID began to work with the dalit community and organised women into groups. Two such women's groups were formed in Vattantheru.

There are 13 women each in the *Kolunchi* and the *Vahai* groups.

They were trained on aspects concerning community organizations and leadership, land rights, natural resource management, importance of savings and income generation avenues. They are now united to fight for their land *patta* rights.

How the Work Was Planned

Before IID Trust's livestock development activities were initiated with dalit women in May 2007, various other NGOs in that area had distributed cross-bred cattle to villagers in the neighbouring villages. The cows did not perform

well and those programmes were a total failure. When the groups were formed in these villages the group members expressed their interest to rear goats. While there are severe restrictions on grazing goats in the forests in Tamil Nadu, which are strictly enforced by the forest department officials, the women insisted that they would benefit most by rearing goats, and were confident that they could graze the goats on the road sides, field bunds and fallow lands. IID felt it was important to support the women, and initiated their work on goats, with 26 landless dalit women.

Implementation Process

At about the same time, Dhanalakshmi and P. John Britto from IID joined Anthra's training on Livestock and Livelihoods, where they were trained on a range of subjects related to livestock rearing and bio-farming. These inputs assisted them to refine and develop their ideas and helped to reinforce their decision to go ahead with assisting 26 dalit women with loans to purchase local breed goats towards strengthening their livelihood. Dhanalakshmi made arrangements from the Anbulagam Women's Bank (an initiative of a federation of dalit women) for all 26 women belonging to the two groups to receive loans to purchase the goats. Each woman got a loan of Rs 5000 with which they purchased three goats each. The women went along with the staff members of IID and purchased the goats from Thirukattupalli weekly market.

Dhanalakshmi was successfully able to train the women on the fundamentals of goat management which included the use of simple herbal remedies as first aid. Today the women are confidently using first aid medicines for common problems like injuries, wounds and diarrhoea.

The women take the goats along with them when they go to the fields for work and tie them to a tree. The goats graze on the shrubs and herbs available around that area. When they return home, they feed the goats leaves of Neem and Acacia. In the summer months they feed them fruits of Acacia.

Within six months of purchase, all the goats delivered between one to three kids. The goat kids were left at home for a month and later they were also grazed along with the mother.

As of August 2008, all the goats have kidded for the second time with almost all the goats giving birth to twins. Now each woman has three goats and more than five goat kids. All of them have sold the male kids from the first kidding (a minimum of three goats were sold by each woman) and used the money for the education of their children, for marriage and health expenses.

The agreement was that they will repay the total loan amount in 10 months (Rs 500 per month) with 12 per cent interest. Most of the women have repaid the loans, except three who are yet to repay around Rs 1000 each.

Linkages with the Government Departments

IID staff helped the women get guidance from the doctor at Government Veterinary Hospital at Sengipatti, a town about three km from Vattantheru. The doctor goes to the village once in three months. The doctor has administered PPR* vaccine to all the goats.

The Successes and Challenges

The major challenge is the lack of grazing lands as the women are not allowed to graze their goats in the forest. So they graze the goats on the fringe lands, bunds and road sides. Lack of grazing rights in forests will be the most limiting factor to their being able to increase their flocks by a modest level.

From the initial 78 goats, now the 26 women have 196 goats. This is after the women sold a few in the last three months. The money earned helped them to enroll their children in schools. Now they send their children to schools and because of this programme they could prevent dropouts. This additional source of livelihood has considerably reduced their dependency on the landlords. One of the women's family has taken land on lease for agriculture with the confidence that they have the goats to repay the amount.

* *Peste des petits ruminants*

'I run my family from the income I get by selling goats.'
— Manimekalai, Vattantheru.

'If my children are studying and we live in a decent hut, it is because of my goats.'
— Lakshmi, Vattantheru.

'We now eat three meals a day. I am confident about life now.'
— Rajeshwari, Vattantheru.

Dhanalakshmi is able to add to the existing knowledge base of women, with the several skills she learnt through the Anthra training. While IID had been working earlier on different aspects of ecological agriculture, they have been able to enlarge their canvas of work with livestock. Dalit women who were at the mercy of the landlords for so many years, are today being able to live a life of dignity, as also feel empowered because their choice and decision of livestock rearing is respected and supported.

Success and Beyond

The programme was a success because it was launched through a women's group where the intervention was primarily determined by the women themselves. Women took complete responsibility of looking after the goats and

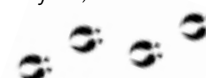
repayment of loans. The repayment of loans was also high, as it concerned a livelihood where the women were completely confident of the livelihood generating sufficient returns to ensure precise repayment. The women received additional management inputs and were able to use herbal medicines. There was regular follow-up by the veterinary doctors. All this helped to prevent disease outbreaks. Above all, women organised, are in a powerful position to challenge the domination of the landlords as also to explore livelihood options to supplement wage labour.

Following the success of this programme, women from two or three neighboring villages are now requesting IID for goats. The organization is planning to give them the same.

Uniqueness of the intervention

What is unique about this intervention in the region is that for the first time women's choices regarding livestock determined the nature of support, and women chose goats, which were distributed for the first time. All other livestock loan and livestock asset building programmes of the government or NGOs insist on distributing cross-bred dairy cattle to poor families, particularly to women beneficiaries, and never bother to listen to the women, and respect their decisions, knowledge and needs.

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Umbalacherry Cattle help Rebuild Tsunami-Hit Livelihoods: A Unique Effort

Organization - Kudumbam
Location - Nagapatnam district, Tamil Nadu
Year of Intervention - January 2005 onwards
Communities - Farmers



In the coastal areas of Nagapatnam district in Tamil Nadu, small and marginal farmers have traditionally had to cope with alternating periods of droughts and floods. After the Tsunami in December 2004, the receding flood waters, salinated huge tracts of once fertile agricultural lands. The small and marginal farmers found it extremely difficult to cope with this new problem and began to sell their lands and migrate to nearby cities. These problems were compounded by the fact that 50 per cent of the livestock (dairy animals, goats and poultry) had perished in the Tsunami and farmers were left with no alternate livelihoods.

Many NGOs involved with relief, rehabilitation and reconstruction work post-Tsunami distributed cross-bred dairy cows and graded buffaloes to the farmers for income generation. Under government programmes, cross-bred cows were given to the fishermen who have never reared farm animals. This created several problems. Since there was no land available to graze near the sea coast, the fishermen were grazing the animals on the fields belonging to other farmers. This led to conflicts between the fishermen and the farmers. Again, as there was no green fodder available, farmers had to purchase the feed, thus incurring huge expenditure for feeding the cross-bred animals. The cross-breds were found to have extremely low disease resistance and were constantly falling sick.

Kudumbam's work in these Tsunami hit areas

It was against this backdrop that Kudumbam began its work in three talukas of Nagapatnam district to assist communities rebuild their lives and livelihoods post-Tsunami. Kudumbam focused its efforts in revitalizing agriculture and land-based livelihoods by formation of farmer groups and training them in organic farming approaches. Kudumbam has a long history of working on ecological and low external input sustainable agriculture (LEISA) in Tamil Nadu since 1982, when it was established. It has a head office in Tiruchirapally and is working in nine districts in Tamil Nadu.

Relief work was followed by community organizing efforts. Forty three farmers' groups with 700 members were formed in 23 villages in 13 Panchayats in three talukas (Nagapattinam, Kilvelur, Tharagambadi) to help them to promote organic farming. They hoped to

encourage the farmers to work collectively to rebuild their agriculture using ecological farming practices. The farmers' groups were federated into six village level federations. The groups were comprised of all castes such as Vanniyar, Yadhavar, Devar, Nadar, and dalits (scheduled castes), who formed the majority. The farmers were trained on different techniques and methods of organic farming to restore soil fertility. The major crops cultivated were paddy, green gram, black gram and groundnut.

When Kudumbam initiated its work in January 2005, they found that there was an acute scarcity of cow dung and cow urine which was required for preparing various inputs like herbal solutions for organic agriculture. There was a huge decline in local animal breeds, and in the Kudumbam experience, the cow urine and dung of local breeds was far more potent and effective than that of cross-breds. Purchase of inputs like vermicompost from the market was very expensive and went against the LEISA concept of using local materials and resources.

Kudumbam was concerned about these issues, but had no idea as to how to address them. Around this time, Anthra had announced training on dryland agriculture and livestock development, and Kudumbam decided to send two participants to join the training programme which began in March 2007. They participated in all the six modules of the training programme which covered a range of issues such as conserving local livestock breeds and community livelihoods, feeds and fodder, management and health care. The modules emphasized the close relationship between agriculture and livestock and encouraged participants to look at indigenous knowledge and practices in their regions. These inputs helped them to conceptualize a livestock development plan to restore and rebuild the local cattle breed of the region – the Umbalacherry breed. Kudumbam felt that this would additionally address their original concerns of urine and dung from local cattle.

The Umbalacherry breed was a traditional breed of the region, and was multipurpose in nature providing draught power, milk, dung and urine. The breed had declined significantly since the last decade or so, ever since priority began to be placed on the cross-bred milch cattle.

Grounding the Umbalacherry Idea

Kudumbam encouraged farmers to discuss ideas of rebuilding the cattle and agricultural wealth of their region, and they prepared guidelines and developed a strategy for achieving health for soils, fields, crops and animals. These guidelines included

- Cultivate food crops
- Ecological farming based on farmers' producing their own inputs without purchase
- No use of chemicals and pesticides
- Promoting and acquiring indigenous breeds only.

Farmers' groups were encouraged to pass resolutions to the above effect, and of the 700 members who were in the groups, only 140 farmers agreed to the above guidelines. These farmers became the seed group to launch the indigenous Umbalacherry Cattle Programme, which was initiated in July 2007.



Each farmer was given a loan of Rs 8800, of which Rs 8300 was allocated to purchase the cow and Rs 500 for fodder development (Azolla) and also for input preparation like panchagavya, jeevamrutham, effective microbes and vermicompost. Insurance and shed cost had to be borne by the farmers. The repayment had to be done in 24 months with 18 per cent interest. The repayment would go to the Farmers' Federation. This money would then be used to give loans to other members. The insurance and shed costs would have to be borne by the farmers. Farmers purchased the animals from the neighbouring villages.

Before the farmers were given the loans, they were trained to select good animals, and on basics of feeding, management and preventive health care. The trainings continued even after the farmers purchased their animals and covered subjects like regular health care management, growing fodder for their animals and application of herbal remedies. Farmers were trained by the two persons who participated in the Anthra training, as also local veterinary doctors.

The local veterinary doctors were not very responsive in the beginning. They were constantly contacted and briefed by the Kudumbam staff. Gradually they started assisting the farmers in insuring the animals, treating emergency cases, vaccinations and de-worming. They also gave the farmers mineral mixture and potassium permanganate whenever it was available in the veterinary hospital.



There is acute fodder scarcity in the region for two reasons. First, there is hardly any land available for grazing, and second, the saline soils take time to regain their fertility. However, this problem was addressed by encouraging the farmers to cultivate food crops mentioned earlier which would generate nutritious crop-residue to be fed to the animals during summer. In the rainy season naturally growing green grass was supplemented by urging the farmers to grow 'Azolla'.

Despite this huge fodder shortage, these amazing Umbalacherry cows yielded two litres of milk per day, of which farmers consumed one litre at home and sold the remaining milk in the market. Some farmers also prepared ghee which is in demand in the local markets, as people prefer ghee produced from local cows.

Farmers have begun to prepare panchagavya from the urine and dung of their cows. Apart from using it on their own fields, they are also selling it to other farmers who do not possess animals. There is growing local demand for panchagavya and vermicompost.

The farmers are repaying their loans regularly and are extremely happy with their animals, and now appreciate their multiple uses.

The Fruits of Labour

Seeing the benefits of having local animals, members of the farmers' groups who do not have animals, have begun to ask for loans to purchase the Umbalacherry. With Kudumbam's hard work and vision, farmers gradually stopped using pesticides in 2007, and in 2008 they have reduced the usage of chemical fertilizers and have started using manure and vermicompost. The expenditure on agricultural inputs has decreased and they have stopped taking loans from the fertilizer shops. Farmers are consuming milk at home, which is naturally improving the nutrition and health of the family. Sale of excess milk, panchagavya and vermicompost have become a source of income. Farmers do not purchase feed from the market as they are growing Azolla.

Farmers are once again convinced about the importance of the local Umbalacherry cattle breed, and through their own efforts, the breed will sustain and multiply, thereby strengthening peoples' livelihoods.

Continuing challenges

In July 2007, despite the agreement and resolutions passed by the farmers, violating the farmers' code, seven farmers purchased cross-bred animals. The farmers did not insure their animals, and they were affected by FMD. Four calves born to these cross-bred cows died, and there was no milk yield. Those four farmers could not repay the loan. This was a major lesson for other farmers, who realized that by rearing cross-breds, they would have to face hundreds of complications and problems. This in fact acted as a stimulus to other farmers to opt for Umbalacherry, and 85 farmers went ahead in the first phase to purchase the Umbalacherry. The remaining

farmers are still to purchase animals, and the Kudumbam team is continuing their public education programme to inform farmers about the benefits of the local breed. Scarcity of fodder and water in summer months remains a problem. Azolla could not be grown due to water scarcity in summer months. As a step towards building fodder resources, in July 2008, fodder saplings were distributed to farmers to plant in their fields.



Another challenge is that rich farmers who cultivate prawns have started purchasing panchagavya from these farmers. They are using this in their aqua-culture farms, as they have seen a significant increase in the growth of prawns that are fed on panchagavya. These rich farmers offer a high price to the other farmers, and there is a growing threat that the latter will sell off their panchagavya to sustain harmful aquaculture farming, instead of using it to strengthen and enhance their own food farming systems.

Forming mixed caste groups was a challenge that had to be faced.

Reasons for Its Success and Future Directions

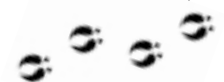
Training farmers and building strong farmer groups were key factors for the success of Kudumbam's work. Regular follow-up was done with day-to-day monitoring whereby farmers' problems could be addressed as and when necessary. Women play an important role in the groups, with two women from each group regularly participating in trainings. They in turn train others in their group. There is a sense of pride and ownership amongst the members of the farmers' groups. Every year, farmers celebrate 'Farmers' Field Day', an event where farmers share their successful experiences and challenges. The celebrations are organized and conducted by the farmers' groups themselves and farmers feel a strong sense of ownership about the entire process.

The Umbalacherry plan will be extended to other members of the federations after the repayment by the first set of beneficiaries.

These farmers' groups are unique as they have a clear objective of restoring their agriculture and livestock-based livelihoods using ecological principles, and are not merely micro-finance and credit disbursing organizations.



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Democratizing Livestock Ownership for Building Food Sovereignty

Organisation - Tholakari–Adivasi Mahila Vedika (A Platform for Adivasi Women), Girijana Deepika
Location - Rajavommangi, Y. Ramavaram, Gangavaram and Addateegala mandals in East Godavari district, Andhra Pradesh
Year of Intervention - 2003 onwards
Communities - Adivasis (Konda Reddy, Koyadora, Kondakammara)



Livestock—particularly cattle, goats and poultry—have been an integral component of the livelihood of adivasi communities living in the forested Eastern Ghat region of East Godavari district in Andhra Pradesh. The livestock and poultry contribute in multiple ways—to their agriculture in the form of manure and energy, transportation and a source of nutrition. It is also a source of income and essential for people’s cultural identity, important for festivals and bride price. Again as a ‘bank on hooves’ livestock can always be sold or bartered when the family is in need of cash. Adivasi People’s Organization Girijana Deepika has been working in the area since 1988. Since 1992 local adivasi people have been struggling to gain control over their natural resources and autonomy over food production. Girijana Deepika initiated ‘Tholakari’, a membership-based organization of adivasi women, in 2005. This organization continues to sustain and spearhead the struggle of local communities to take control over their resources and strengthen their livelihoods, and work on autonomy and sovereignty over food and agriculture production.

Between 1992 and 2002, Anthra provided veterinary, animal husbandry and ethno-veterinary technical support to Girijana Deepika. Thereafter, it stopped being directly involved in the day-to-day implementation strategy. Girijana Deepika identified that high mortality and morbidity amongst the livestock and poultry populations was a major reason for the decline and decimation of indigenous livestock and poultry resources in the area. The group decided to initiate an innovative strategy to arrest and reduce disease, and improve the overall health conditions of their livestock and poultry.

The critical components of their strategy to address the health issues include (a) improving the availability of village health care services by training village animal health workers, (b) building women’s capacities to effectively manage and feed their animals and birds, (c) enabling women to access regular preventive vaccinations from the government services and (d) encourage local systems of asset creation known as *vaata*.¹ Rebuilding local food-farming systems and crop diversity (millets, pulses and oil seeds), was the strategy used to build food security at the household level. This also provided diverse by-products and crop-residues to feed livestock and poultry a more balanced and nutritious diet.

The *vaata* system was initiated in 2000 as a means to rebuild 'poultry assets' of assetless women. This was also a strategy for *in-situ* conservation of the unique poultry genetic resources of the region –Aseel, Rencha, Agees, Koppu, Naked Neck and Denki to name the key breeds. All initiatives were grounded through village level gottis, a traditional forum of adivasi communities, which has been revived at the village level by Girijana Deepika, as the local community institution through which all action was routed. These are essentially village institutions for enabling community to debate, reflect and act on their concerns such as (a) struggles for land, (b) right to resources like forests, water and genetic resources, (c) efforts to diversify and rebuild their food-farming systems, (d) health, (e) upholding their constitutional rights, (f) making government work and (g) fighting against alienation of land and projects that displace them from their livelihoods.

The women members of the village gottis became members of Tholakari at the district level, paying an annual membership fee of Rs 5.

“Una vaala ki undi, lene vaale ki ledul!”
(Those who have, have; those who don't, don't !)

In 2003, Girijana Deepika carried out a detailed survey of land and livestock in their working villages, which confirmed that there had been a drastic reduction in mortality and morbidity of livestock and poultry. This clearly benefited those who already owned animals and birds. A disturbing part of the survey, however, was that while there was considerable buildup of poultry genetic resources in the village, there continued to be several Adivasi farmers who did not own cattle or goats. *Lack of cattle was a key reason why farmers left their lands fallow during the agriculture season, leasing the land out to non-tribals who grew non-food cash crops, finally forcing them to migrate to other areas in search of work.* Many farmers also said how they had lost their goats in earlier years (prior to the livestock work of GD), either due to social forestry programmes, mortality and disease, or need for money which forced them to sell their animals. Once the animal died or was sold, the farmer was unable to rebuild his/her goat assets, as there were limited or virtually no sources through which they could obtain loans to purchase

goats. The traditional way in which the *vaata* system operated was also not profitable for some farmers, as under this system the borrower has to return half the number of offsprings to the original owner, throughout the productive life of the original mother. Another challenge was to build the bullock assets of the farmer, overcoming the shortcomings of the regular government programmes where successive bullock loans had not achieved the desired objective of sustaining and building the livestock assets of the beneficiary family. Since as soon as the bullocks die or become old the beneficiary is back to square one. Similarly it was clear that assisting women to rebuild their goat wealth would pave the way to strengthen the livelihoods of the community.

Changing the Status Quo

The study findings were discussed with the women gottis, which generated some interesting ideas. One of these was to pilot initiatives to assist 'assetless' women to restock cattle and/or goats. The success of their experience with using *vaata* to build poultry assets led them to believe that this could be replicated in the case of other animals as well. The strategy suggested by women for goats was a modification of the traditional *vaata* system. In the modified version, the women were required to return one kid to the village sangham after the second kidding. They also discussed how the *Kanchu Mekha*, or the dwarf goat breed of this region, which is highly prolific, would be the breed to be distributed, as it kidded twice in the year with two to four kids each time.



For cattle, instead of merely distributing bullock loans, they suggested that the beneficiary be given a package consisting of a pair of bullocks and a young breedable cow. The women reasoned that the bullocks would plough the land and within five years the cow would conceive and

produce at least three to four calves. This replacement stock would enable the farmer to have new bullocks when his/her 'loan bullocks' grew old. The animals would provide valuable manure for the fields. The plan for repayment of the loan, which they conceptualised, draws from a local system of hiring bullocks called *Yeddu putti*, where a pair of bullocks is hired for an annual payment of about Rs 1500. Farmers agreed to repay their loan at an equivalent amount of what they would have paid to hire the bullocks. The total loan for a pair of bullocks and a local cow in 2003 was estimated to be Rs 7500, and the farmers agreed to repay this within five years. The women gottis decided that the bullocks and cows had to be indigenous animals, purchased locally. This would ensure a 'double benefit' as another local adivasi farmer would gain from the purchase. They also decided that recipients of the loans or animals must agree to grow local food crops using ecological farming techniques. The animals would be insured.

Girijana Deepika discussed the proposal widely with the women gottis. The gottis selected single and needy women who desired to get goats or cattle. Anthra was able to extend partial support to finance a pilot initiative. The village animal health workers were responsible for providing necessary veterinary care, mobilizing vaccinations and training the beneficiaries in good management practices.

Grounding the change

Gottis identified needy women and commenced with eight farmers from seven villages, all of whom were marginal and small farmers owning between three to six acres of dryland (see Table). The animals cost between Rs 5000 and Rs 7000. The animals were insured by the National Insurance Company. An agreement was drawn up with each farmer, where they had to agree to the conditions of the gotti. The farmers were trained on essential aspects of cattle care and management and on ecological farming techniques. Fodder saplings were distributed to these farmers to help them build their fodder resources so that they could fall back on these resources during drought. All the bullocks and the cows were dewormed and protected against black quarter and *Haemorrhagic septicemia* diseases.

Six of eight farmers were able to work their bullocks and use them to plough the land and cultivate different food crops in the year they received the animals. The remaining two pairs had to be trained and were ready for use in the subsequent agriculture season. Five farmers who had allowed their lands to remain fallow till then, were able to plough and cultivate their land.



Similarly, 15 farmers from four villages were selected as beneficiaries for receiving the Kanchu Mekha goats. The selected farmers were taken on an exposure visit to meet farmers who were already rearing these goats in another Mandal. Farmer to farmer extension and learning created tremendous impact. Farmers shared experiences on housing, feeding and managing the goats, and returned to their villages inspired to replicate these practices. Many farmers decided to construct traditional sheds/housing on stilts (*Mekala baddi*) which reduces the chance of foot rot, a major problem during the monsoons. It also protects the animals from predators. Farmers also agreed to plant fodder saplings near their sheds.

52 adult does and five bucks were purchased and approximately half of them distributed to the farmers in September 2003. All animals were insured. Within days of the purchase, unfortunately there was a massive outbreak of *Peste des petites ruminants* (PPR) all across Andhra Pradesh, including this area and 37 goats (65 per cent of the total animals) died. Post-mortems were conducted and sent to the Veterinary Biological Research Institute in Hyderabad, who tested the samples, and confirmed that the deaths were due to PPR. Immediately the farmers applied for insurance claims. But as per the rules, claims are only entertained after a period of fifteen days. Unfortunately the animals died within two weeks of being

insured, so they could not receive the insurance. *In 2003, PPR vaccine had not yet been released commercially in the market nor was it available with the local government veterinary hospitals in Andhra Pradesh.*

Despite this setback, the organization managed to save 35 per cent of the animals by treating them with a combination of homoeopathic and herbal remedies. The surviving animals were regularly de-wormed and vaccinated against contagious diseases. After the unfortunate death, 10 out of the original 15 farmers had goats, and between them they had 20 goats. The agreement worked out was that the Kanchu Meka rearers would repay the value of their animals within a period of one year. In view of the unfortunate mortality, farmers agreed that they would clear their loan by giving a kid to the farmers who lost their animals, and the new recipient would repay their loan.



In 2008 the Tholakari group was able to raise seed-money for supporting small livelihood needs of their women members. Many women gotti members expressed interest to rear goats. The women gotti leaders selected those women who did not have any animals earlier, nor owned any land, nor bullocks to till the land. They decided that each woman would be given two goats. The women would repay two female kids or its equivalent in cash, within a year. The women were trained by the Tholakari animal health workers to manage their goats, treat their animals with herbal remedies and de-worm animals using herbal medicines. The goats were de-wormed and vaccinated against HS and PPR procured from the government hospitals. Animals were de-wormed under the governments mass de-worming programmes. In July 2008, in Rajavommangi Mandal 18 goats were given to nine

women from nine villages. Out of these, 16 were purchased and two had been returned by a previous recipient to the gotti. Of the 18 goats, one goat has already kidded, seven are pregnant and the rest are still young. In Gangavaram mandal, 16 goats were given to eight women from eight villages under the *vaata* system. Eight women were given two goats each, of which 14 were purchased and two were obtained from an owner who had returned their share to the gotti. Of the 16 goats, five have kidded and the remaining 11 are pregnant. The women have devised different methods of grazing their goats. Some graze their goats with cattle, others take the animals along with them to the fields, where they graze. In Ammirekula village the women send the goats along with a flock of goats and pay the flock owner Rs 30 per goat per year. Some women send their goats along with other flocks that have bucks, and both farmers share the task of herding the animals by alternating the job between them. After the goats come home in the evening, they feed them with special creepers and climbers collected from the forests. They take special care of pregnant goats and small kids.



The Experience of Democratizing Ownership of Livestock

Despite the devastating PPR outbreak, which destroyed 65 per cent of the goats initially distributed in 2003, the intervention with goats has been a clear success. A significant indicator is that beneficiaries, who lost their goats due to the disease, were able to build their stock from the animals given to them by those farmers whose animals survived the massive outbreak, which is well

illustrated from this experience of Chaparatipalam village, Rajvomangi mandal.

In 2003, 20 Kanchu Mekha does and two bucks were distributed to 10 families, with each family receiving two does. Soon after the goats reached the village, 16 goats perished due to PPR, and only four survived. All four goats became pregnant and kidded producing twins. The farmers repaid their 'gift' by passing on one offspring each to four other farmers whose goats had died. The four original survivors in the past five years have produced about 75 offsprings. The four women who owned these goats sold roughly 23 goats and today each one owns between 18–20 goats totaling 52. The four women who received goats from the former, have also witnessed an increase in their flock sizes which average between four to eight goats presently. They have also been able to sell their offsprings, and two of them have already returned a goat each to the Tholakari sangham, and thus repaid their loan. The animals are 'bank on hooves' for these women. Income earned from animals that were sold, has been used for meeting several needs—inputs for agriculture, meeting health and education expenses of their families, festivals and marriages. They have not felt the need of approaching the moneylender or the SHG group for a cash loan! Each year the goat manure is applied to their fields. The fodder trees which survived, are also being lopped and the leaves fed to the goats. The goats returned to the Tholakari Gotti, are being redistributed to other women. Women beneficiaries are able to treat their animals with herbal remedies. Non-availability of PPR vaccinations continues to be a challenge.



The experience with cattle also proved extremely positive, and is a concrete pointer for rebuilding cattle wealth of farmers and villages. Of the original eight farmers, five continue to have their animals. Unfortunately two of the farmers lost their animals in massive floods which occurred in the region in August 2005, when rivers broke their embankment at night, and destroyed a number of villages, sweeping away human habitation, cattle sheds and the cattle. One farmer lost his animals when they ran away and he was unable to trace them. The approach enabled farmers to re-cultivate their fallow agriculture lands. Cattle manure was produced in sufficient quantity, and farmers did not apply chemical fertilizers, not did they have to purchase manure, to farm organically. Cows did get pregnant and in the period of five years, have calved twice producing offsprings, which are the replacement stock. Farmers have repaid 75% of their loans.

Stories of Redoji Pentamma and Kathuri Venkat Reddy

Redoji Pentamma from village Nugamamidi, Gangavaram mandal, owns three acres of land— 2.5 acres of dry land and 0.5 acre of wet land. Prior to 2003 the family was unable to cultivate their land because they did not have any bullocks and thus had left it fallow for a couple of years. They had been forced to sell their animals. The family was entirely dependent on wage labour for their survival. In 2003, Redoji Pentamma was selected by her gotti to receive a loan worth Rs 7500 with which she purchased two bullocks and a cow from a farmer in a nearby village.

In 2004 she started cultivating her fallow land and she sowed bajra, budama (dryland rice), ragi, jowar and cowpea. The crop residue was sufficient to feed her animals in the summer months. The manure from the animals was sufficient to cultivate three acres of land. The cow calved twice. The first time the calf died at birth, and then the cow became pregnant again, and is now with calf. She continues to cultivate food crops each year. She has repaid Rs 5000 till now, in the form of cash and grain.

Kathuri Venkat Reddy from Marrisipalam village, Gangavaram mandal owns 10 acres of dryland and two acres of wet land. Six acres of land was under his control and the remaining 6 acres was under dispute. Girijana Deepika, the local adivasi people's organization, helped him in a legal battle to regain rights to his land. For several years, he was unable to cultivate the land, partly due to the legal battle but also because he lacked plough bullocks. He would migrate each year to Maredumilli, in search of work as wage labour. In 2003 he and his wife were selected to receive the loan from the gotti, and purchased a pair of bullocks and one cow worth Rs 7500.

In 2004 he cultivated seven acres of his land, where he sowed budama in one acre, ragi in one acre, paddy in two acres and cashewnut in three acres. The manure generated from the animals was sufficient to manure four acres of land. As the size of his herd increases, he will put more land under cultivation. The grain from four acres of land is currently insufficient to feed seven members of the family. They supplement their livelihood by working under the National Rural Employment Guarantee programme. He is hopeful that through application of ecological practices learnt in recent years, he will be able to gradually enhance the food produced from his land. Five years down the road, he owns five animals—the original two bullocks and cow and two calves. The cow is pregnant for the third time. The intercalving period of the cow is approximately 1.6 years, which is excellent. He has repaid Rs 5500 to the gotti. Venkat Reddy says that this 'package' helped him immensely. He has stopped migrating to other places, is cultivating food crops and able to consume wholesome 'organic' food, free of chemicals and pesticides. He is using the farm yard manure and not spending any money on chemical fertilizers.



Challenges Ahead

The biggest challenge is to convince government officials such as the Integrated Tribal Development Agency, Indira Kranthi Pathakam (IKP) programmes, banks and other agencies that disburse credit, that they should adopt these models for assisting farmers to build their livestock assets. All these institutions insist on giving credit only for dairying animals, crossbreds or graded buffaloes. Credit disbursing institutions insist that farmers purchase Ongole bullocks, which are not only unsuited to the hilly terrain, but also require a lot of feed and fodder. Most importantly, none of these have an in-built mechanism by which a farmer can build their stock, nor respond to farmers' needs and demands. As far as distributing goats is concerned, the authorities are equally reluctant and women's groups had to campaign to convince the authorities that goats are perhaps the most useful asset for a woman. The insurance companies refused to compensate the farmer when the animals were lost due to disasters like floods or when they ran away. The current insurance schemes are completely unsuited to rural realities of marginal areas and marginalized communities. Health coverage in terms of preventive vaccinations continues to be a major challenge. Strong and sensitive village institutions such as the gottis are responsive to the individual farmers' needs, and their economic situations, and keep this in mind while considering aspects such as repayment. For instance, alternating years of drought and then floods between 2004 and 2007 resulted in lower crop yields than anticipated, and the beneficiaries were unable to repay the entire loan as envisaged. However, they are repaying in cash and kind, and the gottis are willing to be flexible. These systems embody the concepts of sharing and compassion, and it is important that these alternatives (despite some losses), are demonstrated.

It goes without saying that strong awareness and support mechanisms in terms of information and advice to the farmers were and are essential for the success of such interventions.

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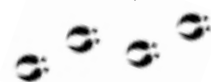


Table: Farmers Participating in the Pilot Programme of 'the Bullock and Cow' Package

Farmer's name	Total land (in acres)	Land before intervention (in acres)	Land utilization after intervention (from October 2003 to September 2008)	Fodder trees planted	Status of Animals as of September 2008
1. Odela Lakshmaih Mullavanipalam, Rajovamangi	4	2 – Sesame ½ – Finger millet ½ – left as fallow	Bullocks were trained and began to be used in the agriculture season starting June 2004. They are cultivating food crops.	Jack fruit <i>Oroxylum indicum</i> Gmelina arborea Phyllanthus reticulatus Pterocarpus marsupium Helicteres isora	Bullocks are still being used. Cow was sold as it did not conceive well. A new one to be purchased.
2. Eka Rajulamma Nellimetla, Rajovamangi	5	½ – Dryland rice ½ – Red gram ½ – Maize ½ – Sesame ½ – left as fallow	Hired animals	„	The animals were grazing in the forests, and did not return. The owner suspects that they may have been stolen.
3. Chilaka Somireddy Bullojipalam, Y. Ramavaram	3	1 – Dryland rice 1 – Sesame 1 – Cowpea	Began cultivating the land from June 2004 and continues to do so with food crops.	„	Bullocks are healthy; Cow calved twice.
4. Pallala Lingareddy Burgavada, Y. Ramavaram	5	Left as fallow	Cultivating traditional food crops	„	Bullocks are healthy; Cow calved twice and is pregnant again. One calf died.
5. Panda Pandu Dora Komaravaram, Gangavaram	5	½ – Red gram ½ – Little millet ½ – Foxtail millet Hired bullocks paying Rs 1500	The animals were trained to plough the fields in 2003, and ploughed the fields in June 2004. Unfortunately the animals ran away the summer 05. He hires animals to plough his fields	„	Lost animals in 2005–06. They ran away.
6. Kathuri Venkata Reddy Marrisipalam, Gangavaram	6 6 – under dispute	1 – Finger millet 1 – Bajra 1 – Pulse crop 3 – left as fallow. 6 – under dispute	Animals used from June 2004. Growing food crops in total land.	„	Bullocks are healthy; Cow calved twice, and is pregnant for the third time.
7. Rejodi Pentamma Nugamamidi, Gangavaram	3 Dry – 2 Wet – 1	Left as fallow	Cultivating food crops	„	Bullocks are healthy; Cow calved twice. One calf died.
8. Eka Ramanna Dora Chaparatipalam, Addateegala	6	2 – Bajra ½ – Maize ½ – Foxtail millet ½ – Sesame Hired bullocks		„	Bullocks are healthy; Cow delivered male calf in April 2004. Animals washed away in floods in 2005

Effective Utilisation of Animal Manure: Earthworms Lead the Way

Organization - Anthra

Location - District Ratnagiri , Maharashtra.

Year of Intervention - April 2002 onwards

Community - Marginal and small farmers



In many parts of the country livestock programmes are not very successful due to shortages of fodder or unfavourable conditions to run them effectively. The Konkan region of Maharashtra is one such region. This region is famous for many special products like alphonso mangoes, cashew nuts and the kokum fruit. The red laterite soil, while being excellent for these species, is poor in certain soil nutrients and there is an enormous problem of leaching of the top soil because of heavy rains. This led to farmers' migrating to cities like Mumbai for jobs especially in textile mills. Over time small farmers sold their animals as it became difficult to maintain them. Farmyard manure is thus difficult to obtain. In the recent past with the closure of mills many farmers have returned to Ratnagiri district in the Konkan region. However, farming is more difficult now than before. Farmers have to purchase chemical fertilizers and pesticides both of which are neither good for soil nor for the crops. On the other hand biomass is available in plenty.

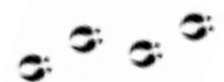
Manure and urine from cattle and other animals have extensive applications in organic/ecological farming. In Ratnagiri district, due to rich natural availability of biomass, a team of health workers trained by Anthra, has been successful in training farmers in the skill and practice of vermicompost and biopesticides. The high value mango and cashew crop, on which farmers survive, are prone to pest attacks and are heavily sprayed with deadly pesticides. The effort of these young Ratnagiri health workers had been to utilize local resources to transform the agriculture practices, to make soils, crops, animals and the environment healthy.

Initially a vermicompost unit was started in the small biodiversity park run by Anthra in village Tarwal of Ratnagiri district in 2002 under the small grants programme of

the GEF* project. The unit did well and the programme began to take shape in other villages in the area. In 2004–05, under the *Jal Swaraj* scheme of the Government, a small team began training groups in over 40 villages of the district. However, not everybody was in a position to begin their own vermicomposting unit. Again, despite government incentives and subsidies, construction of a vermicompost unit is expensive and if one makes a vermicompost pit on land, there are associated problems of ants, rats, etc. eating earthworms.

The Anthra team was asked by the Ratnagiri Zilla Parishad under the *Jal Swaraj* scheme, to organize training programmes in different villages on vermicomposting and

* Global Environmental Fund



biopesticides. Also with the help of the agriculture department vermicompost units were planned. In all 3430 vermicomposting pits were made in 23 villages. It was found that the biopesticides were extremely successful in preventing pest attacks and created a conducive micro environment for plant growth.

The basket vermicompost is a portable model and can be prepared at the household level even in urban areas. The government programme, although available with subsidies, is often too large for farmers to adopt immediately. Small units, especially like the basket model, allow farmers to decide the optimum size of the unit they are able to handle, at minimal cost and labour. The raw material and biomass are usually readily available.

Vermicomposting Methods Used

In Pits

Raw materials such as coconut leaves branches, dung, dry grass and green fodder, are collected and earthworms and gunny bags are readied for use. The vermicompost pit area is prepared using dung slurry. Coconut leaves branches, dung, dry fodder and green fodder are added in layers, and are kept for composting for 15–20 days. Earthworms are added to the uppermost layer and covered with dung slurry and finally with gunny bags. Vermicompost will be ready in a week.



In Baskets

Vegetable wastes from homes is collected and allowed to compost for at least eight days. A layer of coconut leaves or other suitable leaves are placed at the bottom of the basket to help drain excess water. The eight-day old composted material and 100 gm earthworms are added and covered with gunny bags. The vermicompost is ready within 15 days. At the household level, two baskets are kept so that one can be used for composting while the other can be used to prepare vermicompost. Several baskets may be required for accommodating materials at various stages of composting to ensure a steady supply of compost. If the basket is of 1.25 ft length, 1.25 ft width and 75 ft height, it contains three kg of green fodder which requires 100 gm of earthworm and produces one kg of vermicompost. In the same basket, one kg of dry fodder with 100 gm of earthworm will produce four kg of vermicompost and 10.5 kg of dung with 100 gm of earthworm produce 7.5 kg of vermicompost in 20 days.

Earthworm Slurry or Vermiwash

Secretion of the earthworms is called earthworm slurry or vermiwash. It consists of amino acids, vitamins, bacteria, etc. All these constituents are useful for keeping crops healthy. It is prepared by adding one litre of water to one kg of vermicompost and kept aside for 24 hours. It is filtered to obtain the vermiwash and diluted with equal proportions of water prior to use.

Some of the problems experienced included rat infestation of the vermicompost unit. This can be tackled by using *Glyricidia* leaves in the composting unit.

Though farmers are ready to use biopesticides some of them feel it is time consuming and challenging to prepare the solutions. However, several other farmers have eagerly adopted these methods and have found it very effective as the resources needed for it are easily available. They are slowly shifting from chemical fertilizers to organic ones as they find the quality and quantity of their crop yield have increased with these techniques.

Table: Sample of Biopesticides Used

Spraying	Ingredients	Methods of preparation	Use
First	Tulsi leaves (<i>Ocimum sanctum</i>) – 5 kg Nirgudi leaves(<i>Vitex trifolia</i>) – 5 kg Kali miri (Black pepper) – 10 gm Ritha (<i>Sapindus mucorosai</i>) – 10 gm	Take equal quantity of tulsi and nirgudi leaves and add black pepper and ritha to it in two litres of water. Boil the ingredients till it becomes half the quantity.	Mix one litre of biopesticide with 20 litres of water and spray.
Second	Cow urine and ritha (<i>apindus mucorosai</i>)	Collect cow urine. Keep it open for sun ray penetration. Add ritha to it.	Mix one litre of solution and 20 litres of water well and use it for spraying.
Third	Garlic (<i>Allium sativum</i>) 1 kg, Chilli 1 kg, Tobacco 1 kg	Take equal quantity of garlic, chilli and tobacco. Make it into powder form. At the time of spraying add ritha to it.	Add one litre solution to 40 litres of water, mix it well and use it for spraying.
Fourth	Tulsi leaves (<i>Ocimum sanctum</i>) – 5 kg Nirgudi leaves(<i>Vitex trifolia</i>) – 5 kg Kali miri (Black pepper) – 10 gm Ritha (<i>Sapindus mucorosai</i>) – 10 gm	Take equal quantity of tulsi and nirgudi leaves and add black pepper and ritha to it in two litres of water. Boil the ingredients till it becomes half the quantity.	Mix one litre of biopesticide with 20 litres of water and spray.
Fifth	Cow urine and ritha (<i>Sapindus mucorosai</i>)	Collect cow urine. Keep it open for sun ray penetration. Add ritha to it.	Mix one litre of solution and 20 litres of water well and use it for spraying.
Sixth	Garlic (<i>Allium sativum</i>) 1 kg, Chilli 1 kg, Tobacco 1 kg	Take equal quantity of garlic, chilli and tobacco. Make it into powder form. At the time of spraying add ritha to it.	Add one litre solution to 40 litres of water, mix it well and use it for spraying.



A Beginning with Goats: A Story from Rajasthan

Organization - Ibtada

Location - Ramgarh and Umren blocks of Alwar district (Rajasthan)

Year of Intervention - 2005 and onwards

Communities – Dalits, Meo muslim who are the most underprivileged in the community.



Ibtada (meaning 'the beginning') was founded in 1997 to work for the development of the Mewat region through community based institutions like women's self-help groups (SHGs), which promote livelihoods and education of the girl child. It works in district Alwar of Rajasthan in the blocks of Ramgarh, Umren, Kishangarhbaas, Tijara, Laxmangarh and Thanagaz

Important activities of Ibtada include:

- (a) *Savings and credit based women's institutions*: Ibtada had 228 SHGs under two registered federations in Ramgarh and Umren blocks. The two federations have 22 clusters. The organisation has expanded its works in Laxmangarh and Thanagazi blocks since July 2007 and has formed 195 SHGs bringing the total to 773.
- (b) *Livelihoods promotion*: Ibtada has promoted various livelihoods activities through its federations like buffalo rearing, goat rearing and horticulture development. Besides it has also worked on issues such as training of women paraveterinarians (*Pashu Sakhi*), biogas installation, housing and toilet construction as well as insurance for the SHG members.
- (c) *Education programme*: Ibtada has been running 102 *Taleemshalas* across the four blocks which are special schools for girls, and facilitate education up to the fifth standard.

Livestock Livelihoods

Ibtada realized that livestock was an important livelihood for local communities. They were contemplating distributing buffaloes to poor rural women to strengthen their livelihood. Around the same time in 2006, two of their staff joined the Anthra training on livestock and dryland agriculture. The training opened their eyes to a whole range of possible livestock-based livelihoods, where they analysed the pros and cons of different species in different agro-ecological and resource contexts. The Ibtada trainees began to explore avenues beyond dairy buffaloes.

Their search in the region led them to identify goat rearing as a major source of income for many families. In the Alwar area, at the time of Bakri Eid, there is huge demand for goat meat. One of poorest communities in the region are the Meo Muslims, who have traditionally reared a local breed of goat known as Battisi, where the males are sold at a very good price at the time of Eid,



when male goats are in huge demand as these are sacrificed. Families earn a good income at this time of the year.

Ibtada felt that these poor communities can be helped by introducing them to another local goat breed known as the Thotapuri, which is a cross between the Jamnapari and the Sirohi goat breeds. The Batisi is a short goat, black and white in colour which kids twice a year. An adult doe costs about Rs 2500–3000 and a two-month old kid can be sold at Rs 500. The Thotapuri is a taller goat with brown and red spottings on its coat. An adult doe costs Rs 5000, and a two-month old kid fetched between Rs 1500–2000 in the market. People who owned goats were happy rearing them, as they consumed less time, were easy to manage, are reared at no cost and are a low-risk activity as compared to rearing large ruminants. Goat meat and milk are good sources of nutrition, especially for women and children.

In March 2007, Heifer International (an organization that supports groups to assist communities to develop their livestock assets), helped Ibtada start up its goat project.

The Idea in Action

Ibtada kept in mind the resources of the area and planned accordingly. It implemented its ideas in those villages where grazing fields were available for goats and where families were in real need of goats. It also ascertained the availability of veterinary facilities, preventive vaccinations and markets for the villagers.

Families were also selected based on their interest and willingness to care for the goats. Ibtada initiated its work on goats in 9 villages, where there were strong SHG presence. Initially the benefits of goat management and the market value of goats were explained to the group. The SHG women who were interested in goats were encouraged to form a sub-group with focus on rearing goats to supplement their existing livelihoods.

They decided to distribute the Thotapuri goat, and 150 goats were distributed as loans to 50 families with each family receiving 3 goats. The families repaid their ‘loans’ by passing on as ‘gifts’ to other beneficiaries. This is how it works: a pregnant female offspring of the original goat is passed on to another beneficiary. If the goat produces a male it is sold and the beneficiary purchases a female in its place, and when it becomes pregnant, it is passed on to another beneficiary. Thotapuri bucks are distributed to the community and these are looked after by the community. Currently 135 women are beneficiaries of this intervention through which 405 goats have been distributed. The goats have been insured.

The person trained by Anthra, in turn trained women who would receive goats. They were trained in fundamental concepts of goat management, feeding, health care and disease prevention, adding to their existing traditional knowledge and expertise on goat management. Beneficiaries are encouraged to plant fodder varieties, and they are taught about ways to increase fodder, not only from fodder trees but also through managing agricultural land.



In addition he trained 14 women as animal health workers. Their role is to provide first aid at the village level. They also de-worm and vaccinate the flocks regularly. The women organise meetings with the goat rearers and share their knowledge with them. There are regular follow-up visits to the families. The women were paid Rs 300 per month while on training. Thereafter they were expected to earn their living through payments made to them by the community for their service.

Ibtada has linkages with the local animal husbandry department(AHD). They use their services for vaccinating and treatment of animals, and whenever there are emergencies. The support from the AHD is in addition to their own health-interventions.

Impact and Challenges

The beneficiaries observed an increase in goat flock size. The main source of income is from the sale of male kids. Training has been critical for empowering the communities to manage their animals effectively. There is a clear improvement in the economic status of the beneficiaries. The goat owners have formed their own groups through which they are able to work collectively on the problems they experience.

The beneficiaries have begun to use many practices such as taking special care to keep the shelters clean, care and nurse the sick animals, feed special concentrates and mineral mixtures to the pregnant and lactating goats, vaccinate and deworm their animals. They feed their animals through a combination of grazing outdoors as well as feeding them lopped leaves inside the shelter. There



has been a significant reduction in mortality, due to the regular inputs provided by the village animal health worker. Women paravets provide regular advice at the doorsteps, as also treat animals if there is a problem. The women paravets have gained confidence through the training, and have a unique identity in the village. The forests are critical for the goats as the only space for them to be grazed. The forest department places several restrictions on the goats grazing in the forests, which is the biggest problem faced by the farmers. Women who own one or two animals are able to feed them at home, while those with larger flocks have to graze them in the forests.

Loan programmes overwhelmingly distribute buffaloes, and some women took a while to come forward to take goats. Some beneficiaries stop being interested after a couple of months. This occurs in 10 per cent of the beneficiaries. Occasionally infertility problems such as non-conception and abortions occur. While in some villages the community manages the community buck, in other villages they do not. It remains to be seen whether the community animal health workers will be supported by the community (in terms of payment) or not. After treatment, paravets sometimes do not get a feedback from the goat rearers. At times family members cannot devote time to manage their animals.

Bringing goat rearers on to a common platform has been extremely important for the programme. Trainings have also been crucial for owners. Regular vaccinations, deworming and timely treatment are very important for the health of the animals.



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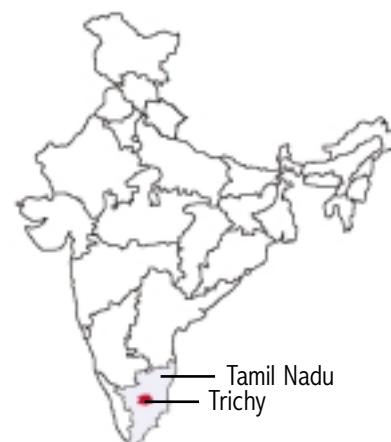
Making the Right Choice: Goats and Women's Livelihoods

Organization - Care and Share Charitable Trust

Location - Trichy district, Tamil Nadu

Year of Intervention - 2004 onwards

Communities - Dalits and other small and marginal farmers



Trichy district in Tamil Nadu is a drought prone area where the major livelihood is dryland agriculture. The crops grown in the area are ragi, maize, chilli, groundnut, red gram and cotton. Livestock in the area are mostly cattle, local dairy cows, cross-bred cows, kanni goats, kodi goats, sheep and poultry. Livestock rearing is a good source of income generation for the poor households.

The major problems faced by farmers were the lack of veterinary facilities, timely vaccinations, sudden cattle deaths, lack of knowledge on insurance schemes, and the inability to follow up on problems. They needed veterinary services in their villages and training, information, knowledge and skills on cattle management. Landless dalit and other small and marginal farmer households do not own any livestock and they are totally dependent on wage labour. They have limited assets and savings to bank upon during emergencies. So they take loans and have to repay these with high interest rates.

Organization and activities

Care and Share Charitable Trust is an NGO registered in 2004, under the Indian Trusts Act. It works with children, women, youth, agricultural labourers and small and marginal farmers in 30 villages of Thiruverumbur, Lalgudi and Pullampadi blocks of Trichy district. It has helped the villagers form participatory groups like Children's

Parliaments, Self-Help Groups (SHGs), Youth Clubs and organizations for small and marginal farmers. The major programmes they are involved with are child and women development, micro credit, livestock development, micro enterprises development and capacity building.

The organization works with women SHGs formed by the villagers for microcredit programmes. In the group meetings the women members wanted loans for dairy animals, but there was no marketing facility for milk. In the village the price offered for a litre of milk was Rs 7. The organization had several rounds of discussions with the women, where they explored and analysed the advantages and disadvantages of milch cattle and other species. The organization suggested taking goats on loan. After reflecting on all aspects, the women decided to take loans for goats, as the milk price did not appear to be sufficient for them to earn an income as also repay loans, if they took loans for dairy cattle. The programme was planned with the women leaders along with Krishi Vigyan

Kendra (KVK) staff, the NABARD manager and director of Care and Share Trust. The intervention was conceptualized based on the organization's practical experience and a series of training given by KVK, Trichy.

This intervention was started in 2006 in Thiruverumbur, Lalgudi and Pullampadi blocks where there were 122 beneficiaries from four villages (Reddimangudi – 83; Thatchankurichi – 10; Keelavilangualm – 10; and Chettiarpettai – 19).

Intervention

The organization gave loans to 103 women to purchase goats under their microcredit scheme. All these women were trained on goat management before the loans were disbursed.

Each woman in the group was given Rs 2000 to purchase one local goat at an interest rate of 12 per cent. The goats were purchased from neighbouring villages and weekly markets by the staff along with the veterinary doctor. All the goats were pregnant when purchased. All the goats were insured, the insurance amount was shared by the organization and the beneficiaries. The loans were given in a phased manner. First they were given in one village, and then to the others. The women from the first two villages have already repaid the entire loan. Now each family has an adult goat and a minimum of two goat kids. Most of them have sold at least one or two goats, and the income has helped towards various expenses in their homes.

This effort was substantially strengthened when the group got to know about Anthra's training programme. They sent two of their staff, who co-ordinate the livestock programmes, to participate in the training from January 2008. They were trained in different aspects concerning appropriate breeds and species for specific agro-ecological zones, strategies to enhance fodder, balanced feeding, importance of clean water, housing and sanitation, holistic health, prevention of diseases and applications of herbal remedies as first aid. They also learnt to identify important medicinal plants and prepare herbal medicines. They



returned after each training module and shared their knowledge with the women. This was further consolidated by visits made by the Anthra veterinary team consisting of veterinary doctors and animal health workers, who provided technical support and inputs directly with the women. The women also received technical support from the KVK, Trichy. The programme was supported by NABARD.

Tamil Nadu Agriculture University supported this process right from its conceptualisation and planning, with advice on health management, vaccinations and fodder development.

Impact of the Programme

- According to the women, this was the first time their families owned animal assets. Their success in managing the animals has inspired them to acquire more of them.
- Around 100 women are knowledgeable on different aspects of goat management, and are confidently using herbal medicines to prevent diseases and treat their goats.
- The women were trained on different facets of care and management of backyard poultry, goats, and milch cattle.
- The women are confident in their abilities to prevent diseases in animals through careful use of vaccination, herbal remedies and good fodder.
- There has been a modest but critical increase in income of these families.

Challenges and the Future

While animal mortality has considerably reduced, animals still die. For instance, two goats died due to disease. The positive difference was that as the organization had instituted an insurance mechanism, the insurance amount could be claimed by the two women whose goats died. In another case, a goat went missing while grazing, and hence the owner could not claim her insurance, according to the rules of insurance drawn up by the group. Some women beneficiaries did not renew their insurance in the second year. When one of their goats died, the owner could not claim the insurance.

The intervention will sustain and spread to other women, as the amount repaid from the original loans for goats will be given to other women, and be used according to their demands. At the time of writing this case study, new women beneficiaries want to utilize the loans for goats. Another 19 women will be getting loans from the Primary Agricultural Cooperative Society for rearing goats. Each

woman would get Rs 5000 as loan. The Bridge Foundation in Trichy has come forward to support 40 families in goat-rearing by sanctioning an amount of Rs 200,000. Each member will get Rs 5000 to purchase three goats.

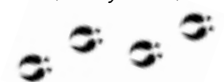
Here they do not face problems in grazing their goats, as there are sufficient common grazing lands, fallow lands, and luckily no 'reserved forests'.

Making a Difference

This is the first time that a programme such as giving goats to poor women to strengthen their livelihoods has been grounded, either by government or NGOs, in the region. The important aspect was not only listening to the women but also discussing the choices and options, so that women could finally make an informed decision. Careful planning, monitoring, continuous advice and technical support and follow-up have also played an important role in ensuring the success of the support extended to women of Trichy district.



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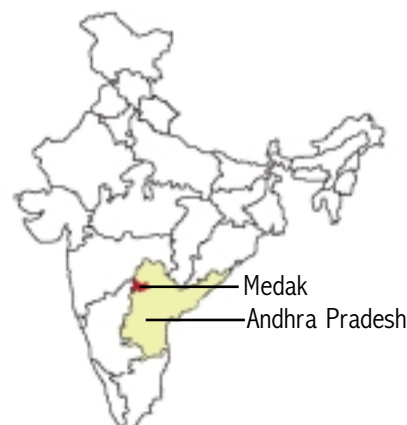
Supporting Peoples Visions of Development: Local Breeds, Local Crops, Local Food

Organization - Anthra

Location - Narsapur division, Medak District, Andhra Pradesh

Community - Landless Dalit women, shepherds, small and marginal farmers

Year of the intervention - 2007



Medak district is a semi-arid region with rainfall ranging from 650 mm to 900 mm. Traditionally agriculture has been rain fed, with diverse dry land crops such as millets, pulses, local paddy, local cotton and vegetables being cultivated. In this region livestock is important and plays a key role in people's livelihoods, especially for landless and marginal farmers. There is huge diversity in livestock species and breeds. Cattle, local buffaloes, sheep, goats, donkeys, pigs and poultry are the major species being reared. Livestock play a multipurpose role contributing draught power, manure, milk, meat, offspring, transport, income through sale and important for sports and festivals. Medak district has three types of livestock production systems, namely pastoral, agro-pastoral and mixed crop-livestock. Sheep and goat rearers migrate with their animals at different times in the year, for periods which vary from 2 to 9 months.

There has been a huge change in the cropping pattern, thanks to the green revolution and new agriculture policies formulated by the government. Dryland food crops were replaced by water-intensive crops like sugarcane and hybrid paddy varieties. Local maize has been replaced by hybrid maize, not for human consumption but sold to companies which produce poultry feed. This change in the crops has resulted in decrease in crop residue availability and has added to the chronic fodder scarcity of semi-arid regions. The onset of Joint Forest Management programmes has also imposed restrictions on animal grazing in the forest. Goats were banned.

Declining Livestock Wealth

All these have resulted in the decrease in the livestock population. Poor households were forced to sell their animals. Once they sold the animals, they could not re-acquire these assets.

Government, on the other hand, has introduced outside breeds like Red Nellore sheep in this Deccani breed tract and distributed high producing Murrah buffaloes through loan programmes. This has been a criminal act in the sense that these new breeds require and consume greater quantities of fodder and water which is highly unsustainable in a chronically drought-prone district. These high

producing animals were unsuitable to the local climatic conditions of high temperatures in summer and severe cold in the winter and thus were more prone to diseases. The local buffaloes which are of Pandharpuri type, on the other hand, are adapted to the area, and survive on the available meager fodder, calving once every 1.6 years, with milk yields that range from 3 to 4 litres per day.

It has been argued in the mainstream that indigenous buffaloes, which are disparagingly termed in official parlance as 'non-descript', are not sustainable as they do not produce enough milk, and hence graded Murrah buffaloes should be promoted to increase the incomes of poor families. This is being done indiscriminately across all agro-ecological zones and land holding categories, irrespective of the fodder and water availability and the suitability of the breed. Several farmers especially in the semi-arid regions who have taken Murrah buffaloes on loans have observed a dramatic drop in milk yield as soon as these animals are transported into the dry, rainfed regions. The farmers are unable to repay their loans, leave alone getting any income and profits from these animals.

Different Thought and Action

Community representatives raised different facets of problems and challenges that they faced with respect to their livestock related livelihoods.

Farmers, who reared local buffaloes, were frustrated as there were a limited number of Pandharpuri type breeding bulls available in the villages, and they were being forced to use artificial insemination (AI) to inseminate their buffaloes. Their problem was that they did not want to change their breed to Murrah, and through AI, their animals would be inseminated with the latter, and thus the calves born would be 'different' and have '*gowdi bhare*'* blood. They wanted their own breeds, which were most suitable to the region.

Close to 90 per cent of the Dalit households in the region did not own even a single livestock asset, and were completely dependent on wage labour for their survival.

*Graded Murrah

They wanted goats or buffaloes, but were nervous about rearing them, as they did not have previous experience.

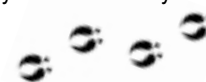
Dalit women wanted to buy local Pandharpuri type buffaloes, but their loan applications were repeatedly rejected, and instead they were being told to purchase graded Murrahs. The officials told them that loans were only available for the latter.

Mainstream rural development, poverty alleviation programme and banks that disburse loans to farmers, particularly to historically marginalized communities and women, have been skeptical about financing local breeds, inevitably terming them as 'risky', 'credit unworthy' and 'unproductive' and insist on loans for Murrahs, Jerseys or Red Nellore units.

Anthra decided to test these mainstream hypotheses, by initiating pilot support to assist communities to ground their visions of livestock development, simultaneously extending close technical support as also documenting the process. The three distinct yet interconnected experiences of strengthening the local livestock livelihoods of marginalized communities in Medak are described below. A significant objective of all the experiences has also been to break the historical caste injustices and demonstrate how livestock can be used to strengthen livelihoods and challenge social and economic injustices.

Breaking Traditions: Shepherds Support Dalit Women to Rear Goats

Anthra has been working with shepherds in several villages of Narsapur division in Medak district since 2003–04. Sheep and goat rearers constitute nearly 1/4th of every village. While historically Kurma and Golla communities have traditionally reared small ruminants, in recent years several other communities have also begun to rear sheep and goats, particularly in a scenario of declining returns from crops. Anthra has been involved in organizing shepherds into groups to work on their common problems, extending technical support to shepherds, providing them information on diseases and management, helping them to deworm and vaccinate their animals, use herbal and homoeopathic medicines as first aid and introduce them to ways in which they could feed



their animals strategically. These inputs helped to reduce mortality and morbidity in the sheep and goat flocks, increase lambing and kidding and resulted in increased returns to the shepherds. *While working with the shepherds Anthra realized that dalits in the same villages did not own any livestock assets. This was of deep concern to us, as it clearly increased their vulnerability.*

Anthra conceived a plan whereby shepherd sanghams, who had benefited from the organization's training and other technical support, should gift a goat or goats from their sangham to Dalit women, and that this 'gift' would act as a token repayment of Anthra's support to the sangham. Initially the shepherds were extremely reluctant, and their opposition was particularly strong since the gift would be to Dalit women, not one of 'their community'. Several rounds of discussions were necessary to convince the shepherds, and finally they agreed to donate 16 female goats aged 6–7 months, which would be distributed to assetless dalit women.

Along with this activity, Anthra had simultaneously initiated its work with dalit families in several villages, mobilizing them into informal groups to discuss their livelihood concerns. Dalit women of Avancha village decided that 16 of the 26 dalit women in their sangham, would receive the goats. After the second kidding, the recipient should return one kid to the sangham, which would be passed on to other women in the sangha interested to rear a goat. Of the 16 women, six were landless and the remaining owned land ranging from 0.5 acre to 1.5 acres.



The women were trained in goat management and health care, and the innovative element was that experienced shepherds trained and shared their expertise with the women. A breeding buck was purchased and given to the group. They decided that they would collectively take care of the buck by paying the woman who looked after the buck, Rs 5/month. The breeding buck was purchased in April 2007 for Rs 2500. Community health workers of the shepherds sangham in the village, ensured that the goats were dewormed and vaccinated against *Haemorrhagic septicemia* and *Peste des petits ruminants*. Each beneficiary was also given a medical kit consisting of homoeopathic and herbal medicines. The community workers were available at all times to attend to health problems. Insurance companies refused to insure the animals.

The women participated in several training workshops on ecological agriculture and adopted these methods in their farming. For the agriculture season in June 2007, women with land borrowed traditional food crop seeds from the Deccan Development Society seed bank, and diversified their crops by planting jowar, green gram, red gram, finger millets and cowpeas. Earlier they were exclusively cultivating maize and paddy. They had mixed results in 2007–08, with some crops giving good yields, while others failed, largely due to insufficient rain at crucial periods. Four women returned 10 kg of red gram seeds to the sangham seed bank managed by women, initiated in March 2008. They now have an enhanced and diverse basket of crop residues and crop by-products, which encouraged them to seek loans to purchase buffaloes. Six women decided to take loans from a local milk vendor¹, and purchased indigenous buffaloes. In May 2008, once again the women borrowed local variety crop seeds of red gram, cow pea, jowar, maize and ragi from the seed bank and cultivated them, using various organic farming techniques that they have learnt. The women also applied these techniques for growing vegetables.

The goats are fed in multiple ways, which is closely linked to the nature of labour the women have to do at a particular point in time. For instance during the harvest

¹ They were unable to get loans for indigenous buffaloes from government programmes or banks. They sell the milk to the vendor, who deducts the loan from the amount paid for milk

season, women take the goats to graze in the fields, where they work. During the sowing season, however, they do not take the goats to the fields, as it is difficult to manage the animals. In some households, elderly men and women graze the animals. In other families they have entrusted the animal to another rearer to graze along with his animals. Apart from grazing, goats are fed at home with leaves and fruits of *Acacia nilotica* (babul), neem, and peepal as also vegetable wastes. Women have planted neem, *Albizia lebbek* (dirisena) and drumstick trees near their homes, and on fringe areas of their agriculture lands, which in another couple of years will be ready to be lopped and fed to the goats.

A year and four months down the road in August 2008, the experience with goats has been inspiring. Of the 16 goats, 12 kidded and the kids are about six months old. All the goats are pregnant for the second time, of which 2 have kidded, producing twins. Those women whose goats gave birth to male kids sold the kids, and purchased a second female goat.



Unfortunately, four of the 16 died, not due to diseases, but due to management related challenges. While two were severely attacked by dogs and died, the other two were fed excessively and died from acute indigestion and acidosis. The sangham decided that those who lost their animals could receive a second goat at half the cost. Two women asked for replacement of goats agreeing to bear 50 per cent of the cost. The two replacement goats got pregnant and kidded. Two women did not take the replacement goat, as they did not have money at that time.

The women are now able to repay their loans to the sangham, as their goats have kidded and are about to kid for the second time. Dalit women are the proud owners of goats which they are confidently rearing, and they are keen to increase their flock. They see these animals as a bank on hooves, and can sell the kids in times of emergency.

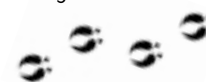
Anthra had to work intensively with shepherds to convince them about their role in this effort. Having succeeded in this it can be viewed as a step in the direction of breaking age-old caste hierarchies and divisions that exist within villages with respect to resources. Goat mortality was embedded in management related challenges, rather than diseases. These women had never taken care of goats earlier and there were initial teething problems. Many of them did not know how to manage the goats along with their other ongoing agricultural work. It took them a while to balance both. Women have subsequently evolved a community insurance plan for beneficiaries who obtain livestock loans. Some of the important reasons for success are (a) planning within the community; (b) training, particularly the inputs received from experienced shepherds; (c) technical support by community animal health workers; (d) working as a group; and (e) an integrated approach linking livestock and agriculture. The success of this programme clearly holds the potential for replication by other women. The goat assets has now enabled the dalit womens' sangham to obtain membership in a larger district federation of women working to strengthen their agriculture- and livestock-based livelihoods.

Most importantly, the programme clearly reveals that loans for goats and local breeds are credit-worthy initiatives, which can be 'banked' upon.

'LEISA²' Buffaloes are Sustainable

Neeru Yadiah and Neeru Sheekamma, of a dalit family in Achampet village of Medak district own 1.5 acres of dry land and a pair of bullocks, which is collectively owned along with two other brothers. They had left their land fallow for nearly 5 years between 2002 and 2007, as

² LEISA- Low External Input Sustainable Agriculture



they did not have enough capital to cultivate it where they used to grow hybrid maize under a contract farming arrangement, and occasionally cultivate red gram. After participating in several training programmes on ecological farming and livestock livelihoods, the family decided that they would cultivate their land with diverse food crops using traditional seeds of millets, cereals, pulses, oilseeds and vegetables by applying ecological practices, without chemicals or pesticides. In May 2007, with a small loan of Rs 3000, they carried out several activities to prepare the land such as clearing bushes, applying silt on the land from the local pond and ploughing the land with bullocks. Twenty five cart loads of farm yard manure (produced by their bullocks), which they had stored, was applied to the land. Maize, jowar, red gram, green gram, cow pea, cluster beans and some leafy vegetables were sown. Herbal solutions such as Jeeva Amritam and Panchagavya to enrich the soil, and herbal pesticides were applied when necessary. The crops were harvested and the family got six quintals of maize, 50 kg of jowar, 50 kg of red gram, 10 kg of green gram, 12 kg of cow pea and 5 kg of alasanda and different leafy vegetables. They kept most of the harvest and consumed it at home, and sold part of the maize. The crops yielded large quantities of crop residue to feed their animals. The loan was repaid in April 2008, by returning jowar and maize grain to the newly formed district federation.



When the family observed the crop-yield, and the potential crop-residues which would be obtained, they were inspired to purchase an indigenous buffalo. The family used to own buffaloes earlier, but sold them due to financial

hardships. Unable to arrange a loan to purchase an indigenous buffalo, Anthra agreed to extend a loan to the family to enable them to purchase a Pandharpuri type buffalo, which they bought in October 2007 for Rs 10,000. The buffalo calved a female calf immediately after purchase. The mother buffalo was grazed during the day and also fed crop-residues obtained from their fields - maize and jowar stover and husk from all the pulses. This was fed to the animal at the time of milking. During the first four months, the buffalo yielded an average of 2.5 litres of milk per day which increased to three litres by the fourth month and continued to yield three litres for the subsequent four months. Between the 7th and 11th months, the milk yield gradually declined to two litres, and then 1.5 litres per day. The family consumed half the milk at home, and sold about 1.5 litres of milk every day at Rs 12 per litre. The income from the sale of milk was approximately Rs 6570. The buffalo is pregnant again and the family anticipates that the buffalo's milk production will peak at four litres per day in its second calving.



The family also obtained a tractor load of manure from the buffalo, which is worth Rs 600. The buffalo calf is worth Rs 4000. The family has repaid half of its loan to Anthra, and will repay the remaining amount after harvesting their crops (in 2008 they grew cowpea, traditional maize, jowar, alasanda, red gram and vegetables).

The family is extremely satisfied that integrating local animals with dryland agriculture where they grow food crops, has helped them to eat more healthily and yet earn an income.

Community Managed Pandharpuri type Breeding Bull

Chennapur village in Shivampet Mandal has around 250 buffaloes. The only buffalo breeding bull in the village was an indigenous Pandharpuri-type, which was sold by its owner as it was very old. Thus there was no breeding bull left in the village. All the buffalo owners had to depend on one Gopal Mitra* from the same village to artificially inseminate their animals with Murrah semen. There were two major problems articulated by the farmers. The first was that farmers did not want graded Murrah calves, which naturally would be born if the females were inseminated by Murrah semen. The second was low rates of conception and thus the need to re-inseminate their animals 2–3 times to achieve conception. They were paying Rs 50 for each service. Even for those buffaloes that conceived there was huge mortality in the crossbred calves.

The farmers wanted a good indigenous buffalo breeding bull and said that they would maintain it. Anthra responded to this interest expressed by farmers, and had further discussions with them to evolve a strategy to translate this idea into action. Several rounds of discussions were held on issues such as who would maintain the bull and how would the farmers support its management. One farmer, Balreddy, volunteered to manage the breeding bull along with his other buffaloes. All the other farmers agreed to pay Rs 50 per service, or contribute five bundles of crop residue, which is equivalent to Rs 50, per service, which would help Balreddy feed and manage the bull.



Two farmers from Chennapur voluntarily agreed to purchase a breeding bull from the *angadi* (local market), or from neighbouring villages. Finally they identified a

*Government trained health worker

quality buffalo bull of Pandharpuri type breed characteristics, in a neighboring village. They asked the Anthra veterinary doctor to examine the animal and certify that it was healthy, and then purchased the bull in the last week of December 2007. It was purchased for Rs 10,000. Once again the insurance companies refused to insure a single animal, saying they could only insure animals if they were purchased through banks, or in units. The bull was transported to Balreddy's house who began to care for it. The farmers of Chennapur met again after the bull was purchased and discussed the management and use of the bull in detail. The buffalo bull arrived at an appropriate time which matched the peak season (winter) when buffaloes showed active signs of estrous. Between 10th January and 26th March 2008, the bull serviced 20 buffaloes and all conceived. Of the 20 buffalo owners, nine paid Rs 50 each and the rest provided five bundles of crop residue each to Balreddy. Thus all the farmers who utilized the services of the bull contributed towards its maintenance.

Balreddy is happy to maintain and manage the bull, as it benefits his own buffaloes, as also others in the community. He can utilize the dung to manure his fields where he cultivates a variety of food crops. He is also happy that the local breed of buffalo can be sustained through this simple effort. The problems of repeat breeding have stopped.

Seeing the success at Chennapur, villagers of Achampet asked for a Pandharpuri breeding bull, which is being managed by a Dalit family of the village on similar lines.

In all three situations, reluctance of insurance companies to insure local animals not purchased through banks or government programmes is a major lacunae that needs to be re-addressed.

A Beginning

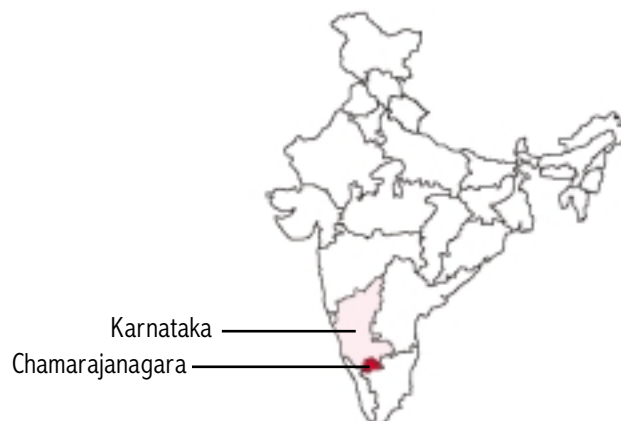
The above examples demonstrate the potential of how local breeds which are purchased on credit or loans do strengthen local livelihoods of extremely marginal households and simultaneously revitalize agriculture. This also plays a critical role in restoring biodiversity and building health environments.

Indigenous Livestock and Poultry Breeds



The Story of the Hallikar: Communities Securing Their Future

Organization - Sahaja Samrudha
Location - Chamarajanagara District, Karnataka
Year of Intervention - 2000 onwards
Communities - Indigenous livestock rearers' communities



Different livestock rearing communities play a major role in developing and maintaining indigenous cattle breeds. For centuries they have maintained the local animal genetic resources with great care. Modern crossbreeding strategies has jeopardized this entire age-old effort. The replacement of local breeds by exotics has resulted in genetic erosion of indigenous breeds.

Hallikar is one of the major breeds of Karnataka. The strains of this breed are maintained by different communities across Karnataka, especially in South Karnataka. *Kampaligas* and *Gollas* are some of the communities who maintain several strains of Hallikar. The *Beda Kampaliga* community located in the Kollegal forest villages, considers it their duty to take care of cattle. However, maintaining the breed is proving a problem to the community as the crossbreeding programmes run by government is diluting their efforts. The problems faced by the community include the following:

- Uncontrolled crossbreeding has been and remains a threat to the conservation of local animal genetic resources and populations.
- The importance and knowledge of local breeds amongst farmers seems to be declining.
- The community was not aware of the medicinal value of the products and by-products of cows

Sahaja Samrudha and its work

Sahaja Samrudha (SS) started as a farmer-initiated group to exchange and share ideas, seeds and knowledge on sustainable agriculture. The formation of Sahaja Samrudha was the culmination of the individual efforts of farmers to turn themselves into a more exciting and powerful force to make sustainable agriculture a way of life for the farming community.

The founders of SS have been working with farmers who were concerned with appropriate technology, soil, land, environment and health. Since its inception in the year 2000, SS has been establishing contacts, building networks, facilitating exchange of experiences and developing programmes based on the needs of farmers of specific regions. These pioneer farmers encourage other farmers to grow top quality produce and work in harmony with a healthy ecosystem, encouraging nature's

protective network of soil microorganisms and beneficial insects to help them farm successfully.

Many of the team members have been recognized at the state and national levels for their pioneering work. After six years in the field of organic farming, SS took a new path and got registered as a charitable trust.

In the area of livestock SS has been working earnestly towards the conservation of the Hallikar. Conservation of the Hallikar line has been initiated by working with the community that is engaged in cattle rearing. SS has initiated a most practical and economically feasible method recommended for conservation of Hallikar breed, i.e. *on-farm* conservation of live animals. This method of conservation was initiated mainly to enable the animal population to continue to adapt, evolve and also be selected for use in their natural environment. Recognizing the inter-dependence of people and the cattle breed on each other SS has initiated a participatory approach towards conservation. This method conserves not only the livestock, but also the traditional systems of which the villagers are a part. For the local community here, livestock plays a major role in their agricultural economy, culture and traditions. The community raises livestock for various needs—human nutritional requirement, economic, environmental, cultural and, most importantly, for various farming needs of the community. An intimate relationship exists between the rearer and the cow. Each is absolutely necessary for the existence of the other. The close association between the community and the cattle is rare and unique.

Towards conserving the breed

One hundred and eighty families in six villages enjoy the benefits of Sahaja Samrudha's work on livestock. The six villages are Kere Doddi, Yaragabala, Bylur, Arepalya, G.M. Doddi and Ardanaripura. All the villages are located under Lokkanahalli Hobli¹ in Kollegal Taluk in Chamarajanagara district of Karnataka State. Being the southern most district of Karnataka, Chamarajanagara

¹ Hobli is a cluster of panchayats. Each Hobli should have a population of more than 20,000.

borders the states of Tamil Nadu and Kerala. Kollegal is one of the larger taluks in India. It is situated at an average elevation of 588 mts. Since the town is on the foot hills of the western ghats, it has a mixed topography. Having a large area of forest cover, the district also has a high population of forest-dwelling tribes; prominent among them being Soligas, Yeravas, Jenu Kurubas and Betta Kurubas. It has beautiful lakes with a variety of water birds.

Uncontrolled crossbreeding has been and remains a threat to the conservation of local animal populations. SS initiated a participatory approach for conservation of a local livestock population (a) to maintain the purity of the breed; (b) to strengthen the inter-dependence of people and the cattle breed on each other, (c) to maintain the diversity (d) to serve as an insurance against environmental changes and (e) to guard against changes in production, socio-economic, and cultural conditions. Recognizing the community efforts in order to strengthen this indigenous institution SS initiated the breed conservation programme in collaboration with another community *Beda Kampaliga*. Though a new initiative of SS, the programme is also expected to enhance local community's capacity to address livestock production constraints, improve household income through sale of medicinal ghee and improve the breed to achieve higher productivity.



Planning the work

Sahaja Samrudha is involved in a traditional seed conservation programme and has been successful in developing the best varieties. The seed conservation was based on farmers' knowledge. As drylands have a symbiotic link between agriculture and livestock, integration

of livestock and agriculture is needed to remove all constraints of economic and ecological problems. On similar lines a programme was developed for local animal genetic resource conservation and enhancement. Anthra's training programmes showed the way to achieve it.

Process of Intervention

- The baseline survey in the project area highlighted the fact that the popular breed 'Hallikar' is reared by the local community.
- Another detailed survey gave information on the population of livestock as well as technical guidance and the economic approach the area needed.
- A meeting was organized with the community representatives and need-based strategies were planned.²

Participatory documentation of traditional knowledge associated with livestock

The legacy of our cultural heritage enriches our lives. Each generation has a responsibility to maintain and protect this heritage for the benefit of succeeding generations. Indigenous knowledge is the actual knowledge of communities that reflects upon the experiences based on tradition of the communities. These are an unwritten body of knowledge held with specific communities and passed on from generation to generation, through oral communication often losing the accurate description of the methods and process. Hence, there is an immense pressure on the people to collect, preserve and validate and most important, adopt these traditional practices. This helps the community to understand the value of their traditional wisdom that prevails. Under the programme, documentation was undertaken of healers, traditional health practices and breed conservation. The local

² Since we could not invite everybody in the village, only representatives of the village like elders, panchayat members or members of any local body were present during the discussions. In the discussions, need-based strategies pertaining to each village was planned. Need-base refers to that activity which is important to each village and which needs to be undertaken on a priority basis.

community has a culturally developed sense of guardianship of the Hallikar breed and this heritage should not be lost. So they were made the lead actors in all conservation and documentation efforts. It was both technically and ethically imperative to involve the community on a participatory basis and this has opened channels of communication with other breeders. The local rearers are confident to communicate and hold discussions with other groups. There is a better reach to other grassroot groups as the locals have taken a lead role. It is essential for the local community to be involved as they are the ones who have so wisely shaped and stewarded the breed, down the centuries with virtually no government support. Losing this unique resource would handicap them culturally and ecologically.

Training and awareness

Livestock management and sustainable agriculture training programmes were conducted for enhancing the farmers' skill in better management of natural resources. The trainings have prompted many farmers to adopt organic farming methods. Vermicompost units were constructed for better usage of the dung from the cattle sheds. Earlier the dung was wasted as it was never collected from the shed and due to this even the shed was unhygienic. The community was sensitized on a few guidelines of proper shed and health management and also on the importance and efficient utilization of the dung. The community now produces more than 15 tonnes of vermicompost annually.

Value addition

The community did not milk the cows, as they believed that the calf was the rightful owner of the milk. After the calf feeding, only the remaining milk was used for rituals or family needs. Ghee was prepared on a minimal basis and was consumed within the household, as reach to markets was difficult. The sheer distance to major markets is 4 hours to Mysore or Dharmapuri, 6 hours to Salem or Bangalore. Now, after the intervention, the women are encouraged to produce more ghee as the ghee of Hallikar cow has

medicinal value. As an economic support and to enhance the local economy the ghee is marketed in many organic outlets as medicinal ghee. The product has gained popularity among the urbanites.

Strengthening ethno-veterinary practices

The local animal health care practices were documented. The documentation was done by interviewing local healers and by testing the healers' practices. Later some of the proven practices were disseminated to the community. Documentation of local practices was done with an aim to strengthen the ethno-veterinary medicine, which is community-based local knowledge. The local knowledge is a rich repository that covers all aspects of livestock care. These practices are based on beliefs and the skill and methods of application pertaining to the inherent knowledge of the community. The knowledge within them is either transferred from the elders in their houses or learnt from the older generation through close observation. There are local healers who are knowledgeable and experienced in traditional veterinary healthcare, who use locally available medicinal plants for treatment of animals. Therefore, strengthening of these practices would keep the knowledge alive.

Introduction of cattle

About 10 farming households were identified and supported with finance for purchase of 10 Hallikar breed cows. Pure breed of Hallikar bulls were provided to two bull keepers for maintaining purity of the breeds.



Local breeds harbour genes for resistance against diseases, which are needed for maintaining the viability of animal production. Women very often prefer traditional breeds to improved ones, because the former require fewer inputs and are less prone to disease and therefore do not create any additional worry. Traditional breeds also help maintain income opportunities.

Fodder development

With the erosion of many traditional crop varieties from the region there is scarcity of fodder. Traditional varieties yield good straw for the livestock that is palatable. Due to the shift to the cultivation of high yielding varieties that do not yield fodder, there is a reduction of feed for the livestock. Reduced grazing lands due to forest conservation measures has created a major constraint in livestock production. The community is largely dependent on the forest for livestock feed but due to the restrictions imposed by the forest department, they face a lot of fodder shortage problems during lean periods. A programme was implemented in the project area to develop fodder resources. Fodder plants were introduced like Velvet beans, Glyricidia, Stylo hemata, Thespicia, Sesbania, Napier and some minor millet varieties for providing fodder for livestock.

Formation of Farmer groups to implement the work

Two farmer groups were initiated – 'Punakoti Savayava Krushikara Koota' and 'Hulikadu Savayava Krushikara Koota' for implementation of project activities.



Linkages with the Local Government Departments

The intervention was done through village level Farmer Groups *Punakoti Savayava Krushi Koota* at Kere Doddi having 28 members and *Hulikadu Savayava Krushi Koota* at Byloor with 42 members, formed during the initiation of the project. Each group has a bank account and they handle most of the transactions themselves.

The objectives of the group to initiate this programme were as follows:

- Conservation of local Hallikar breed.
- Developing a model for conservation of other local cattle breeds.
- Documentation of indigenous knowledge on Hallikar cattle breed and breeding practices in different communities in Karnataka.
- Increase public awareness on the value of animal genetic resources.

Linkages with the local government departments

As the conservation of Hallikar breed does not have a separate fund it was inter-linked with the Organic Farming Project funded by the Government of Karnataka. The project has extended support for distribution of cattle and fodder development. Vermicompost units were constructed for better usage of the dung.

Challenges past and present

- Non-support from the Animal Husbandry Department
- Unwillingness of banks to give loans to buy local animals
- Non-availability of quality bulls
- Encroachment of grazing lands
- Non-cooperation from forest officials
- The loss of traditional practices such as the community breeding bull or the “sacred bull”

The local rearers are now more confident to communicate and discuss with other groups. There is better reach to other grassroot groups as the locals have taken the lead role in conservation of local animals.

- Sensitizing the community on guidelines of proper shed and health management and also on the importance and efficient utilization of the dung. The community now produces more than 15 tonnes of vermicompost annually.
- Marketing the medicinal ghee to organic outlets in urban areas as a means to enhance the local economy.
- Strengthening of the traditional veterinary healthcare practices and keeping the knowledge alive. There are local healers knowledgeable and experienced in such practices. . They use locally available medicinal plants for treatment of animals.
- Women very often prefer traditional breeds to improved ones, because they require fewer inputs and are less prone to disease and therefore do not create any additional worry.
- Fodder plants were introduced

Problem areas to be addressed are as follows:

- Religious groups are misleading people to bring cows from Rajasthan and Gujarat for breeding. Some farmers prefer outside cow breeds rather than Hallikar. As they are larger in size and majestic in appearance, farmers believe that there will be high milk yield.
- Banks don't give loans to buy Hallikar cows or bulls
- Non-availability of financial assistance to the bull keepers / grazers from Government
- Non-availability of good cows and bulls
- Non-availability of financial support to carry forward this work
- Non-availability of support from Animal husbandry department
- Encroachment of grazing lands and grazing restrictions in forests

Success of the program

Reviving dying wisdom

When a baseline survey was conducted *Sahaja Samrudha* was able to study the situation of local cattle breeds in the region. The baseline survey highlighted 'Hallikar' as the popular breed that was conserved by the community. The village community, particularly tribal

groups had knowledge of veterinary practices and medicinal plants. Documentation of traditional veterinary practices and their experimentation were taken up, mainly to revitalize the existing knowledge and upgrade local breeds. The documentation made the local community realize the value of their existing knowledge. This instilled confidence in them to communicate and discuss with other groups.

This knowledge represents the successful way in which the community has dealt with the environment. Utilizing the existing knowledge can be used to find appropriate solutions for management of livestock health and also enhance the conservation practices of the community. Documenting and valuing the existing indigenous knowledge has helped in understanding the present situation, which allows for better communication between scientists and the local people.

Sahaja Samrudha played a key role in selection and distribution of animals to the community. The cattle of Hallikar breed was selected by a veterinarian and a local knowledgeable cattle rearer.

Link to Government programmes to sustain their livelihoods

In its organic policy, the Karnataka Government promotes organic agriculture in all the districts of the state. Organic agriculture seems to be emerging as an alternative to conventional agriculture. Improvement of the economy of the villages in the project area, which are characterized by poor resource base, needs an approach which focuses on sustainable use and management of their natural resources so that sustainable practices are initiated. The promoting agency supports farmers during transition in construction of vermicompost structures, distribution of saplings for promotion of agroforestry and so on. In the phase of soil rebuilding, farmers who are converting their farms to organic have taken to organic management techniques, such as planting of legumes and green manures, use of crop residues, mulches, application of animal manure, composts and other organic wastes. Revival of integrated farming system (IFS) and the ancient combination of livestock and crop

activities have helped the farmers to use the manure as fertilizer for crops, and the crop residues as feed for livestock. Through vermicomposting, manure of the livestock is used for crops wherein the manure is not wasted. Sahaja Samrudha has promoted home gardens and nurseries in most households depending on the space available. All home gardens have a vermicompost structure that adorns the garden and a variety of traditional vegetables.

Organic certification

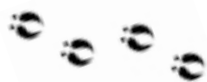
Sahaja Samrudha has introduced group certification for the farmers producing organically. This facilitation was undertaken mainly to ease the legalities problem for the small farmers and help the farmer benefit from organic markets. The certification agency is Institute for Marketecology (IMO), Switzerland. This programme has been linked with the organic farming project of the Government of Karnataka. Organic certification might not directly help livestock but it is an activity that has helped marketing of organic produce, including ghee that is processed from the livestock.

Exposure visit

For enhancing their knowledge the farmers were taken on an exposure visit to other farms and model farms where pioneer farmers have adopted techniques that demonstrate productive and sustainable use of their land. Exposure visit is an important event to enlighten farmers. The visiting farmers were able to replicate the sustainable agriculture techniques on their fields with technical guidance from the organisation. Exposure visit was a process through which the message, ideas and facts are conveyed to the farmer for their better understanding. This was also linked to the organic farming project of the Government of Karnataka. The expenses of the exposure visit were met from the organic village project.

Scope for its replication

This integrated farm and livestock programme concentrates on efficient management techniques in both livestock and crop production systems that ultimately result



in sustainable farm input management that has environmental benefits. The participatory breeding approach of both livestock and crop undertaken with the local community is a link for both research and on-field application. The communities are the actual researchers in the programme. The efforts of local community are conducted on-field and are demonstrated to an audience. The information gained is widely disseminated to other communities. The project focuses on the multiple benefits of genetic diversity. Hence there is great scope for replication. Sahaja Samrudha has distributed cattle and bulls to neighbouring villages in the project area.

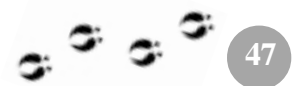
How the intervention is different from other livestock programmes

In the name of conservation, local breed animals are brought from North India. This is a common practice now-a-days. However, Sahaja Samrudha has not brought any animal from outside the project area. Animals are selected

locally for conservation purpose. Again, conservation of the Hallikar line was initiated with the local community, which is engaged in cattle rearing. *Sahaja Samrudha* recognizing the inter-dependence between people and the cattle breed has initiated a participatory approach that is the future of conservation. On-farm conservation was implemented in the area depending on the local need. The implementation strategies were developed based on the local community's choice. Community based management of livestock breeds is necessary as they are continuously being shaped and adapted to respond to changing ecological and economic conditions. It has the active support of the farmers who own and utilize these animals.



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Adapting to change: the Kathiawadi experience

Organization - Anadi
Location - Yavatmal District, Maharashtra
Community - Kathiawadi
Year of documentation - 2007



The Kathiawadi community of Gujarat is well known for their livestock rearing abilities. Spread over Gujarat they rear different breeds of livestock under pastoral migratory systems. In Surendranagar district they breed the internationally famous *Gir* breed of cattle and in Ahmedabad the *Vadhijar* breed. Some 35–40 years ago a group of these herders migrated to Maharashtra as conditions in their home districts were severe and there were immense fodder shortage.

The conditions in Yavatmal district of Maharashtra were very different from Gujarat. However in Yavatmal, fodder was available in plenty. The community made adaptations and changes to help their animals survive in the new environment. The study from Yavatmahal district describes the breeding strategies adopted by this group of Kathiawadis.

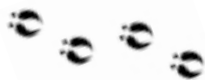
The original *Gir* breed from Gujarat is red in colour with round horns, long pendulous ears and is of average height. The milk yield is between five to 10 litres per milking. The Kathiawadis maintain that the milk has good keeping qualities. The original *Gir* cattle of the *Gir* forest cannot walk for long distances as it is bulky and its body is stiff.

The *Vadhijar* is whitish in colour with big long horns and is tall. However, the milk yield is only three to five litres per milking and the keeping quality of the milk is relatively low. The young male of this breed is a draft

animal. In appearance this animal is similar to the *Hariana* breed but does not have its whiteness.

After migrating to Maharashtra, the Kathiawadis found that agro-climatic and resource conditions in Maharashtra were vastly different from their native Gujarat. They began to introduce bulls from the local breeds to mate with their *Gir* females, so that the offspring would be better adapted to the local environmental conditions. This has given rise to a crossbred known as *desi Gir*, which is taller and lighter in colour than the original *Gir*, and according to the rearers, produces good milk, but it is more aggressive as compared to the more docile pure *Gir*.

The mixed breed called the *desi Gir or Maharashtraian Gir* has the following description: Whitish red in colour, high neck, big drooping ears, quick-footed, black spots on legs, long tail, big round horns and high forehead. The female has its first calving at 4 years of age. It has an inter-calving period of 1.6 years–1.9 years.



Feed resources too were vastly different in the two states. The fodder varieties available in Gujarat were bajra, maize, jwarikuti, kadau, sugarcane while in Yavatmal district, animals mainly depend upon grasses such as Pavana (*Sehima sp*), sefaru and pigeon pea.

Today the Kathiawadis have adopted the current feeding practices.

This well thought out breeding response of a group of migratory pastoralists is in complete contrast to our present day breeding programmes where breed transformation happens only for improving production yields, whereas the strategy of the Kathiawadi community has been to breed to adapt to changing agro-climatic and resource base. Their breeding strategy is of enormous relevance in the context of climate change concerns and this being a potential adaptation strategy.

Compiled and collected by Prashant Darvekar of Anadi Gramin Vikas Sanstha.



About Anadi Gramin Vikas Sanstha

Anadi Gramin Vikas has been working since three years in Yavatmal and Amravati districts of Vidarbha region of Maharashtra. Anadi mainly does community awareness activities in the field of education and also in social status improvement. It works in Karalgaon, Borgaon and Dhangarvadi (Mendhla) in Yavatmal District and in Pohra (Tapovan) and Chirodi in Amravati District. Karalgaon is situated at the foot of the Satpuda range, 10 km away to the north of the city. Borgaon and Dhangarvadi are situated in the north-eastern region. It tries to understand



the social problems of the communities, and helps them resolve problems.

The organization's work on livestock includes organizing training programmes for farmers on livestock diseases, their prevention and first aid, animal feeding, disposal of carcasses, negotiating grazing rights in forests through obtaining grazing passes and fees and drinking water facilities for livestock organised through the Panchayats. After its association with Anthra, the group is now working to enhance the availability of fodder, documenting and conserving local breeds, and documenting and promoting medicinal plants.



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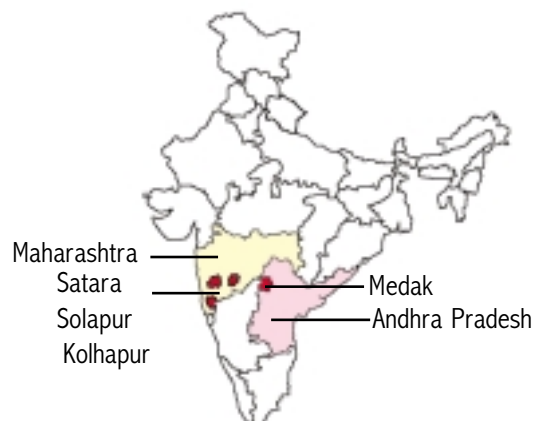
Pastoralists of the Deccan: Keepers of the Black Sheep Deccani

Organization - Anthra

Location - Medak district in Andhra Pradesh and Satara, Kolhapur and Solapur districts in Maharashtra

Year of Intervention 2004 onwards

Communities Pastoralists and Agro-pastoralists (both men and women)



The livestock species and breeds that evolved in the Deccan are an outcome of the dynamic interactions and relationship of people and natural resources and their mutual dependence on each other for survival. The Deccani sheep breed is found in the semi-arid Deccan tracts of Andhra Pradesh (Telangana), northeastern Karnataka and central Maharashtra. They are medium size coarse wool sheep with black being the dominant colour. It is ideally suited to the extreme temperatures of the Deccan and is a hardy breed adapted for long-distance migration in search of food and water, which is a necessary coping strategy of animals and the people who rear these animals in arid and semi-arid zones. The Deccani sheep is a key source of livelihood providing income, meat, wool and manure to shepherds across the Deccan Plateau in Andhra Pradesh, Karnataka and Maharashtra. The breed has been reared and bred by traditional pastoralist communities of the Deccan—Kurmas and Gollas in Andhra Pradesh, Dhangars in Maharashtra and the Kurubas in Karnataka. They have selected and bred animals true to the breed type over thousands of years.

Importance of the Deccani Sheep Breed

It is a short-tailed sheep and lambs thrice in two years. It is valued for wool, meat and manure. Sheep manure and urine has high nitrogen content which improves soil fertility. The shepherds in migration have mutual agreements with farmers for penning their sheep in farm lands for effective use of manure, thus enriching the soil. The farmer in turn gives rice, dhal and pocket money for their daily expense. It is a coarse wool-cum-meat breed and is unique worldwide because of its wool, which comes in various shades of black. The wool is important as it protects the animal from extreme temperatures and weather patterns which are typical of the semi-arid Deccan

plateau. In this area temperatures dip to 7 to 8°C in winter. In summers the temperatures often touch 45°C. The Deccani sheep wool is the source of the Gongali/Gonghadi/Kambali (a local blanket)—one of the most essential and multi-purpose traditional apparels worn and used by communities across the Deccan, particularly the pastoral communities. The black wool has also been the source of livelihood for shepherd women and in Maharashtra for special weaving communities like the Sangars who sort, card and spin the wool, with the men then weaving the black wool into the Gongali. In parts of Maharashtra in the districts of Satara, Sangli and Kolhapur wool has traditionally also been felted and made into floor throws and mats called jenn. Sheep milk is used in tea, or made into yoghurt, and butter milk.

The Deccani breed is closely intertwined with the culture of pastoralists of the Deccan, where they celebrate several festivals honouring the gods that protect their sheep—Mallana or Khandobha and Beerappa or Biroba in Andhra Pradesh and Maharashtra and Bomgondeshwar specifically in Narayankhed mandal of Medak and neighbouring regions of Bidar in Karnataka.

Anthra's work

Since 2004, Anthra has been involved in organizing the shepherds into village-level collectives (sanghams/gutts) and encouraging them to unite on a common platform to take up collective action to address their problems. Anthra facilitates a process whereby information and technical support reaches shepherds, and shepherds engage with and discuss strategies to improve the health of their small ruminants, preserve and protect local animal genetic resources, improve fodder availability, address issues related to access to key natural resources such as water, grazing lands and pastures and access services from the government veterinary health department. Shepherds strategise about ways in which they can assert their rights to resources using existing legislations as also discuss the need for newer policies/legislations. Far from being prescriptive, the strategy draws the community to identify their problems as well as work on possible solutions.

A major component of the work is mobilizing local communities to conserve the local Deccani sheep breed and Osmanabadi goat breed, native to the region and which play a critical role in the livelihoods and agriculture production systems of the pastoralist and agro-pastoralists of the Deccan.

In Andhra Pradesh, direct intensive community action involves about 400 pastoralist/agro-pastoralist families spread across 24 villages in Narasapur, Shivampet, Jinnaram, Hathnura and Narayankhed mandals of Medak district. Extensive mapping of the district and the state has revealed that the first four mandals along with Veldurthy in Medak district are amongst the handful of remaining geographic locations in the state which continue to have significant numbers (>85 per cent) of the total sheep population of 'pure Deccani breed population'. There is a total population of about 20,000 sheep and

7000 goats in the focused villages with the following genetic composition:

Table 1 Genetic composition of animals in Medak district

No of Villages (per cent of total)	Pure Deccani Flocks (per cent)	Mixed Flocks with Red Nellore / Jodipi breeds (percent)
5 (22)	100	-
7 (26)	90–95	5–10
7 (26)	80–85	15–20
4 (16)	70–75	25–30
1 (10)	50	50
Total- 24		

Narayankhed mandal along with almost all other parts of Medak and traditional breeding tracts in Andhra Pradesh have witnessed between 50–100 per cent conversion of the black Deccani to with Red Nellore and/or Jodipi.

In Medak district, except for Narayankhed where shepherds migrate for 9–10 months a year, the other areas comprise stationary flocks with limited and short-distance migration. In Medak, women do not accompany the families on migration, and stay back to look after the fields and other livestock.

In Maharashtra, community work in the three districts of Satara, Solapur and Kolhapur is focused in the seven taluks or blocks of Phaltan, Mann, Khandala, Koregaon, Malsiras, Hatkanangale and Sirol where 410 pastoralists who belong to 22 gutts or groups, owning about 20,611 sheep and 10,000 goats are actively involved. In Maharashtra too the Black Deccani breed is under significant pressure, as is evident in the distribution of the breed in the taluks where Anthra works.



Table 2 Distribution of Deccani Breed in Satara and Kolhapur Districts

District	Taluk	Breed type
Satara	Phaltan	White Deccani, Sangola Deccani, Madgyal crosses
Satara	Mann	Madgyal , Very few white Deccani
Satara	Khandala	Lonand type Deccani and Madgyal
Satara	Koregaon	Lonand type Deccani and Madgyal
Solapur	Malsiras	Sangola type Deccani and Madgyal
Kolhapur	Hatkanangale	Black Deccani
Kolhapur	Sirol	Black Deccani

The Deccani is the breed of choice for migratory communities and migration is almost inevitable for people of these districts which are semi-arid with as low rainfall as 200 mm per year in Mann block. Interestingly the shepherds of Kolhapur migrate from their villages in the monsoon. Kolhapur is heavily irrigated and is under sugarcane cultivation. During monsoons shepherds prefer to migrate to adjoining 'dry districts' where pasturage is better.

Often the entire family migrates for 6–10 months in a year. Women, children, horses, cattle, poultry, all embark on the long march of over 300 km in search of pasture and water.

Why Are We Losing the Deccani ?

Several factors have resulted in the rapid decrease of the breed in its traditional breeding tract. The breed is being rapidly out-crossed with other non-wool—primarily meat—sheep breeds. If in Andhra Pradesh it is the Red Nellore, in Maharashtra it is the Madgyal and in Karnataka it is the Yelugu that is being used for this. All three are relatively heavier, non-wool sheep breeds.



Discussions with shepherds in different parts of these states clearly point to an intensification of the rate of loss during the past decade. In Andhra Pradesh this seemingly 'conscious' decision of shepherds to replace their Deccani breeding rams with Red, White or Jodipi Nellore rams can be traced back to mid-1990s, when two major factors came into play:

- i) The declining wool markets, where the coarse wool was suddenly out-priced from the market, which was flooded with cheaper imported 'shoddy' wool products. The collapse of the wool market is a consequence of skewed macro-economic policies that promoted large scale imports of cheap merino wool from Australia and Europe, causing local markets to be flooded with shoddy wool products priced far lower than the coarse Deccani wool products.
- ii) The proactive efforts by the state animal husbandry department to encourage shepherds to replace their Deccani breed with heavier non-wool sheep breeds. In Andhra Pradesh shepherds had direct access to subsidised loans through shepherd cooperatives, where they purchased Red Nellore rams.

While the wool markets have played a similar role in the decline of the breed in Karnataka and Maharashtra, steep increase in the demand for mutton has also prompted shepherds to opt for meat breeds rather than wool. Irrigation and dams have placed restrictions on migration, and are another reason for shepherds changing their breeds.

In Maharashtra researchers have also traced the manner in which British scientists, while setting up the sheep and goat research station in Pune in the early part



of the previous century, introduced temperate wool breeds of Europe into the breeding tract.

Another critical aspect has been challenging the considerably distorted scientific view and understanding of the Deccani breed amongst the established and influential scientific research institutions. They view the Deccani as a 'white coarse wool breed' and not as a 'black wool breed'. Regrettably, most research studies and publications on the Deccani have emerged from an isolated pocket in Maharashtra, where phenotypic descriptions talk of a predominantly 'white strain' of Deccani known as the Sangmaner whereas 'black' is the dominant colour of Deccani flocks across the other two states and many parts of Maharashtra. There have only been limited, if at all there were any, efforts by mainstream scientists to document and describe these black sheep flocks in its wider geographic spread. If this is further delayed it may just be too late.

The flip side of the shift is that the mixed breed is often more susceptible to diseases and less capable of coping with long migration. These non-local breeds, being heavier, require greater quantities of feed and fodder. Shepherds unfailingly point out that these new sheep breeds feed for longer hours, and they have to move longer distances to meet their nutritional requirements, as compared to the Deccani breed. The expected gains from heavier sheep is offset by the increased expenditure on the health care of these cross-breeds, whose immunity frequently gets compromised due to insufficient feed, and the absence of a protective wool cover. Breeds like Madgyal have also been found more prone to diseases like orchitis in male breeding rams.

Supporting the 'Keepers of the Gene'

Having identified the critical 'gene pools' and the communities who are 'keepers' of these gene pools and whose livelihoods are interwoven with these breeds, Anthra, along with the community of Deccani breeders are putting in all efforts to conserve, sustain and rebuild this disappearing breed using multiple strategies.

The key strategies used by Anthra, to catalyse and enhance collective interest and commitment amongst

shepherds to continue to rear the Deccani breed range from community level actions to research, development and advocacy.

- i) Village level campaigns on the importance of the Deccani breed
- ii) Annual Deccani Breed Competitions from village to district
- iii) Research on village Deccani flocks to map and describe the breed according to shepherds' perceptions and knowledge as also to closely record phenotypic, reproductive and productive parameters of the village flocks.
- iv) Encouraging shepherds to select best lambs as Deccani Breeding rams, which are then sold to other shepherds interested to replace their non-Deccani rams.
- v) Community fund for pastoralists, managed by women shepherds, where loans are made available to assist shepherds in purchasing Deccani rams.
- vi) Revitalising wool-based livelihoods
- vii) Forming an Anthra-owned Deccani flock which is reared in the village condition, where all the 'best management practices' can be applied and demonstrated to other shepherds.
- viii) Advocacy with scientists and policy makers

Campaigning on the Move

Shepherds are informed about the importance of the Deccani breed through village level meetings, where sangham/gutt activists and volunteers facilitate discussion forums where different aspects of the breed, its loss and its importance, and its historical, cultural and livelihood significance are discussed. Song, dance, theatre, books, short films and posters are used to spread the message and raise awareness amongst women and men. Elderly shepherds, who are experts on the Deccani breed, participate in these meetings and share their knowledge and engage in fascinating debate on the how's and the why's and the ways forward with younger generations. The loss of the Gongadi, and the fact that nothing can ever replace it, often becomes a rallying point. Women in particular have begun to take the lead in persuading their husbands to sell the Red Nellores and Madgyals and replace them with Deccani rams.

Celebrating the Diversity of the Breed

Deccani breed competitions are held from village to district level. These have become a community strategy to map the spread and extent of the breed, and arrive at a deeper realization on communities' understanding and perception of desirable traits in the breed. Based on this, 'best animals' in different age categories are identified. Also identified during these competitions are excellent breeders of the Deccani. A database on different phenotypic parameters of the breed and their genetic variation between villages is prepared. Finally, these competitions are also used as a way to celebrate possession of and invoke pride in the Deccani breed amongst the community. Officers and scientists from the government animal husbandry department and research institutions such as the National Bureau of Animal Genetic Resources (NBAGR) are invited as judges to such events, and are sensitized to the local realities. Finally it is an occasion for larger public awareness and education and thus feeds into policy advocacy.

In Andhra Pradesh this initiative began in 2005 at the district level. About 130 shepherds from 10 villages participated in this. Experienced shepherds and veterinary officers from the local animal husbandry department in Medak judged the animals and selected the best breeding ram, ewe and lamb. The event simultaneously included judging of the local goat breed which is a magnificent Osmanabadi type one. All those who participated were presented with booklets on sheep and goat management and the winners received shields. This event generated tremendous interest amongst the shepherds who began to reflect on the appropriateness of encouraging non-Deccani breeds in the region.



The second judging competition was held in December 2007, and this time around it was on a larger scale, beginning with village level judging of all village flocks, and then the finalists from all villages, competing at a district level final judging event. The village level competitions were organised in 20 villages, where experienced senior shepherds judged the animals, coupled with each competing animal being measured for basic physical parameters such as height, weight and wool characteristics. A combination of both sets of information influenced the final selection of best ram, ewe and lamb at the village level. A total of 244 shepherds participated with their animals at the village level competition, and 76 breeding rams, 214 adult ewes and 75 lambs were judged. Thirty nine breeding bucks, 65 breedable does and 17 kids were judged in the Osmanabadi goats section. The final judging competition saw 120 shepherds with 76 finalists (25 rams,



23 ewes and 28 lambs) who won at the village level, compete in the district finals. An additional 25 shepherds from some new villages entered their animals in the finals, as they heard about the competition, and wanted their animals to participate! In the final event experts from the local animal husbandry department, independent scientists, scientists from the NBAGR along with experienced shepherds judged the animals. Over 400 shepherds from 30 villages came to participate in this glorious event.

The mean physical parameters recorded at the village level and at the finals of the competition were pretty comparable with the average data for the Deccani available in the scientific literature (Table 3)

Table 3 Mean Body Weight of Deccani Sheep Breed from Finalist Data (December 2007)

Average of Village Level Competitions	Mean Body Weight (kg)		District Level Finalists (Average of first three)	Mean BodyWeight (kg)
Deccani sheep			Deccani sheep	
Ram (4 teeth)	41.15	I	Ram (4 teeth)	43.6
Ewe (4 teeth)	33.42	II	Ewe (4 teeth)	36.0
Future breeding ram		III	Future breeding ram	
3 months	14.14		1.6 months	15.0
4 months	18.75		4 months	18.0
9 months	27.40			
1 year	30.80			31 kg

Competitions were initiated in Maharashtra in 2007 and were held again in 2008 as an annual event in both the Satara and Solapur regions of Maharashtra. Over 140 shepherds participated in both events with about 218 animals participated in the first round. At the district level finals there were 56 animals which were judged in the different categories. While in the first year the animals which entered the competition were more from a mixed category in terms of breed composition, in the second year much better animals have entered the competition. The mean weights of breeding rams and ewes at the village level are summarized in Table 4.



Table 4 Mean Weights of Breeding Rams and Ewes at the Village Level (August 2008)

Sr. No.	Age Group	No. of Ewes	No. of Breeding Rams	Average Weight (kg) of Winner Rams in Respective Categories	AverageWeight (kg) of Winner Ewes in Respective Categories
1	2 teeth, 4 teeth	60	31	37.79	33.4825
2	6 teeth and above	102	30	46.86	38.5825

These events have proven to be a resounding success in multiple ways. Pastoralists themselves are extremely enthusiastic and a winning animal from their village is considered an enormous source of pride. Already in one year we see the shift towards better quality animals being identified. Many shepherds from the sanghams/gutts who owned Nellore or Madgyal breeding rams, have come forward to change the rams and replace them with Deccani ram from other villages in their area. The competitions have created a lot of interest about the local breed amongst shepherds and the wider community. Shepherds also were

able to gauge the potential of the breed, while they listened to experienced elderly shepherds and scientists. The competition has generated baseline data of the Deccani sheep and Osmanabadi goat breed for planning future breeding strategies to conserve the breeds. The competitions facilitate a thorough understanding of ways in which shepherds traditionally select sheep and goats. It has also evoked interest amongst the scientific community, to take a re-look at the breed. Shepherds in Andhra Pradesh and Maharashtra have begun to demand that Deccani rams be distributed through government

programmes such as Jeeva Kranthi¹. The raw data generated also indicates the potential for selection as a tool to improve and develop the breed both for its wool and meat purposes.

Towards Describing the Deccani Gene Pool

In addition to the wealth of information generated through the Deccani breed competitions, a focused one-year study from March 2007 to March 2008 was initiated with select sheep flocks in Medak district AP, Phaltan Taluk in Maharashtra and Karnataka state. The study aimed to document the breed as perceived and described by local shepherds who breed the sheep, and understand their traditional management and breeding practices. It also included monitoring and recording the growth and reproductive performance of the breeds and its genetic variability. The flocks were studied in relation to their morphological, reproductive and productive parameters. Various parameters including body weight, height, girth, lambing, etc. were recorded through the year at quarterly intervals. Apart from quantitative data recorded, detailed qualitative data was recorded using techniques such as direct flock observations, semi-structured interviews,



focused group discussions and photo documentation. The different aspects researched included the traditional ways in which shepherds identify their animals, methods of selecting future breeding rams and ewes and care and management of

animals in their flock. Wool was sampled and sent for testing. Grazing practices were also recorded.

¹ A programme was initiated in Andhra Pradesh by the Department of Animal Husbandry in 2007–08 to distribute breeding rams, ram lamb units, sheep and goat units to weaker section families in rainfed regions. An amount of Rs 2 crore was utilised in 2007–08. In 2008–09 the budget was 27 crore. Breeds to be distributed were Red Nellore, Maharashtra Deccani, Native Deccani, Bellary, Madras Red and Osmanabadi goats.

The study revealed that shepherds have extremely unique ways of identifying their animals based on sex, ear size, body markings, wool colour, horn type and age. They have very specific parameters based on which they select young lambs as future breeding rams, and ways of identifying the best ewes. Most shepherds select the breeding ram from their own flock and prefer lambs that are born in the September–October lambing as abundant fodder post-monsoons favours good growth. Maximum lambs are born in this season, and shepherds have a larger group to select from. Shepherds select the ram lamb as a future breeding ram, when it is about six to seven months old. The traits/characteristics observed by the shepherds for a future breeding ram include the weight and size of the ram lamb, its thighs, legs and rump, its horns which they prefer to be aligned close to either side of the face, pointing slightly outwards. In addition they examine the ears, eyes, wool, overall appearance and also observe the mother's traits such as milking ability and udder size, as also its ability to mother the lambs. Most of the shepherds prefer black ram lambs, as this conforms to the dominant colour of the Deccani flock. They believe that the black wool on the body of the sheep is important so that the sheep can withstand disease. When a breeding ram is selected from another flock, they look at the general appearance of the animal, wool character, legs, loin strength and width, chest and history of disease and then compare all this to the price being quoted. They also find out about the season of lambing.

When they select ewes, they look at the general appearance, conformation to the breed type, weight, size, udder, as also factors such as milk production, growth of lambs, disease history and mothering ability.



The quantitative data revealed that in all flocks there is a steady increase in body weight up to two years of age. Thereafter the animal reaches its full body weight, and there is very gradual weight gain. There is also appreciable variation between flocks. Wool samples from the flocks were collected and analysed.

Wool is sheared twice a year. While in Andhra Pradesh (AP) the wool is sheared in April and October in Maharashtra it is done in August and February. Interestingly, in AP the shepherds find that the wool yield, quality and smoothness is better in the second shearing in October, but in Maharashtra shepherds say that they obtain these qualities in the first shearing.

The mean wool fibre diameter and fibre length of Deccani sheep breeds in different locations in Andhra Pradesh and Maharashtra was as follows:

Table 5 Mean Wool Fibre Diameter and Fibre Length of Deccani Sheep

State	Location	Wool Diameter (microns)	Wool Staple Length (cm)
Andhra Pradesh	Narsapur	45.09	3.62
Maharashtra	Narayankhed	50.04	5.44
Maharashtra	Kolhapur	45.52	2.55
Maharashtra	Solapur	51.47	3.59
	Satara	51.65	3.4

The analysis reveals how finer wool is available in Narsapur and Kolhapur, which correlate to the geographic regions which have the largest proportion of pure Deccani sheep with minimal presence of other breeds. It is clear that as the dilution of the gene pool occurs, the quality of wool declines. This information is widely disseminated to the rearers through the sanghams or gutts, which helps them to understand their animals.

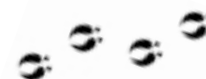
Replacing Non-Local Breeds with Deccani Breeds

In 2006–07 10 shepherds from five villages sold their Red Nellore rams and purchased Deccani rams. In 2008, five women shepherds from three villages (three from



Gangapur village, Narayankhed mandal, one from Peddagottimukala, Shivampet mandal and one from Gudemgadda village, Narsapur mandal), decided to take loans from the Community Shepherds Fund to purchase Deccani breeding rams. An Andhra veterinarian, field researcher and an experienced shepherd initiated the process by selecting 10 breeding rams from four villages namely, Nallavalli, Chippaldurthi, Chennapur and Borpatla. They were distributed to the shepherds who requested rams, through the women shepherds' sangham and the community fund.

In Maharashtra four shepherds decided to sell their Madgyal rams and replace it with Deccani breeding rams. One shepherd was from Hatkanangale block, Kolhapur, the second from Nitwewadi village, Malsiras block, Solapur, the third and fourth from Kothale village, Malsiras block, Solapur district.



Practice What is Preached: Demonstration Anthra Deccani Flocks!

Both in Andhra Pradesh and Maharashtra, Anthra is managing its own flock of Deccani sheep, which have been collectively purchased by interested staff members. The objective is to conserve the pure breed and also to demonstrate and apply the best management practices in the flock, which can then be observed by other shepherds.

In AP the flock consists of 20 Deccani ewes, one Deccani ram and 7 lambs. An experienced shepherd, Kurma Ramulu from a sangham village Chippalthurthi, Narsapur Mandal, volunteered to manage the flock. He will receive half the offsprings of the flock, as per traditional sharing *vaata* agreements in the region.

In Maharashtra Shri Nyandev Abba Nitwe of village Nitwewadi of Malshiras block in Solapur district, is managing the Anthra flock consisting of 21 ewes, one breeding ram and six lambs. This flock is called the Nira flock named after the Nira river which flows close by. Here too the arrangement is on the sharing or *batai* system where the shepherds will receive half of the lambs born in the flock.

The shepherd is trained on disease and general management, first aid using homoeopathic medicines and herbal preparations to treat common diseases such as diarrhea, cough and cold, foot rot and wound healing and have been trained on lamb care management. Some of the practices being applied include construction of a simple



'foot bath' at the entrance of the shed, to prevent and treat foot rot, keeping the lambs in the shed till they are three months of age and stall feeding them with nutritious fodder leaves, as also offering them salt licks, cleaning and regular smoking of the shed. Like all the other sheep, these too are protected against the common diseases and regularly dewormed.

Revitalizing Wool-based Livelihoods and Linking This to Local Markets

Both in Andhra Pradesh (AP) and Maharashtra the gongali (blanket) continues to be the most popular product woven out of the wool. However in AP, there has been a huge collapse in the wool markets in terms of linkages between shepherds' wool reaching weavers and the few remaining cooperatives that continue to process wool. Maharashtra, however, continues to have a relatively vibrant wool market particularly in the districts of Solapur, Kolhapur and Satara. In addition, felting is commonly done particularly by a community known as 'Nadafs', and wool continues to find a market to produce the 'jenn', a popular felted product. These markets are also a central hub for shepherds to meet, share information and fix marriages. Anthra has set up an office in one of these small towns called Natepute. In Maharashtra at this point, Anthra's work with wool is currently focused on studying the markets before embarking upon any further interventions.

The situation in AP is quite desperate and different. Therefore, a pilot initiative in Medak district to infuse new energy and vibrancy into the dying wool-based livelihoods has become an important forward linkage to stimulate an interest in shepherds to sustain the breed, particularly with respect to its wool characteristics. Efforts are being made to spread the information to the villages, and identify those who were still engaged in some form or the other with the wool-craft. There are elderly men who are still involved in spinning thread to make their own gongadis. Others continue to painstakingly create beautiful woolen borders for gongadis. On special request some weavers continued to weave gongadis and women continued to card and spin wool in small quantities. They are, however, purchasing wool from Karnataka!

The ironic tragedy is that in the same geographic region there is no one to 'buy' the wool at the flock level and the shepherds throw the wool into their fields and use it as compost. Those who continue to process the wool, however, purchase the wool from outside! One of the few remaining wool cooperatives, involved in production and marketing of woolen gongadis, was also desperately in search of spun wool. Keeping all these issues in mind, in June 2008 over 85 men and women from seven villages comprising a lot of elderly men and women along with some younger women, who did not go out to work as agriculture labour, came together to draw up a plan to revitalize the craft. Some of the issues discussed included:

- i) Conducting a participatory exercise to rank wool and fix a reasonable price to purchase the raw wool
- ii) Identifying possible wool products which had a potential demand in the local market
- iii) Kickstart the process by purchasing wool from shepherds in the region, and distributing it to the interested persons who would clean, card, spin or felt the wool and then make the products
- iv) Training on specific skills such as felting and production of felted products
- v) Access expertise to assist in the process

Shepherds have begun to separate the wool at the time of shearing sheep and sort the wool according to colour and age. An initial quantity of wool was purchased, cleaned, carded and distributed to elders who have begun to spin this wool into thread. Other youngsters are involved in felting wool to make products such as warm caps and files. Still in its early stage, it goes without saying that rebuilding the wool markets plays an important role in reviving and protecting the Deccani Breed.



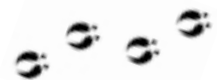
Influencing Policy Makers and Researchers

Influencing Policy Makers and Researchers is an extremely important element of conserving indigenous breeds including the Deccani. Strategies include sharing field-level experiences through local, state, national and international level seminars, conferences and workshops, disseminating information through publications and the media, and a proactive effort to engage and debate with scientists and research institutions, in the hope that they will finally make this their concern as well. A National Seminar on Sustainable Use of the Deccani Breed in February 2007 and the Anthra's participation in the Intergovernmental Animal Genetics Conference organized by the FAO at Interlaken, Switzerland in September 2007 are two such efforts in this direction.

Our efforts are not in the search of obtaining patents on genes and IPRs but to join hands in the most critical objective of ensuring that the communities who breed and rear these breeds are genuinely empowered to do so, which is finally what matters in the discourse on 'Conservation of Breeds'

Need to Nurture Small beginnings

The collective effort has undoubtedly generated local and national interest in the Deccani, with several concrete steps having been taken by the local communities in resisting and halting the erosion of the Deccani gene pool. However, efforts of a few NGOs and committed shepherds to conserve and sustain these threatened breeds for today and future generations is insufficient without the wholehearted support of scientists and governments to assist communities in this uphill battle.



Reclaiming Endangered Livelihoods: Untold Stories of Indigenous Women and Backyard Poultry¹

Organization- Girija Deepika and Tholakari
Location - East Godavari district, Andhra Pradesh
Year of Intervention - 2002 onwards
Communities- Adivasi farmers- Konda Reddy, Koya dora, Konda Kamhari



Indigenous women of East Godavari district, Andhra Pradesh, are unique in that they have over generations protected and bred the world-famous Aseel poultry and other local varieties. The birds managed under backyard systems contribute crucially to women's livelihood, and are of critical cultural importance in the lives of indigenous communities. A combination of factors resulted in the fast decline of Aseel poultry populations in its home-tract in the early 1990s. In the past decade, women have responded through multiple collective actions to re-establish ecological and diverse cropping, which provides vital crop by-products, as feed for the poultry, apply modern and indigenous health care and management practices to prevent and control diseases, and innovate traditional systems of asset building, all of which have helped to restore and sustain the breed, women's livelihood, as also rebuild biological and cultural diversity.

Introduction

The Aseel poultry breed is an important indigenous breed of India. It has probably been selectively bred by the local indigenous communities – the Konda Reddy, Koya Dora and Konda Kamharis living in the forests of the Eastern Ghats in Andhra Pradesh, from the original Red Jungle Fowl (*Gallus gallus*) that lives in the forests. The latter has been recognized as the ancestor of many of today's modern domestic poultry breeds world-wide (Gopalakrishnan and Lal, 1985). Women are primarily responsible for the care and management of the bird under backyard poultry systems. It is also the only 'resource' which is completely owned and controlled by women from

the moment of selection of the bird to sales and purchase and control over the income earned from the birds (Anthra and Girijan Deepika, 2000).

As reported earlier (Ramdas and Ghotge, 1998), there are close to eight different strains and sub-strains that are recognized by the communities in the area² such as *Nati kodi*, *Shankar jati kodi*, *Geesa Kodi*, *Medajari kodi*, *Rencha kodi* or *Agees kodi*, *Denki kodi*, *Mattedu kodi* and *Juttu kodi*. Amongst all, it is the Aseel that has historically been the breed of choice, valued for its tasty meat, its cockfighting abilities and its agility and ability to escape predators that are frequent in forest regions. The Aseel has a short and broad breast, straight back and a close

¹ This paper (excluding the case studies) authored by Dr Sagari R Ramdas was originally published in the "XXIII World's Poultry Congress 2008. Congress Proceedings. June 30th-July 4th 2008, Brisbane, Australia".

² The region refers to those parts of East Godavari district, Andhra Pradesh, India, which are inhabited almost exclusively by indigenous Communities

setting strong tail root. The outstanding feature of this breed is the thick and long neck, long and slender face without feathers, short beak, short and small comb, ear lobes and the absence of wattles. The legs are long, strong and straight and the bird has an upright and majestic gait. The plumage colouring is brilliant and the Aseel cock comes in many colours: typically *Dega* (red plumage), *Reza* (golden and red spotted plumage), *Massara* (blue black), *Poola Massara* (spotted), *Savala* (white and black spots), *Kaki* (pure black), *Petta maru* (hen-like colouring) and *Settuva* (white). The preferred colours are *Dega*, *Reza* and *Massara*. (Girijana Deepika *et al.*, 2002). The average weight of a 2-year-old full size adult male ranges between five to eight kg. The average weight of a hen is three to four kg.

The Aseel have been traditionally bred for its meat quality. With 36–60 eggs laid per year, the Aseel is not a prolific layer. The hen matures and begins to lay eggs between five to six months of age, and lays three to four clutches per year each having 10–12 eggs. It is evident that women are primarily interested in producing live birds, and not eggs. Studies have indicated that 95–100 per cent of total eggs laid by a bird in a year are kept to hatch. There is higher consumption of eggs during summer (May) as high ambient temperatures leads to higher deterioration of eggs. Of the live birds that hatch and survive, between 60–70 per cent are sold, 15–20 per cent are consumed at home and the remaining 10–15 per cent kept as breeding stock to increase the flock (Ramdas and Ghotge, 1998).



Empowering Local Cultural Traditions

The strong, pivotal role that women and poultry play in the lives of indigenous communities and the positive image of women is beautifully captured and reflected through proverbs and metaphors:

'Tholasuri aadapila puttale, tholakari korasene aina veyale, korakothaku kollu koyale.'

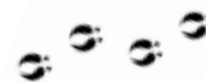
May your first child be a girl, may you sow *Korra* (a millet), as your first crop, and may you offer a poultry bird in thanks giving to the gods, when you harvest *Korra* crop.

'Kodi thinnadi, Kodala thinnadi, lekka ki radhu, ekadiki podhu' which translates to 'What the chicken eats, or what a daughter-in-law eats should never be measured or counted as they only multiply wealth in your home, which remains with you.' In local cultural context this means that both will bring good luck and prosperity to the home, and one should never grudge the expenses incurred on them.

And again *'Kolanu ammina dabbulu, kodaliki eruka'* which states that only the daughter-in-law knows the amount earned from the poultry in the house!

Or in this proverb which reveals the bonding and friendship between women and birds, *'Raitamma ki nidra lepyedi kodi'*, where the proverb speaks of how the woman farmer is awoken each morning by the poultry bird!

These are culturally and sociologically extremely significant, particularly in a global context, where in a majority of societies gender-discrimination continues, and there is an overwhelming preference for boys even before the girl-child is born.



Culturally, poultry are an essential pre-requisite to celebrate important festivals of indigenous communities. Worshipping the ancestors and the forest gods prior to sowing the new crop and at harvest of each crop (locally known as *kotha*), has to be accompanied by sacrifice of a poultry bird. The bird is also traditionally used in the popular cockfighting sport that peaks in January, which is the month of the popular harvest festival *Shankranti*. The regular cost of poultry meat in the local market is Rs 140 per kg.³ During *Shankranti* the cost of a live bird ranges from Rs 1500 to Rs 3000. When relatives visit each other having chicken on the menu is a sign of respect and courtesy. Poultry birds also are an indispensable part of the 'bride-price' when marriages are negotiated.

High Production Losses and Prevention Strategies

In 1996 participatory rural surveys in villages revealed that while the potential annual earnings from an adult hen was Rs 4,000 after accounting for acceptable losses, in reality the farmer was earning less than half of this due to production losses resulting from egg spoilage or infertile eggs (63 per cent) and chick mortality (37 per cent) which was largely due to predators, fowl pox and salmonellosis. The average annual mortality amongst the village poultry population ranged between 70–80 per cent and was primarily due to diseases such as Ranikhet (New Castle disease) and Salmonellosis/Bacterial white diarrhea. This translated into an average annual monetary loss between Rs 30,000 and Rs 50,000 in every village. In a livelihood scenario where every adivasi family is steeped in debt ranging from Rs 4,000 up to Rs 50,000, this loss was recognized as critical. Preventing the loss was clearly one of the ways to prevent indebtedness amongst indigenous communities, and strengthen local livelihoods. (Girijana Deepika *et al.*, 2002; Ramdas, 2001).

The key prevention strategies included improving the availability of village health care services by training village animal health workers, building women's capacities to



effectively manage and feed their poultry, enabling women to access regular preventive vaccinations from the government services, encourage local systems of asset creation known as *vaata* and strengthen local marketing systems. Improved feeding was hoped to be achieved by rebuilding local agricultural practices and crop diversity (millets, pulses and oil seeds) thus providing poultry a more balanced and nutritious diet, based on the by-products of traditional crops. A preliminary assessment of the strategy which was initiated in 1996 was carried out in 1998–99. It was found to have extremely positive impact at household level resulting in enhanced consumption of chicken and increased income to the family. At a community level there appeared to be higher availability of Aseel poultry and an upward trend in Aseel poultry population. Finally, this was strengthening women's livelihoods and food sovereignty (Girijana Deepika *et al.*, 2002; Ramdas, 2001) at the household level.

An attempt was made to evaluate the impact of these interventions over the years between 1998 and 2008, to understand the long-term impact of the strategy on people's livelihoods, food sovereignty, the Aseel poultry population, as also its cultural significance.

Methods

The original work with the Aseel poultry in East Godavari district was collectively undertaken by several individuals from four organisations⁴. By January 2008, the *Womens Gottis*, had organised themselves into a collective known as the *Tholakari Adivasi Mahila Vedika*, with a membership

⁴ The four organizations were Girijana Deepika, a local organization of indigenous communities, Anthra, Yakshi and the Women's Gottis.

³ 1 USD = Rupees 39.6 (Feb 2008)

of 1800 women spread across 80 villages. In 2002, the organisation *Anthra*, that had provided veterinary, animal husbandry and ethno-veterinary technical support in the early years, stopped being directly involved in the day-to-day implementation strategy. The impact study was carried out in collaboration with *Tholakari* in sample villages where the collective is present.

Participatory Rural Appraisal (PRA) and other socio-cultural survey methods such as semi-structured interviews, focus group discussions, sample case studies and key informants, were used. These were carried out with women from 68 villages, which was the membership base of *Tholakari* as of November 2007. In addition, in-depth village case studies of three villages were carried out, which attempted to capture both quantitative and qualitative changes at the level of household and community. The selected villages included two villages which had been part of the original action-research programme in 1998, and the third, a village where women had recently organised themselves into a group, and had begun to adopt and implement similar strategies. The household survey was carried out in January 2008. The primary objective was to understand the changes in relation to the three key areas of intervention namely (i) changes in cropping practice and shift from monocrops to mixed cropping which would generate crop by-products for poultry feed, (ii) adoption of preventive and first aid practices based on indigenous and modern practices and (iii) the spread and reach of the traditional asset-building *vaata* system, and assess its impact on the local poultry genetic resources. Finally we were interested to understand its overall impact on food sovereignty and people's livelihoods, as perceived by women. Hence a combination of qualitative and quantitative methods was used.

Results

Women shared that the Aseel poultry populations in the village as also across households had remained constant and in some instances increased. Village level studies were consistent with these observations, where of a total number of 87 households, 93 per cent owned Aseel backyard poultry (Table 1). There appears to be a

slight increase in the average per-capita poultry holding which was found to be 11.23 birds in 2008 as compared to five to 10 in 1998. (Girijana Deepika et.al. 2002)

Table 1 Poultry Population – January 2008

Name of village	Total house holds	Households owning poultry	Poultry population	Average birds per household
Chaparatilalam	23	22	239	10.86
Kanthalabanda	49	46	535	11.63
E. Ramavaram	15	13	136	10.46
Total	87	81	910	11.23

At a macro level, the most recent agriculture survey was carried out by *Tholakari* in April 2007 in 68 villages to estimate the crops cultivated in the agriculture season June 2006 to March 2007. The survey revealed that 1032 farmers had cultivated food crops in 3096 acres, which was 60 per cent of the total available cultivable land. Over 20 different food crops comprising cereals (finger millet, italian millet, little millet, pearl millet, sorghum, fox-tail millet, kodo millet, corn and dryland rice), pulses (green gram, red gram, black gram, horse gram and bengal gram), oilseeds (sesame and niger) and legumes were cultivated. In 1998 the average coverage of food crops was less than 25 per cent (Muralidharan T and Raghuram, 2003). This indicated that not only had the coverage of land under food crops increased, but also the spread across villages. These food crops provide the primary nutrition base and diet for the backyard poultry. The backyard poultry are fed broken or waste grains and bran of pearl millet and other cereal mixed with the wastage after processing pulses and oil seeds, and as long as these are available from the produce of the household, feed costs are



negligible. Women reported that whereas earlier they had to purchase feed from the market for eight to 10 months in a year, today they were able to feed their birds from their own produce, for at close to 11 months in a year. In certain years when they had experienced a loss of crop (for example in 2005 many farmers lost their entire crop due to severe floods) (Anthra, 2005), women were forced to purchase feed from the market. Women reported that cultivating food crops had helped them reduce the costs of feed for the poultry, as these were available from their own farms in the form of by-products. Of the farmers who owned poultry, all without exception fed their birds with by-products obtained from the crops they cultivate. The main feed included broken rice, rice bran, bran of other millets, pearl millet by-products, finger millet, etc. It is interesting to note that nearly 60 per cent of the women feed a combination of different by-products of millets which is the dominant dryland crop cultivated in the region, and the remaining 40 per cent feed rice by-products (Table 2).

Table 2 Poultry Feed Source and Type of Feed

Name of village	Number of farmers feeding by-products of own crops	Type of feed broken rice / rice bran	broken millet/ bran
Chaparatiipalam	22	10	12
Kanthalabanda	46	16	30
E. Ramavaram	13	7	6
Total	81 (100%)	33 (40.7%)	48 (59.2%)

In 2007, women were able to mobilise Newcastle (NCD) preventive vaccinations from the government animal husbandry department, and 12,000 birds across 45 villages were vaccinated in January 2007. Women shared that they had been consistently getting their birds



immunized against NCD since the past seven years, through mobilising vaccinations from the government, which was available free of cost. The actual vaccinations were administered by women and men from the villages, who had earlier been trained to vaccinate birds by collaborating organisations. The greatest challenge was obtaining sufficient quantities of vaccines at the correct time, prior to the usual season of outbreak. Preventive vaccinations against fowl pox were even more difficult to obtain. Focused group discussions with women revealed that while there had not been a major NCD outbreak in any of the villages over the past six years, in 2008 they had received reports of NCD outbreaks from some villages. They attributed this to the fact that the government had no NCD vaccinations available in the month of December 2007, when the women had approached them for vaccines. Birds had been vaccinated in January 2007, and by January 2008, when NCD outbreaks were reported from some villages, it was well beyond the immunity period provided by the previous year's vaccinations. Village-level studies confirmed this observation. In one of the villages which reported a crude mortality rate of 29 per cent, (Table 3), 68 per cent mortality was attributed to NCD which had occurred in January. There were no reports from the other two villages.



Table 3 Morbidity and Proportionate Morbidity Rates of Disease Conditions

Morbidity	Occurrence of disease in the three villages between January 2007 and January 2008 (Percentage)			
	Chapratipalam – Average poultry population –320 Crude morbidity – 35%	Kanthalbanda – Average poultry population –750 Crude morbidity – 38%	E. Ramavaram – Average poultry population – 176 Crude morbidity – 51%	Total – Average poultry population – 1246 Crude morbidity – 39%
Bacterial white diarrhea	22	4.2	58.8	18
Ranikhet	Nil	62.8		36.6
Fowl pox	55.2	29.4	5.5	31
Others (cold, cough, etc.)		3.6	18.8	8.3
Predators	22.8	Nil	16.9	6.1
Total	100	100	100	100

The village mortality and morbidity studies revealed an average crude morbidity rate of 39 per cent and mortality rate of 25 per cent. This however masks the variation between villages (see Tables 3 and 4). Once again it is evident that NCD and Fowl pox (FP) continue to be the major cause of both morbidity (NCD–36 per cent–; FP–31 per cent–) and mortality (NCD–47 per cent; FP–32 per cent). While this continues to be lower than the original base-line study of 1996 which reported an overall crude mortality rate of 70 per cent, it is significantly higher than the crude mortality rate of six per cent reported in the year 2002.



Table 4 Mortality and Proportionate Mortality Rates of Disease Conditions

Mortality	Occurrence of death in the three villages between January 2007 and January 2008 (Percentage)			
	Chapratipalam – Average poultry population –320 Crude morbidity – 17.5%	Kanthalbanda – Average poultry population –750 Crude morbidity –28.9 %	E. Ramavaram – Average poultry population – 176 Crude morbidity – 21.5%	Total – Average poultry population – 1246 Crude morbidity – 24.9%
Bacterial white diarrhea	3.6		39.4	5.4
Ranikhet	nil	67.7	Nil	32.1
Fowl pox	50	31.7	7.8	47.2
Others (cold, cough, etc.)	Nil		7.8	2.2
Predators	46.4		39.4	13.1
Total	100	100	100	100

Women reported that many of them were preparing and using traditional herbal remedies, which they had learnt through training and extension programmes carried out in the village by Tholakari trainers and animal health workers. Most widely adopted practices included

- i) Feeding birds with garlic (*Allium sativum*) pods in winter months and *Allium cepa* during the summer
- ii) Adding turmeric (*Curcuma longa*) or potassium permanganate in drinking water every day

- i) Feeding birds every week with alternating herbal medicines such as leaves of *Andrographis paniculata*, *Pergularia daemia*, Curry leaves and *Momordica charantia* leaves.
- ii) Treating bacterial white diarrhea with powdered bark of *Ailanthus excelsa*.

Despite the continued loss due to NCD and Fowl pox, what the study brought out vividly was that women are ensuring that many more birds are consumed at home from their own production, than sold (Table 5).



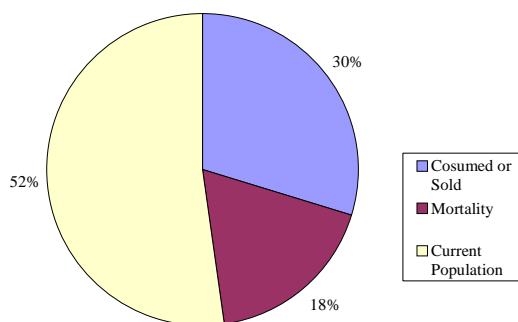
Table 5 Pattern of Consumption and Sales of Backyard Poultry 2007–08

Name of village	House-holds owning poultry	Annual consumption of birds	Annual sale of birds	Average annual consumption per household	Average annual sales per household	Average age of bird at sale (months)	Average sale price (Rs)
Chapratipalam	22	137	3	6.2	0.13	12	300
Kanthalabanda	46	286	13	6.2	0.28	12.4	407
E. Ramavaram	13	66	12	5.07	0.92	7.5	165
Total			28	6.03		10.63	290.66

Another significant change that emerged through the village level studies was that women are now selling their birds at an older age. The average age of bird at sales was 10.1 months as compared to three to four months earlier (Girijana Deepika et al., 2002). Women stated that a major reason for being able to sell birds at a later age, which fetched a higher price (Table 5), was due to increased availability of feed at the household level.

The other interesting factor is that the proportion of birds consumed or sold, is two and a half times greater than birds that died (Figure 1).

Poultry Population Dynamics (Jan 07-Jan 08)



Experience of Asset Building

To understand the experience of *vaata*, the traditional system of rebuilding poultry birds, a detailed case study of one of the original 20 villages where the system had been initiated in 1999, was conducted. *Vaata* is based on a system where the recipient of a bird is obliged to return half of the mother hens' offsprings, to the original donor, for the full life-span of the original mother bird. The women's gotti (group) Tholakari, modified this in that the recipient was required to return half the offsprings only once after receiving the bird. In 1999, 10 women from



village Noogamamidi, who did not own poultry, were each given two Aseel hens and two Aseel cocks. In 2000, they collectively returned 25 chicks aged five months, to the village women's gotti. These birds were re-distributed to other women in Noogamamidi village, who did not possess poultry. In 2001, beneficiaries returned 55 chicks to the village group. As there were no further takers in the village in that year, the women's group decided to sell the birds for which they received Rs 2899 (\$57). This amount was deposited in the women's gotti village bank account. Women members are able to borrow money from the account, in times of emergencies. In 2002 the women's group received 15 birds from beneficiaries, and these were passed on to 15 new women who required birds in the same village. In 2003, women returned eight hens which were passed on to eight women in a new village Chaparathipalem. In 2004 the women from Chaparathipalem returned three birds, and these were distributed to three new women in the same village. In 2005, 10 new recipients,

five from village E. Ramavaram and five from village Ravulapadu received birds from Chaparathipalem. In 2006, three women, one from village Endapally and two from village Peddaddapally received four hens from village E. Ramavaram. It is interesting to note that over the past eight years, the offsprings of the original germplasm spread to 63 women, in six villages.



Case Study 1

Name: Koduthuri Buchamma

Village: Nugumamidi

Mandal: Gangavaram

Koduthuri Buchamma does not own any land or any type of livestock. The family survives for most of the months on the income from poultry. The family members also earn their living through agriculture labour and collection of Minor Forest Produce.

She started her poultry enterprise with three hens and one cock. All the three hens lay three clutches in a year, and in each clutch they lay approximately 15 eggs. Out of the 15 eggs she gets approximately 12 chicks, and finally 10 survive, of each clutch.

So from each hen she gets 30 birds and about 90 birds from three hens in one year. Out of these the family consumes roughly 25 birds in a year, and uses another five for festivals. The remaining birds are sold to others or exchanged for grain. At any given time in the year she has approximately 30–40 birds. From the total birds born in 2008, as of September 2008 she had exchanged 20 birds for grains and had sold another 15 birds for cash. A five-month old bird is exchanged for five kunchams (20 kg) of grain such as gante (bajra), budama (dryland rice) and chollu (ragi). An eight-month old bird is exchanged for 40 kg (10 kunchams) of grain. A one-

year old bird is exchanged for 96 kg (24 kunchams) of grain. A one-year old bird is sold for Rs 200.

Feeding

Annually the birds consume about 40 kg of gantelu (bajra), 50 kg of budama (dryland rice), 50 kg of chollu (ragi) and 50 kg of paddy or bajra bran. She also feeds the left-over cooked rice every day. She obtains the bran from the grains received in exchange from others.

She is extremely happy with the birds and she uses all the herbal medicines learnt through meetings in the gotti, if her birds fall sick. She regularly ensures that the birds are vaccinated against Ranikhet.



Case Study 2

Name: Koduthuru Chinnayya

Village: Nugumamidi

Mandal: Gangavaram Mandal

This family does not own any land or any livestock. Poultry rearing is a major source of livelihood. The family owns four hens and four cocks. Each hen gives three clutches of 15 eggs each. With all the spoilage of eggs and mortality of chicks, from each hen they get 10 birds per clutch, for three clutches or approximately 30 birds from each hen. At any time of the year she has about 40 birds of various ages in her flock. In a year, 30 birds are consumed by the family on various occasions and festivals. Twenty birds are sold for cash and 30 birds are exchanged for grain. The approximate value/rate at which she sells and exchanges the birds for grain are as follows:

Income from sales:

Less than 6-month old bird	– Rs 40
More than 6-month old	– Rs 80
Cock	– Rs 500
Cock (during Sankranti)	– Rs 800–1000

Exchange for grain:

Less than 6-month old bird	– 20 kg (gante, chollu or budama)
More than 6-month old bird	– 40 kg
Cock	– 96 kg

Feeding (Annual quantity):

200 kg	Budama
50 kg	Gante
50 kg	Bran
Left over rice and vegetables	



She obtains the feed from the exchange of birds for grain, or purchases the grain when necessary. She treats the birds with various herbal remedies, and ensures that the birds are regularly vaccinated and dewormed. She is extremely happy with her birds, and would not exchange them for other breeds!

Case Study 3 – The Failed Giriraja – The Put-Together Crossbred Bird

Name: Sagina Bodamma

Village: Nugumamidi

Mandal: Gangavaram

Sagina Bodamma received three Giriraja hens and one cock from the IKP programme (*Indira Kranthi Pathakam*, World Bank funded poverty alleviation programme), a year ago in 2007. They also gave her about 10 kg of jowar flour to feed the birds, as a one time feed. She was also feeding paddy bran to the birds at home. These birds were not able to forage outside as much as local birds, and she had to handfeed them. They were also not eating the local grain, once the initial feed was consumed. She took the birds because the IKP volunteers assured her of huge profits and returns with no expenses.

The first hen gave 10 eggs and 6 chicks hatched. The second hen gave 11 eggs and nine chicks hatched. The third hen died due to a snake bite. None of the chicks survived and the remaining two hens also died due to Salmonellosis.

Sagina Bodamma has not earned anything from the hens and additionally she had to spend a lot of money to purchase feed to feed them. She also observed that these birds have very minimal disease resistance, are very lethargic and are unable to fly and escape predators, the way the local birds do. She feels that these birds are completely of no use to their area, and she refuses to repay the loan.



Discussion

The study has clearly revealed that even after ten years, the basic strategy to strengthen the backyard poultry livelihoods of indigenous women in East Godavari district in Andhra Pradesh, has proven to be valid, effective and has been sustained by local women, even after withdrawal of outside organisations. The strategy has shown to have had an extremely positive impact on stabilising the Aseel poultry population in the area, regenerating the biodiversity of the region and enhancing household food sovereignty and income. The latter is clearly visible by the increased consumption of birds at home as also the ability of women to market their birds at a later age, which fetches them a higher price. Critical to all this has been the huge success of women in rebuilding their diverse food-farming production system. This provides nutrition for the family as also by-products of food crops as a key source of feed for birds, thereby ensuring there is no competition between food grain for humans and the backyard poultry. Herbal remedies that were shown to be effective in building immunity and treating certain conditions, are now widely used and adopted by women who in turn share this knowledge with others both within and between villages. The overall experience of the *vaata* system is varied. While it continues to work in about 10 of the original villages and many new villages, it has stopped functioning through the women's group in others. The reasons for it not working in certain villages are primarily related to the absence of interest and leadership taken by women's group in ensuring that the system works.

Finally, the most crucial challenge to the indigenous women continues to be accessing timely vaccinations to immunize their birds against endemic diseases such as Newcastle disease and Fowl pox, the two diseases that continue to kill birds. The main problem associated with accessing vaccinations is their insufficient production and availability with the local government veterinary

departments, who are responsible for providing public and preventive health services to the local communities. Another grave concern of indigenous women in recent years has been the possible disastrous consequences of a bird-flu epidemic were it to occur, and the fear that the administration would unfairly target backyard poultry and destroy the very birds that are the soul of this culture and people, and which women have so lovingly nurtured and rebuilt and sustain for future generations.

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Livestock, Land use and Environment



Securing Grazing Rights In Forests: Women Lead the Way in Chittoor

Organization - Anthra

Location - Chittoor district, Andhra Pradesh

Year of Intervention - 2004 onwards

Communities – Shepherds (dalits, traditional shepherds and adivasis)



Historically in India grazing on common lands, forests, and harvested agriculture fields has been an integral component through which domestic livestock (large and small ruminants) have obtained their nutritional requirements. Restrictions on traditional community use of natural resources in India has been conclusively traced back by historians to the imposition of state control over forests and other natural resources during the second half of the 19th century, when the British colonial state began to extend its laws and models of private property and state monopoly over natural resources throughout India. This drastically transformed the complex, mutually sustaining relationship that had evolved hitherto between agriculture, forests and pastoral areas. Forest laws and policies in independent India continued to be closely modeled on colonial laws, and placed heavy restrictions on livestock grazing in forests through various Acts that prevented or restricted livestock from entering forests. For those citizens of India who have depended on forests for the survival of their livestock, the past 60 years of independence, has effectively been one lived in terror and fear of doing something 'illegal', in the eyes of the law.

In Andhra Pradesh grazing fees in the form of grazing permits issued to graziers had been in place since over the past century or so. This was withdrawn by the State Forest Department in 1967, when the government directed the Forest Department to allow free grazing of all livestock (save goats) in the reserved forests, in view of the recurrence of drought in many parts of the state and in view of inconvenience caused to the farmers. Forest guards however, continued to harass graziers, particularly goat owners, whose animals grazed in forests. The pressure on graziers, received renewed impetus with the coming of the Joint Forest Management policy and strategy which was initiated in Andhra Pradesh in the mid-1990s. This time round, it was fellow villagers in the avatar of

newly formed village 'forest protection committees' or *Vana Samrakshana Samitis* (VSS), who led the attack on graziers particularly goat rearers. They became the grassroots' arm of the forest department and policed the forest, imposed several fines and fees on graziers, particularly on goats, grazing in the forests.

Forest guards and rangers have harassed and intimidated women shepherds of Chittoor, who graze their animals in forests, since as long as they can remember. They have been stopped and threatened by the guards, fined for grazing their goats, sheep or cattle in forests, and coerced to hand over live animals as payment to the guards. In 1995, the threats received fresh ammunition in

the form of the newly created VSS, under the aegis of the forest department's Joint Forest Management programme. The latter imposed strict fines on shepherds who grazed their animals particularly goats in the forests, that ranged from Rs 10–25 per animal. The ten-year period from 1995 to 2004 (when the sanghams were initiated), was living hell for the shepherds, where the Forest Department through co-villagers sitting as VSS committee members, enforced an unofficial ban on grazing of goats through fines, threats, and terror. Around this period, the State Animal Husbandry Department adopted an utterly illogical and unethical 'unwritten' code that they would neither treat, nor extend their de-worming and vaccination services to cover goats. Severe economic and mental duress caused by the forest department and VSS committee members who belonged to the powerful castes in the local village hierarchy, coupled with the lack of veterinary services for goats, forced several families to sell their goats. While some households completely moved out of small ruminant rearing, others purchased sheep. Maximum offences by forest guards, rangers or VSS appointed guards were committed against women who were primarily responsible for grazing the animals in the forests. The guards captured goats, snatched the women's lopping tools, or fined them, if they were caught grazing goats in the forests. Many women resisted, by refusing to pay the fines, but many could not sustain the pressure, and paid the fines.

Anthra got actively involved in organizing communities who were under tremendous pressure to stop grazing their animals in forests, and helped them collectively to strategise against this repression. We present here the struggle of shepherds in KVB Puram Mandal of Srikalahasti division in Chittoor district. They were mobilized and organised into sanghams, by animal health workers who live in these villages and who were trained by Anthra.

Shepherds in 13 villages, belonging to diverse communities (dalits, traditional shepherd castes and adivasis) were mobilized into sanghams, which have been active since 2004. Through these sanghams, the shepherds resolved to act collectively on common concerns and problems they faced particularly with their animals, such as lack of health care facilities, restrictions on grazing, improving their agriculture practices, etc. All

the shepherds are small and marginal farmers owning small flocks of sheep and goats that range from 20 to 50 animals. The majority of the sangham members are dalits and backward castes, and unlike most other regions, here it is women who are primarily responsible for grazing the animals every day.

Mobilising Against the Restrictions on Grazing

In 2004 when animal health activists associated with Anthra began to mobilise the sheep and goat owning families into sanghas, the grazing problem was the key issue of discussion and debate within the sanghams. Activists informed the community that the government had no written ban on goats grazing in forests. The sanghams gained confidence that they were in the right, and decided not to be browbeaten into submission. They passed resolutions asserting that they would continue to graze their animals in forests, and would resist the pressure of the VSS and the Forest guards. At the same time the sanghams began to actively engage with the animal husbandry department and demanded that they provide services to goats. After initial resistance, the department gradually relented, however surprisingly many of the local veterinary doctors continued to record 'goats' as 'sheep' in their books, fearing their 'higher officials' would penalize them. These local level mobilizations coincided with the larger state and national level mobilizations of several indigenous and other forest dependent/dwelling communities against evictions from forests, and for





The communities from Chittoor participated in several state level mobilizations, as part of larger mobilizations across the country to bring pressure on the Government to enact the Forest Rights Act (FRA), which finally got enacted in December 2006. A historical victory was that the Act for the first time legally acknowledged the right to graze as one of the ten collective rights of the communities. Another critical right in the Act is the right of communities to protect and conserve the forests, which provides the space and pre-eminent role of the community to develop the forest according to their livelihood needs. This right ensures that forests need not be shaped according to 'working plans' of the forest department, which inevitably are in complete opposition to livelihood needs of communities. The forest departments give importance to commercial timber because of the economic returns, or in recent years to biofuel or carbon sink models, which completely contradict the livelihood needs of people. The Forests Rights Act was officially operationalized with the notification of the rules in January 2008.

Use of Forest Rights Act, 2006 to Defend the Rights to Graze in Forests

Without waiting for the rules to be notified (which happened a full year after the Act was passed by Parliament), Anthra

¹ Yakshi, an organization that works with adivasi communities and people's organizations in Andhra Pradesh, translated the Act soon after its enactment, and printed multiple copies of the same, as also trained several activists across AP in the Act and its contents.

pro-actively distributed Telugu copies of the FRA, 2006¹, to the communities through the shepherds sanghams. The community activists took responsibility to thoroughly inform the members of the sangham about the provisions of grazing animals in forests, as presented in the Act, as also armed each family with a copy of the Act. They organised meetings with VSS committee members in the surrounding villages and explained the provisions of the Act and how it gave legal rights to graze to the forest-dependent communities and other pastoralists. They explained that if anyone tried to prevent the community from grazing their animals in the forests, they could be prosecuted as per the provisions in the Act.

Women began to carry the copy of the Act with them whenever they entered the forest with their animals, and confidently challenged the forest guards when they accosted them and attempted to fine or threaten them. The activists accompanied the women into the forests, and were with the community when any attempts were made to stop them from grazing their animals. In the words of Krishnamma, 'We women are strong, and are no longer afraid, now that we have this Act with us. We just wave it in front of their faces opening the book to the page which talks about our grazing rights, and they are too stunned to oppose us.' Since the past two years, the shepherds, especially the women are pro-actively entering the forests, and staking claims to their rights. All the shepherd sanghams have passed resolutions that they will stop paying fines to the forest department employees to graze their goats.



The story of Naguramma and Krishnamma

In 2007 a woman shepherd named Naguramma from Bangaramma Kandriga village was grazing her goats in the forest and the forest guards demanded a fine. She refused to pay the fine, and then the guard prevented her from moving ahead with her goats, holding some of them captive. He tried to snatch the lopping sickle from her hand. She resisted and challenged the guard. The guard got scared and went to the village and called for a Panchayat meeting. In the Panchayat meeting all the shepherds of the village supported Naguramma. They said that they have been grazing their goats in the forests since many generations. Now that their grazing rights are secured and given legal recognition through the Forest Rights Act, 2006 they presented their case and plea to the Panchayat members saying that the forest department has no right to harass them any longer. The Panchayat too agreed, and the forest guard had to retreat. No longer are they being harassed by the guards.

Shepherds in other villages, where there were no sanghams, were still facing threats from the forest guards and continued to be intimidated and fined by them. They approached the local sangham activists, and asked for assistance. Krishnamma, one of the activists, explained the provisions of the Act to the other women, and gave them copies of the Act. She accompanied the women of that village when they took their sheep and goat into the forest to graze holding a copy of the Act. She did this for an entire week and since then the forest guards have stopped harassing and bullying the women grazers.



Present situation

Today shepherds living in villages across KVB Puram mandal have stopped paying fines, and are actively asserting their traditional/customary rights to graze, as the first step towards staking their historical claims to their forests. They also state that they now have the right to graze and protect the forests from the forest guards who sold out truckloads of trees to smugglers in collusion with the VSS committee members.

An interesting development is that many shepherds who had sold their goats previously because of enforcements from VSS have once again purchased goats, as these are far more suitable and adapted to the terrain than sheep, and had always been their source of livelihood, till it was disrupted by the VSS. The goat population had declined by as much as 50 per cent between 1995 and 2003. However, in the past two years, the goat population has increased by 40 per cent.

The rules formulated for the Forest Rights Act says that Forest Rights Committees (FRCs) have to be formed at the panchayat level, so as to be able to receive and process individual and community claims of rights. However the administration has not taken steps to create these committees, and thus the shepherds are yet to formally register their collective rights to graze in the forests, through the FRC. Informally, however, they have staked their rights in front of their respective panchayats.

Local community activists, with the active support of Anthra and other organizations² who are in the forefront of ensuring that the FRA is implemented justly across Andhra Pradesh, are mobilizing the shepherd sanghams, to submit their community claims of grazing rights, to the Sub-Divisional Committee at the district level. Sangham activists have also begun to look ahead and think of how to use their next right, which is, to conserve and develop the forests according to communities' livelihood needs, including developing the grazing resources within the forests.

² Adivasi Aikya Vedika a coalition of Adivasi peoples organizations and struggle groups is in the forefront in this respect assisting communities across AP.

Saying No to Bio diesel¹ / Agrofuel Plantations

Organization - Neelagiri network
Location - Nalgonda district, Andhra Pradesh
Year of Intervention - 2006 onwards
Communities - Farmers and Livestock rearers(women and men)



Neelagiri network is a network of 11 NGOs in Nalgonda district of Andhra Pradesh. Most of the partner organizations are involved in programmes like watersheds, non-pesticide management, veterinary health programmes, health programmes and children and disabled welfare programmes. The network is active in four divisional areas of Nalgonda district.

Partner NGOs of Neelagiri network participated in a year-long indepth training on livestock development in dryland agriculture, organised by Anthra from January to December 2006 . A component of the training involved each group evolving a detailed action plan for livestock development in one village where they worked. This included several rounds of interaction and discussions with farmers and pastoralists communities of the select village to identify problems in livestock rearing and plan possible interventions. Some of the major problems identified were the rapid decline of indigenous livestock resources and breeds, lack of fodder and water for animals, and change in agricultural practice from food crops to cash crops, which had reduced the quality and quantity of locally available crop-residues as dry fodder. Based on this information, the organisations designed detailed action plans to solve the problems. During these

discussions it emerged that biodiesel plantations were being promoted by government on common lands, and private fallow lands. Prior to the government biodiesel programme, these lands were being used to cultivate food crops as also to graze animals post harvest or when the lands were left fallow. This became a hotly discussed and debated aspect of the training, where several resource persons were also invited to share their views and analyse the pros and cons of this new initiative supposed to be a miracle answer to declining global oil reserves.

Nalgonda district is a semi-arid and drought-prone region of Telengana in Andhra Pradesh where agriculture is completely rain fed. Erratic monsoons, coupled with other reasons like increased capital costs of investing in agriculture and lack of livestock, have forced several farmers to leave their lands fallow. These lands are then

¹ Arguments have been raised internationally against the use of 'biofuel', as these crops are neither ecologically sustainable nor environmentally friendly. These crops in fact, displace livelihoods, occupying land that support vital staple foods and poor people's livestock. The term 'agrofuel' is more appropriate as these are agriculture crops being promoted under an industrial farming production system to yield a 'fuel'.

classified as 'private wastelands' by the government. Today under the Indian Government's new Biodiesel policy, these lands are being considered as potential areas for cultivating biodiesel crops. Farmers in Nalgonda used to lease out these 'fallows' or so-called 'waste' lands to pastoralists for grazing under lease arrangements or alternately grazed their own animals. Today they are being motivated by the government to plant *jatropha* and *pongamia* species, the crops of choice as biodiesel crops, on this land and common lands. Livestock rearing communities are directly affected by a programme which is eating into grazing resources, in a situation where there is already a huge scarcity of grazing lands.

The National Biodiesel Mission

The National Biodiesel Mission in India was launched in 2003 where demonstration projects of biodiesel plantations were implemented in two phases across the country in select states, with phase one extending from 2003 to 2007. In Andhra Pradesh, a special Rain Shadow Development Department was created in 2007 under the aegis of the Rural Development Department, to focus exclusively on problems afflicting chronically rain-deficient areas of the state. One of the main functions entrusted to this new department was *promoting and supervising the use of biofuels*.²

In Nalgonda district, as part of the first phase of the national programme between 2005 and 2007, the government, through the District Water Management Agency and District Rural Development Agency, targeted 100 villages across 22 Mandals covering 10,000 beneficiaries with an average 400 acres per mandal. In 2005–06, in Bhongir division of Nalgonda district, 3,36,500 *jatropha* plants were distributed to 127 beneficiaries in 31 villages across eight Mandals and covered 350 acres of land.

A resurvey of those plantations in September 2008 indicated that there was a mere 50 per cent survival of these two-year-old plants. Forty per cent of the beneficiaries were provided with drip irrigation. Government officials had promised farmers a return of

² For more details visit <http://rsad.ap.gov.in/>

Rs 10,000 per acre after three years when the plants would achieve half the total potential production. They assured them of 'zero' investment and irrigation. They were told that one plant would yield 25 kg and they would be paid Rs 10 per kg. All this turned out to be false. With a poor 50 per cent survival, the actual weight of the seeds is much lower than projected. The plants have been attacked by diseases and pests. A meagre five kg per plant is being harvested and the payment is Rs 5 per kg for *jatropha* seeds. What is worse is that farmers lost the lands on which they grazed and browsed their livestock.

The programme has been totally target based. All the officials in the hierarchy from district to panchayat were given targets as to the total area each one had to put under biodiesel plantations each year.

In 2006–07, for instance, the local administration under the biodiesel programme convinced 88 farmers in five panchayats of the Gundala mandal³ to go for plantations of *jatropha Curcas* on their private agricultural lands. All the plantations in the 153 acres by the farmers in Gundala turned out to be failure. Since it was hard for the plants to survive in many areas, the farmers uprooted them. Not to be deterred, the government then decided to distribute saplings of *Pongamia pinnata* (*karanj*), another biodiesel plant, to the same set of farmers. This time, however, it was done through Pradhan Biofuels Limited, a private company set up in Nalgonda district in 2007, situated at Narayanpur mandal. The company appointed agents in 36 mandals of the district who have been entrusted with the task of convincing farmers to grow biodiesel crops.

The farmers were promised that by the end of the fourth year they would get a yield of one tonne and by the end of the eighth year it will increase to five tonnes. Based on this promise many farmers agreed to put their lands in which they had earlier cultivated maize, or on which they grazed their animals, under biofuel crops. The farmers did not have any knowledge of the negative impacts of these plants. Between 2001 and 2006 there were very poor rains in Nalgonda and virtually a drought

³ A mandal in Andhra Pradesh is an administrative unit approximately equivalent to a block in other states of India.

like situation prevailed across the district. In this context of despair, the farmers were promised huge returns with no investment. Since they saw no alternative, they agreed to put their lands under jatropha. In 2008 when there were relatively good rains they were unable to cultivate food crops nor graze their animals on these lands where they had planted jatropha.

The testimonies of the following farmers of Bhongir division echo the despair experienced by vast number of farmers in the district who innocently agreed to planting bio-fuels.



Name: Sappidi Narayana
Village: Urban Colony Gangasanipalli
Mandal: Bhongir

The farmer owns 11 acres of dryland. He has planted mosambi (sweet lime) and mangoes on four acres of land and cultivated paddy on three acres of land. In November 2005 he agreed to plant jatropha on two acres of land. He dug 600 pits, at a cost of Rs 3000. The government gave the saplings for free and drip irrigation facility was given at 80 per cent subsidy. He invested Rs 15,000 on this. He was promised rice by the government officials, which he never received. As soon as the saplings were distributed, the government officials disappeared and are yet to show their face. No one returned to guide the farmer. Today the plants have barely come up. The farmer has been unable to plant food crops this year, despite good rains, and he has lost his land where the livestock used to graze.

Name: Erra Mallesham
Village: Mallapur
Mandal: Yadgirigutta

Erra Mallesham is the chairman of the village water users' association. He owns five acres of land and one acre of wetland. He planted jatropha on two acres of land. He invested Rs 5000 initially and planted 1000 jatropha plants given to him by the government officials, which have completely dried up. He cannot utilize the land for his crops nor to graze the livestock. Not one official who distributed the plants ever visited the village and he does not know whom he should approach.

Name: Nimmala Narsamma
Village: Mallapur
Mandal: Yadgirigutta

Nimmala Narsamma owns 1.5 acres of land and planted half acre with 500 jatropha plants. She invested Rs 3000. They were given some paddy for doing this. They were told that the plants would survive without any water. However, all the plants died as they all dried up. In 2008 because of good rain, about 20–30 plants have sprouted. Today she regrets her decision of putting her land under jatropha. She is unable to graze her animals, nor is she able to plant food crops here. All she is left with are shriveled, dried crops and no land for growing food or to feed their animals. She blames the government for this and feels she was made the guinea pig, as she was not given full information and was tricked into planting this crop.

Name: Mala Reddy
Village: Parapalli
Mandal: Gundala

Farmer Mala Reddy owns 20 acres of land, of which he has been leaving six acres of land as fallow. This land was used by him to graze his animals. Also each year he would lease the land to a group of shepherds, to graze their sheep and lop trees such as *Acacia*, *Anogeissus latifolia*, etc. This system is known as 'kancha' lease system. In July 2007, the government officials enticed the farmer by telling him about all the incentives and subsidies which he could get if he agreed to put his land under trees. The

farmer was told that without any investment, he would get fantastic returns after five years. He signed up to the programme, under the impression that he would be getting a mixture of horticulture trees on his land. However he discovered later that the only saplings provided were pongamias. The current situation is that this has severely affected the local shepherds who were unable to lease the land in 2007 and thus they had shortage of grazing areas.

Campaign against Biodiesel Plantations

Neelagiri Network reflected upon the implications of this programme, and in mid-2006, decided to campaign in the villages to provide farmers with complete information on biofuel crops and the implications of their plantation. The Network members were convinced that the farmers were being misled and had the right to the complete picture so that they could make an informed choice, and not merely be coerced or persuaded because of subsidies and free supplies. They were concerned that government officials and private companies were only interested in targets and land, and gave empty promises. People had the right to complete information whereas they were only given one side of the story to convince them to plant jatrophas or pongamias.

For instance, one of the network members, an NGO 'SHARP', working in Gundala mandal campaigned about the potential negative impacts of biodiesel plantations and their effects on livestock rearers. The farmers began to realize that neither jatropha nor pongamia plantations yielded fodder. They could also utilize their land in several ways that would give them food, fuel and income.



In October 2006 government officials visited village Gangapur in Gundala mandal to promote pongamia plantations. They told villagers that they had to plant pongamia on common lands under the National Rural Employment Guarantee scheme. The officials told the farmers that they would only be paid if they agreed to the pongamia plantation programme. The villagers had already been involved in several rounds of discussions initiated by the local NGO, SHARP, on the need of fodder development on common lands in the village. As a result of these discussions the villagers had organized a gram sabha and had passed a resolution saying NO to biodiesel plantations and had decided to grow fodder. The resolution of the village gram sabha was later submitted to the district administration and they demanded that biodiesel plantation should not be done in their village. SHARP works in five other villages in the mandal, and in all these villages, the villagers said NO and rejected biodiesel plantations.

Another reason which convinced villagers that they would oppose biofuels was the terrible experience of farmers in Jangaon village in Devaruppala mandal in Warangal district which was only seven km away from Gundala mandal. In that village jatropha was planted in about 10 acres of land nearly six years ago which proved to be utter failure. The farmers had already seen this and were convinced that they would not fall into the same trap and thus they decided to oppose the biodiesel plantations.

Another Network member, Sathatha Haritha Society, which has been implementing watershed programmes in Nalgonda district, persuaded the District Watershed Management Agency not to plant biodiesel plants and instead has undertaken planting horticulture and fodder tree saplings which are of multiple use to the communities. This was done based on the demands from the people of those villages where watershed programmes were implemented.

Another network member, SHEAD, has been working in Kammaguda village in Marrigudem mandal for some years. In December 2007, government officials tried to plant pongamia and jatropha in the common lands. The village women SHGs strongly opposed the plantation as it would not provide fodder for their animals and would reduce

access to grazing lands. They did not allow saplings to be offloaded from the vehicle that came to deliver saplings to the village, and sent them back. They demanded fodder saplings to be delivered instead.

Challenges and Constraints

The Network is committed to promoting ecological and sustainable livestock development and agriculture in their areas with farmers. Already some of the Network members are in the process of grounding new watersheds, where they are determined to plan interventions which will help restore the food farming and livestock agriculture systems and practices, to strengthen the livelihoods and build food security. In this context, developing fodder for livestock is very important. They are concerned as to how they can do this in a situation where government policies and programmes along with private agencies are actively pressurizing farmers or alternately bribing farmers with huge subsidies to plant jatropha and pongamia plants on their fields. Simultaneously there are regrettably no similar programmes or monetary support systems to encourage ecological agriculture, livestock and fodder development which is so urgently required.

Faced with the enticing subsidies and false promises, in a situation of huge agriculture distress, farmers are opting for the programmes, only to regret it bitterly, often when it is already too late. The organizations find it difficult to convince farmers about alternate systems, where there are no support systems or subsidies. Many organizations that rejected biodiesel plantations on watershed lands are being harassed by the district officials.

Livestock wealth and livelihoods are under renewed threat with this latest development policy and programme.



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Gobar Gas: The Forgotten Fuel

Organization - Venu Madhuri Trust

Location - Ramanwadi, Tehsil Radhanagari, District Kolhapur, Maharashtra

Year of Intervention - April 2008 onwards

Communities - Small, marginal farmers and pastoralists



There has been a transformation from sustainable agriculture production systems to centralized, input-heavy systems that are dependent on outside non-renewable resources. Communities have lost faith in their own traditional systems and are caught in a vicious circle. Looking at cattle only from their milk production potential is another distorted perspective of today's agriculture systems and science being promoted.

Villagers of Ramanwadi are victims of the above system. They have lost the rich diversity of paddy, millets and pulses. They have also lost the livestock which was the backbone of their farming and which contributed energy and manure. The food grown in farmers' fields supplied nutrition to the family. Venu Madhuri Trust (VMT) works to revive the scientific agriculture livestock system of Ramanwadi. The gobar gas project is one amongst various interventions that is done by the organization in the area. Ramanwadi village consists of around 65 houses of which around thirty families are closely linked with the trust.

About the Organization

Registered in 2000, VMT aimed to work towards integrated, sustainable rural development which is based on traditional, time-tested wisdom, and aims at local self-sufficiency. The special thrust area of the trust is promotion, preservation, improvement and better utilization of indigenous breeds of cattle, particularly the

ones that are currently endangered. Present work area is a few villages on the Sahyadri mountain ranges (Western Ghats). Amongst the various villages it works in, Ramanwadi village is the focus, to make it a model of local self-sufficiency.

Ramanwadi village is geographically located in Radhanagari tehsil of Kolhapur district in Maharashtra state. It comes under Radhanagari Wild Life Sanctuary (RWS) that is reserved for Bison. VMT has been present in Ramanwadi since 2001. Since then the trust has developed a deep relation with most of the villagers from lower and middle hamlets. Village youths are told about sustainable development. Any development work to be done is selected and planned by the villagers at Ramanwadi since the organization gets excellent participation of villagers in all the projects here. Villagers' participation in projects ranges from 20 per cent to 50 per cent of the total project cost. Several successful projects (small and big) have been implemented till date. Few of the important

ones are two irrigation projects that perennially irrigate around 25 acres of land that was otherwise rain fed. Regular education about the importance of cattle for agrobased economy has resulted in an increase in cows from three in 2002 to 37 in 2008. A total of 18 gobar gas units have been constructed for better utilisation of cattle dung and supply of sustainable and ecofriendly fuel. The community was trained in various ecological practices including vermicomposting.

The problems experienced included unsustainable agricultural practices which were dependent on chemical fertilizers and scarce utilization of dung. Villagers perceived cattle only as a source for milk, and preferred buffaloes. The cattle population was very low with diminishing numbers of local breeds, and absence of veterinary services. The health of villagers was poor. Cooking on *chula* (wood stove) caused women and children to inhale huge quantities of smoke and suffer from respiratory diseases. It also meant that women had to spend long hours (at least two to three hours) each day to collect wood.

Gobar gas plants

Gobar gas plants on individual basis were introduced as a health and eco-friendly device for the better utilisation of dung. Eighteen families were given a gobar gas unit each. Each unit is of two cubic meter, which is sufficient for a family of six to seven. A gobar gas unit requires 50–60 kg of dung daily that can be obtained from three cattle. The gobar gas is a simple and sustainable technology. The dung and urine is utilized for gobar gas production and then recycled for farming. It also is good for the environment, as it reduces the consumption of wood. It helps women, as they do not have to walk long distances for wood. Because of gobar gas fuel the otherwise carcinogenic effect of smoke by burning of wood is eradicated and more time is saved to do extra work or women can take much needed rest. VMT, with the help of the villagers planned the intervention.

The use of cattle dung to generate gobar gas is well known in the Indian subcontinent. The digesters that are used at Ramanwadi are of the Deenbandu model, which



was developed by AFPRO in Delhi in 1984 as an improvement on the Janta model. The body of the digester is a round tank, with a volume of about two cubic meters. This is built from bricks and mortar and sunk in a pit in the ground. Dung slurry enters the tank. The slurry of dung and water ferments in the tank, and the pressure of the gobar gas produced push the slurry out of one end. The gas is piped from the top of the tank to a gobar gas cooking stove or gobar gas lights. The slurry is collected and used as fertilizer.

After the basic work, the gobar gas programme implementation was initiated in April 2008. The construction of all the 18 gobar gas plants were completed in May 2008. The gas production and actual use of plants began in June. A one cubic meter plant is sufficient for a family of three, and requires 25 kg of dung daily that is supplied by one or two cattle. A two cubic meter plant caters to a family of five or six, and requires 50 kg dung every day, that is supplied by three cattle. Daily dung output (which can be collected in the cowshed) of one cow which is stall-fed is about 25 kg; if the cattle are grazed on pastures then the daily dung output is 15–18 kg. The construction cost of a single plant is Rs 11,500.

The cost is shared in following manner:

Title	Amount (Rs)
Family participation	Cash 1100
	Labor 1000
Government Participation	3500
VMT	5900
Total Cost	11,500

In June 2008, on the first day when the biogas plant began to work, one of the beneficiaries, Mr Patil received three hours of gas, and this sufficed to cook the day's meal for the family, consisting of eight people. The plant produced three hours of gas in the evening as well. Gobar gas production is best when the temperature of the dung slurry is 35–40 degree C. Normally in high rainfall area like Ramanwadi the gas production is best during summer, moderate during rainy season and little poor during winter. One can accelerate the temperature of slurry by adding warm water to slurry preparation.

Along with construction of gobar gas digesters, equally important was training on its daily use. So, for all the beneficiaries VMT conducted a training session that explained the do's and don'ts of using the unit. Also a user's manual has been prepared in a very simple format and is given to beneficiaries in the form of laminated chart to be displayed in their homes. To load the digester with dung for the first time, it requires one cu m of dung slurry, that is about one tractor trolley of dung. All the beneficiaries fell short of the capital dung requirement. This made the beneficiaries run to surrounding villages to get dung transported by oxcart, head loads or by jeep, creating demand and giving importance to dung. Presently two villages Ramanwadi and Bhari Bhambar are covered partially under the gobar gas scheme. There are 15 beneficiaries in Ramanwadi and three in Bhari Bhambar.

What Came Before the Gobar Gas!

During the initial period (around 2002) a detailed study of the problems and its root causes was conducted at Ramanwadi. Thereafter VMT worked as follows.

In 2006–07, three persons from VMT joined the Anthra training programme on Livestock and dryland agriculture, where they were exposed to a range of issues concerning

the latter. Through the inputs received, the trainees were able to carry out regular awareness programmes where villagers were made aware of the importance of indigenous cattle for agriculture, human health, energy and environment. They began to document and promote the local fodder and medicinal plant varieties. A small veterinary clinic was set up at village level and one of the trainees was appointed as a full time Live Stock Supervisor. The clinic looks after preventive health, curative treatment of cattle and nurturing the breed through natural breeding mechanisms. The villagers were taught the relations of cow and its products like urine, dung etc. to organic farming which was promoted. Villagers were trained in various aspects of organic farming like vermicompost etc. All the above resulted in increase of cattle population at Ramanwadi. **The study of the lower hamlet at Ramanwadi consisting of eight houses showed three cattle in 2002 and 37 cattle in 2008.** With the increase in cattle population the gobar gas project was planned that added further value to the presence of the cattle. From farmers' point of view the benefits were health for the family and the saving of time for collection of fuel wood from the forest. Also, the cattle dung could be used for biogas and agriculture.

Village Level Institution Which Took the Responsibility

There is a village development committee in Ramanwadi. This committee has been formed to support all developmental work that take place with the help of VMT. Every fortnight members of the committee as well as other families who support the trust, get together for a community gathering followed by a common dinner. The



dinner is followed by a discussion on village development issues. Every development work is decided, discussed and implemented through this committee. VMT has a full-time staff who guides and catalyses the committee. For an irrigation water project, the beneficiaries work together and follow the system of sharing water by turn. Also maintenance and repair issues related to water system is tackled by the group of beneficiaries independently.

VMT has indirect linkages with the local government. The gobar gas contractor was a government licensed contractor. He annually gets a target from local government for construction of gobar gas plants in selective tehsils. The contractor constructed the 18 plants and it was his

Immediate (personal) impact	Reduced drudgery of fuelwood collection for women. On an average, earlier they would walk two to three kilometres daily.
	Reduced indoor air pollution. (average six members per family) *
Agriculture (personal) impact	Good organic fertilizer for fields
Local ecological impact	Saving of approximately 93.6 tonnes of fuelwood every year (because 18 trees are saved from being cut)
Local gene bank impact	Local cattle breed gets preserved and developed as dung gained importance
Universal impact	Carbon Dioxide emission reduction (thus reducing greenhouse gas effect) to the tune of 169.2 tonnes per year, which would have emitted by the 18 families by burning fuelwood

Source: ARTI

Note: * Indoor Air Pollution (IAP) is a major health threat for women and children under five in the developing world. According to WHO, annually 500,000 women and children in rural India die prematurely due to diseases linked to long term exposure to IAP. A major cause of IAP is smoke in the rural kitchen, due to use of firewood and agrowaste as biofuels in traditional cookstoves.

Some of the reasons for success of the Gobar gas technology were (i) the gobar gas intervention was built on the strong foundation that the cattle wealth has been restored; (ii) Gobar gas technology is a proven one and responded well to the needs of the community; (iii) There was involvement of the government and VMT, which gave several training and technical support inputs. VMT is exploring possibilities of generating electricity and running a flour mill and similar other devices with it. That will make livestock more productive.

Demand from Other Villages

The news of the success of gobar gas at Ramanwadi spread to other villages. They too have approached VMT to assist them in constructing gobar gas units. However, the challenge is to build the pre-requisites before such units can be constructed. Critical amongst them is rebuilding the cattle wealth of an area, and re-orienting communities to the multiple uses of cattle such as ox-power in the area of agriculture, transport, cottage

responsibility to get the subsidy amount of Rs 3500 per plant from the zilla parishad.

Gobar Challenges and Its Impact

Though gobar gas is a very simple and beneficial rural technology, people feel it is a failure. The important reason identified for this was negligence to educate villagers about the basics of maintenance. VMT has tried its best to focus on educating the villagers in this aspect. VMT imparts practical training. It also gives a user's manual consisting of the do's and don'ts to every beneficiary hoping that the constructed plants function properly.

industry, etc. and then ensuring that the animals have good access to health care and the owners, knowledge on animal husbandry.

At the community level VMT's special thrust area is promotion, preservation, improvement and better utilization of indigenous breeds of cattle, particularly the ones that are currently endangered. The Food and Agriculture Organisation (FAO) has expressed deep concern about the extinction of traditional, local breeds of animals, especially cattle. The rate of extinction is very dangerous, almost one traditional species a month. VMT draws inspiration from M.K. Gandhi's village development principles where one of his guidelines read:

- keep a careful eye on the cattle wealth of the village. If we cannot use this wealth properly India is doomed to disaster and we also shall perish. For these animals will then, as in the West, become an economic burden to us and we shall have no option before us save killing them. (M.K. Gandhi, *KhadiWhy andHow*, 1959, p. 162)

Livestock Health, Nutrition and Management



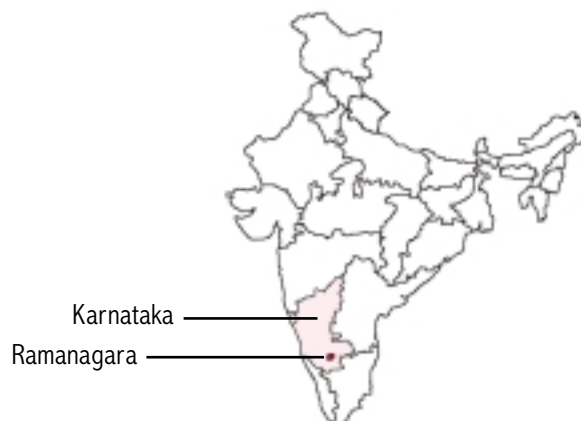
Communities Conserving Indigenous Fodders to Sustain Livestock Farming

Name - Dr G.V. Muralikrishna

Location - Ramanagara District, Karnataka

Year of Intervention - 2005–06 onwards

Communities - small and marginal farmers



Large parts of Karnataka have been severely affected by drought over the past decade. This has resulted in high levels of distress sales of animals due to fodder shortage. Under such conditions small ruminants survive by utilizing natural tree fodder, unlike large ruminants. The Animal Husbandry Department's response to such situations has simply been to distribute fodder seeds which are grown under irrigated conditions. These are all annual grasses. This type of intervention only benefits a few farmers who have irrigation facilities. Poor and marginal farmers without irrigation facilities derive no benefits from these kinds of fodder interventions.

This is the story of Dr G.V. Muralikrishna, a veterinary doctor, who thought differently and attempted to approach the fodder scarcity issue by looking at the problem from the farmer's perspective, working with them to innovate solutions.

Dr Muralikrishna has been working in the Department of Animal Husbandry and Veterinary service, Karnataka for the past fifteen years. Concerned at the problems witnessed around him, he decided to work on the challenge of building fodder security in rural areas of Karnataka. His knowledge and expertise extends beyond the portfolio of a regular vet, and includes issues related to sustainable agriculture and livestock development in dryland areas and indigenous knowledge of natural fodders-trees, shrubs, climbers, herbs and grasses and other unconventional sources of fodder.

Livestock is the backbone of the farming community and our committed veterinarian was deeply concerned about the rapid loss of livestock wealth, as farmers sold them during acute periods of drought and fodder shortage. These animals finally reached the slaughter house. He began to explore alternative ways to help farmers.

Dr Muralikrishna started work in Sugganahalli located 70 km from Bangalore in Kannuru Panchayat of Kudur Hobli, Magadi Taluk, Ramanagara District, Karnataka, in 2000. It is a rain-fed area, where very few farmers own borewells for agriculture and livestock-rearing purposes. The majority depend on rains. Farmers, who have water facility, cultivate coconut, paddy, arecanut and vegetables. Under rain-fed farming conditions they grow ragi, cow pea, jowar and field beans. His work now reaches out to 60 farmers in 12 villages (Sugganahalli, Virupapura, Honnenapura, Kannuru, Hullikal, Banadapalya, Kenkere,

Kinkerepalya, Kuduru, Bisilehalli, Veerasagara and Srigiripura). The farmers comprise gowdas, lingayats, brahmins, gollas and dalit communities.

Problems encountered and addressed

When he began work, Dr Muralikrishna realized that there was no documented information on the local available natural fodders in terms of their seasonality, availability and palatability. The seed material of some species was not available. The community was also not fully convinced about conserving and propagating natural fodders.

He went to the villages and met farmers, where he initiated discussions with them on the problems they faced and the health and breeding aspects of livestock. It was during these intense interactions that farmers talked about the acute fodder shortages and asked if there were way in which they could grow fodder which could be available during the drought and summer periods. The work on fodder began in 2005–06.

Important Steps in the Process

Natural fodders were documented in the 12 villages and a total of 186 natural fodders were recorded, of which 32 were trees, 16 shrubs, 12 legumes and 120 different grasses and herbs. Different crop residues, their availability and seasonality were recorded. Plant herbariums were prepared to ensure proper scientific identification. Farmers' perceptions on different natural fodder was collected, particularly those of women. Participatory exercises were conducted with farmers to assess the palatability of different fodders, across species. Important fodder seeds were collected with the help of farmers and these were prioritized.

In 2005–06, five farmers, already practicing dryland agriculture, were selected from each of the 12 villages and they underwent several trainings on their own farm fields on different propagation methods, storage of crop residues, minimizing fodder wastage, mixed cropping

system and agro silvipasture systems. Utilisation of unconventional fodders was demonstrated. This included information on Azolla and silage techniques. Community fodder tree nursery was developed in the backyards of farmers' houses. Improved fodder storage techniques were taught to the farmers. Saplings and stem cuts were planted on farm bunds, tank bunds, and in the farmer's backyards. Farmers who took saplings planted them in July 2006. Three thousand tree stumps and saplings of Hoovarsi (*Thespesia populnea*), Agase (*Sesbania grandiflora*), Hebbevu (*Melia dubia*), Gobbargide (*Glyricidia maculate*) were planted on farm bunds and waste lands. Grass seeds of Vunaga or Karagada (*Heteropogon contortus*), Neribala (*Pennisetum macrouram*), Porehullu (*Panicum prostratum*) were broadcast in newly formed / old tank and farm bunds. As a live fencing, Sankapuspa (*Clitorea ternatia*), Nasgunni (*Mucuna sp*) and Hurali (*Dolichos biflorus*) were planted. Some of the local legumes that farmers were encouraged to cultivate include sunhemp, groundnut, cowpea, Bellada genasu, Avare balli (*Dolichos phaseolus*), kaddu Deahenja (*Wild Dahenja*) and kaddu Uddu. Local varieties of sorghum and maize seeds were distributed to farmers who have water facility, to grow and to preserve them as silage. Azolla was introduced to ensure protein rich, low cost fodder as an alternative nutritional fodder source. Farmers were taken to the fodder farm in Sugganhalli farm at Magadi taluk, for exposure.

In 2007, Muralikrishna joined the Anthra training and there were more ideas and techniques exchanged and generated around the applications of indigenous fodders. Anthra ethno-botanists assisted in identifying the traditional fodder varieties.



Some of the important species which were documented of which some were propagated include:

Grasses

Sl.No.	Vernacular name	Botanical name	Localities where grown
1	Bodehullu, two varities: (a) Broad bladed (b) narrow bladed	<i>Andropogon sp.</i>	On poor and dry ground, on steep sides or hill tops at high elevations.
2	(a) vunaga or karadaga, (b) Hanchi (c) Sanahanchi	<i>Heteropogon contortus.</i> <i>Aristida coerulescens.</i> <i>Aristida coerulescens var.</i>	Elevated , dry, loamy soils, also on hard, stony grounds and shallow soils overlying beds of gravel and stone. Generally very poor and dry soil
3	(a) kachi (b) Gandukachi	<i>Andropogon schcenanthus Anthisteria ciliata</i>	In level tracts of dry red loams or soils overlying beds of laterite gravel. Soils containing considerable organic matter.
4	Mani	<i>Chrysopogon squamosus.</i>	In low-lying stiff soils and also on elevated land.
5	(a) Ganjalagarike (b) Naribala (c) Hulimise	<i>Andropogon Bladhii. Pennisetum macrourum. Chrysopogon caeruleus.</i>	In all well drained grounds, where the soil is fairly rich.
6	Tungi, two kinds: (a) The bulbous variety (b) Fibrous rooted variety	<i>Cyperus rotundus</i> <i>Cyperus compresus</i>	In low- lying moist sandy soils, especially those under cultivation.
7	(a) Garike (b) Porehullu	<i>Cynodon dactylon.</i> <i>Panicum prostratum.</i>	In rich soils where manure collects. It is also found to grow in all well-drained soils once under cultivation.

Trees

Sl no	Vernacular name	Botanical name	Parts used	consumed
1	Elachi	<i>Zizyphus jujuba</i>	Fruits and leaves	Goats, sheep
2	Hoovarsi	<i>Thespesia populnea</i>	Leaves	Sheep , goats, cow
3	Hunasemara	<i>Tamrindus indica</i>	Leaves , seeds , fruits	Sheep , goat and pig
4	Nerele	<i>Syzygium cummini</i>	Leaves and fruits	Sheep, goats
5	Agase	<i>Sesbania grandiflora</i>	Leaves and pods	All animals
6	Male mara	<i>Samanea saman</i>	Leaves and pods	All animals
7	Kari jali	<i>Prosopis juliflora</i>	Pods and leaves	Sheep and goat
8	Nuggi	<i>Moringa oleifera</i>	Pods and leaves	All animals
9	Hebbevu	<i>Melia dubia</i>	Leaves and pods	All animals
10	Gobbar gidda	<i>Gliricidia maculata</i>	leaves	All animals

Impact and Challenges for the Future

Farmers were able to understand and adopt the method of revival and conservation of natural fodder species to sustain their livestock. Some of the herbs and shrubs which were available in the field have medicinal values. Farmers were taught about the use of these herbs and this proved beneficial in treating the animals. Green fodder ensiling to feed animals during drought and dry season was readily accepted by the farmers and this improved the animals' health. Fodder wastage was minimized through proper handling, storage and improved feeding techniques.

In the beginning farmers did not co-operate with tree plantation on their farm bunds. However, with training on agro forestry and silvipasture systems, farmers got convinced and they volunteered to try these out in their fields. A major challenge was collecting seeds of traditional species, as these are available only in specific seasons.

Proper education of the farmers on the use, revival and storage, nutritive and medicinal value of each and every fodder species available in the area remains a challenge along with convincing the farmers to diversify their cropping practices, which will help in generating crop-residues.

The intervention preceded a period of intense drought and acute fodder crises, which created a context where farmers were eager to discuss and experiment with strategies to solve the fodder problem. It is possible that this approach be replicated in other areas, but it must go hand in hand with efforts to strengthen the larger dry land agriculture being practiced by farmers.



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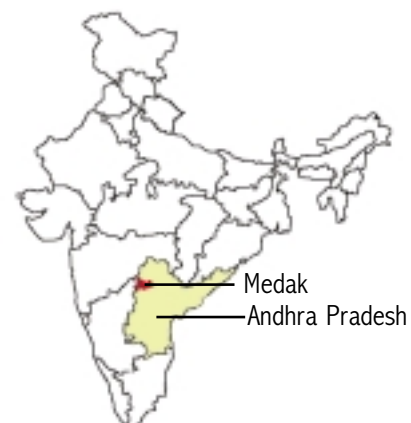
Fodder First in Chennapur !

Organization - Anthra

Year of intervention - 2005 onwards

Location - Chennapur village, Medak district, Andhra Pradesh

Communities - landless, small and marginal farmers, agro-pastoralists, pastoralists



In Medak district, there are several factors responsible for growing fodder and water scarcity. The green revolution technologies have promoted mono cropping largely devoid of food value, as against the diverse and multiple food cropping patterns that existed earlier. The so-called 'weeds', which essentially are diverse legumes and grasses that grow in agriculture fields and have fodder value, have been destroyed due to excessive use of weedicides. The situation has deteriorated with growing grazing restrictions, loss of common property resources (CPRs) and loss of traditional fodder diversity in forests and CPRs. Strategies to enhance fodder charted through national and state plans over the years have historically been geared towards promoting a few irrigated grass varieties, that can only be cultivated on private lands with an irrigation source. This excludes large numbers of farmers, who only own drylands or rainfed lands or are landless. The burden of fodder and water scarcity has always been on women who have to walk longer distances either to graze their livestock, or to collect green grass or water for their animals. Anthra was keen to explore strategies to not merely address the fodder needs of livestock, but do it in ways that responded to women's needs and concerns.

Fodder for Thought

Anthra piloted its work in village Chennapur of Shivampet mandal in Medak district in January 2005. The objectives of the project were to (a) build fodder security for poor women livestock producers through participatory evaluation and management of different agro-silvi-pastoral systems and (b) utilize indigenous fodder and forage varieties for sustainable fodder production from private and community lands. The pilot project was supported by the Department of Science and Technology through a three-year grant that commenced in January 2005.

The village shepherds' sangham as also 42 women farmers who belonged to marginal and small households in the village became actively involved in the effort to build fodder security at their household and larger village level. Of this 21 women belonged to the dalit community and the remaining 21 were backward castes (BC) and other castes (OC). Anthra designed an operational plan to rebuild fodder and water security in the village with the villagers, based on preliminary findings on fodder and water availability in the village.

The Village Prior to the Intervention

Chennapur along with its three satellite Lambada thandas or hamlets, has a total geographical area of 752.75 acres. It does not have any forest land, barren or uncultivable land or pasture land. In 2002, the total agricultural land was 664.15 acres, of which the net sown area was 555.6 acres (84 per cent) and the current fallow land was 108 acres (16 per cent). Land under non-agricultural use was 88 acres. Of the total agriculture land, 15 per cent was and continues to be irrigated and the remaining 75 per cent non-irrigated. The main soils are red and black; bore wells are the major source of irrigation. The average land holding is two to three acres. In 2002, of 118 households, less than two per cent owned cows, 34 per cent (41 households) owned bullocks, 62 per cent (74 households) owned buffaloes, six per cent (seven households) owned goats, 10 per cent (12 households) owned sheep and 43 per cent (51 households) owned backyard poultry. There were two cows, 74 bullocks, 254 buffaloes, 250 goats, 745 sheep and 173 poultry in the village. The marginal and small farmers owned all the livestock, except for two middle class farmers who own 18 buffaloes. The distribution of livestock across caste indicated that less than half of the total SC families (13 households) owned some livestock asset, and about 20–25 per cent of the village livestock was owned by SC households. Some of the lambada families have poultry farms.



First Steps

The intervention began with the community assessing and analyzing fodder and water resources in the village, which revealed the following:

Hybrid maize and paddy were the dominated crops and had replaced traditional millets and pulses. Paddy was cultivated in 20 acres, and maize in 100 acres. Approximately a quarter of the village purchased dry fodder to feed their buffaloes. An acre of paddy yielded 120 bundles¹ or 1200 kg of paddy straw, and an acre of maize yields 4 cartloads/100 bundles or 500 kgs of crop residue. Using these approximate yields, the total annual dry fodder available in the village from paddy was estimated to be 24 tonnes and from maize 40 tonnes. According to farmers, a buffalo consumes one bundle of paddy straw and 2 bundles of maize straw, equivalent to 20 kg per day. There were 300 buffaloes in the village at the time of the survey, whose fodder requirement would be six tonnes of straw per day. The entire straw available in the village would be sufficient for a mere 10 days in a year! No wonder that farmers were purchasing dry fodder. A mere 16 per cent of buffaloes were in-milk, even before summer had set in. Farmers were using environmentally harmful chemical herbicides to control weeds in their maize fields. In the process many valuable fodder varieties were getting destroyed, resulting in a decline in the availability of natural fodders such as *Panicum repens*, *Pisalis minima* and *Digitaria sanguinalis*.



¹ One bundle weighs roughly 10 kg

Of the 50 bore wells in the village, only five were functional. Farmers who owned these functioning bore wells were cultivating paddy and sunflower as second crops and also some vegetables like tomato, green chillies, brinjal and onion. Green fodder was available between July and November each year. Goat rearers expressed an interest to plant Acacia trees on their field bunds. Buffalo farmers expressed an interest to cultivate green grass, but had no idea as to what would grow on their lands, particularly with scarce irrigation. The main drinking water resources were the 'cheruvu' or village pond, other smaller watering holes and bore wells. The 'cheruvu' and smaller watering holes were full of Ipomoea species. The ponds needed to be cleared and de-silted and then they would regain their use as a watering source for livestock. The farmers said that fodder trees and grass species could be planted along the tank bund, which would also strengthen the tank bunds.

The Chennapur villagers, including the Sarpanch were enthusiastic to work at rebuilding fodder and drinking water sources in their village.

The villagers along with the Anthra team chalked out further steps towards achieving this objective.

Fuelling Fodder

Assessing Traditional Fodder Varieties

Between March and June 2005, the grazing and water resources of the village were mapped in further detail. Tests by the agriculture department revealed that the soil was mainly neutral or slightly alkaline. Forty two traditional fodder species were identified in the village, which included 24 trees, five shrubs, four climbers, eight grasses and one herb (Table 1a and 1b). These were cross-checked with Anthra's existing database on fodders.

Table 1a : Traditional Tree Fodder Species Documented in Village Chennapur, Medak District

S. No	Fodder local	Part	Botanical name
1.	Are	Leaves	<i>Bauhinia racemosa</i>
2.	Billa godisa	Leaves	<i>Cleistanhus collinus</i>
3.	Chintha	Leaves	<i>Tamarindus indica</i>
4.	Dirisenam	Leaves	<i>Albizia lebeck</i>
5.	Illintha	Leaves	<i>Diospyrus chloroxylon</i>
6.	Ippa	Leaves, Flower	<i>Madhuca indica</i>
7.	Mamidi	Leaves	<i>Mangifera indica</i>
8.	Marri	Leaves	<i>Ficus benghalensis</i>
9.	Medi	Leaves	<i>Ficus racemosa</i>
10.	Moduga	Leaves	<i>Butea monosperma</i>
11.	Nallarengi	Leaves, Fruit	<i>Albizia amara</i>
12.	Nallathumma	Leaves, Pods	<i>Acacia nilotica</i>
13.	Pedda manu	Leaves	<i>Ailanthus excelsa</i>
14.	Puli velaqa	Leaves	<i>Feronia elephantum</i>
15.	Ravi	Leaves	<i>Ficus religiosa</i>
16.	Regu/Reni	Leaves	<i>Zizyphus jujube</i>
17.	Sandra	Leaves	<i>Acacia chundra</i>
18.	Seemachintha	Leaves, Pods	<i>Pithecellobium dulce</i>
19.	Subabul	Leaves	<i>Leucaena leucocephala</i>
20.	Teak	Leaves	<i>Tectona grandis</i>
21.	Thabisi	Leaves	<i>Holoptelia integrifolia</i>
22.	Thella thumma	Leaves	<i>Acacia leucophloea</i>
23.	Thirumanu	Leaves	<i>Anogeissus latifolia</i>
24.	Vepa	Leaves	<i>Azadirachta indica</i>

Table 1b: Traditional Fodder Species (Shrubs, Climbers and Grasses) Documented in Village Chennapur, Medak District

S.No	Fodder	Type	Part used	Botanical name
1.	Balisi aku	Shrub	Leaves	<i>Canthium parviflorum</i>
2.	Manga	Shrub	Leaves	<i>Randia duemerotum</i>
3.	Pariki	Shrub	Leaves	<i>Zyziphus oenoplia</i>
4.	Puredu	Shrub	Leaves	<i>Phyllanthus reticulata</i>
5.	Danthe	Shrub	Leaves	<i>Gymnosporia montana</i>
6.	Shakapuspi	Climber	Leaves	<i>Clitoria ternatea</i>
7.	Chemma teega	Climber	Leave	<i>Canavalia virosa</i>
8.	Donda teega	Climber	Leaves	<i>Coccinia indica</i>
9.	Dusudu	Climber	Leaves	<i>Cocculus hirsutus</i>
10.	Kodi juttu alam	Herb	Leaves	<i>Celosia argentic</i>
11.	Burruchode gaddi	Grass	Whole plant	<i>Chloris barbata</i>
12.	Erra goyi	Grass	Whole plant	<i>Heteropogon contortus</i>
13.	Garika	Grass	Whole plant	<i>Cynodon dactylon</i>
14.	Jerripothula gaddi	Grass	Whole plant	<i>Panicum repens</i>
15.	Odipili gaddi	Grass	Whole plant	<i>Brachiaria cruciformis</i>
16.	Parka gaddi	Grass	Whole plant	<i>Dichanthium annulatum</i>
17.	Pedda garaka	Grass	Whole plant	<i>Dactylactenium aegyptium</i>
18.	Utla gaddi	Grass	Whole plant	<i>Digitaria sanguinalis</i>



Farmers participated in a process to assess and rank the fodder species, prioritizing those which they felt should be propagated. Farmers used criteria such as palatability, traditional effect and availability to shortlist and prioritize *Albizia lebbek*, *Acacia nilotica*, *Holoptelia integrifolia*, *Zyzyphus jujuba* and *Mangifera oleifera* to be propagated. The community was also interested to grow *Madhuca indica* trees, which used to be important. Technical institutions like the Indian Grass and Fodder Research Institute in Jhansi suggested that we also promote *Hardwickia binata* and *Leucaena leucocephala* trees.

Goat rearers and healers, the community members who were experts on local flora diversity, collected fodder seeds of the prioritized species (*A.lebbek*, *A. nilotica*, *H. binata*, *L. leucocephala*, *H. integrifolia* and *M. oleifera*).

Community Fodder Nurseries to Propagate Prioritized Fodder Species

Community fodder nurseries to propagate the species were established and cared for by different farmers each year. In 2005, 3000 bags of *A. nilotica*, *A. lebbek* and *L. leucocephala* were prepared, of which 1800 saplings germinated and were planted. The first two trees had a germination rate of 50 per cent and the latter 80 per cent. Saplings were planted on the community tank bunds and along the borders of public roads in the village. In 2006, another 3000 fodder tree saplings were raised



which included *A. lebeck* (800), *H. binata* (35), *H. integrifolia* (200), *L. leucocephala* (800), *M. oleifera* (250) and *M. indica* (100). Of this 1685 saplings or 56 per cent germinated and were planted along the tank bunds of Kothakunta, Abbilavani kunta and Cheruvu gattu. Thirty five women planted 780 saplings on their own farm bunds.

In 2007, 4800 bags of *A. lebeck* (1500), *L. leucocephala* (2000), *A. nilotica* (500), *M. oleifera* (500) and *Carica papaya* (300) were planted, of which 60 per cent germinated. In July 2007, 39 farmers planted 1704 tree fodder saplings on their own private lands, and 1500

Table 2 Average of 10 sample trees of the species measured

Name of the tree	Date of plantatio	Age in July 2007 (years)	Place of plantation	Girth size (average) (cm)	Height (average) (m)
<i>Acacia nilotica</i>	July 2005	2	Beerappa temple	2	1.8
<i>Albizia lebeck</i>	July 2005	2	Tank bund	2.2	2.1
<i>Leucaena leucocephala</i>	July 2005	2	Near the cattle shed	11.8	4.3
<i>Albizia lebeck</i>	July 2006	1	Kothakunta tank bund	1.62	0.5
<i>Leucaena leucocephala</i>	July 2006	1	Near the cattle shed	5	2.5



saplings were distributed to farmers in Avancha village. In July 2007 the saplings planted in the previous two years were surveyed to assess their survival. The survival rates were 70% for *L. leucocephala*, 90.4 per cent for *A. lebeck*, 50 per cent for *M. oleifera*, 40 per cent for *A. nilotica* and about 30–40 per cent for the rest.

The growth of trees was randomly assessed by estimating the girth size and height at 5 cm above ground level. Figures in Table 2 represent the average of 10 sample trees of each species measured.

Reseeding Private and Public Lands with Traditional Grass Species

Dichanthium annulatum, locally known as gennela gaddi, is a perennial grass that is found naturally on fields bunds of the village. The grass, relished by cattle and sheep, had declined considerably, and thus efforts were initiated to reseed it. About 8000 grass slips were raised in a separate plot and distributed to farmers who planted these on their farm bunds in July 2006. Farmers are utilizing the fodder for their animals.



P. repens, known as jerripothula gaddi, is found growing wild on rice field bunds. It is very palatable and was validated by Anthra in 2003 for its positive impact on increasing milk production in buffaloes. One kg of seed was collected in 2005 and some farmers who did not have this grass on their bunds planted the seeds on their field bunds in 2006. The seeds were multiplied to be made available to other farmers.

Introducing new fodder grass varieties for farmers with irrigation sources

Some farmers, who had irrigation sources, expressed an interest to allocate a portion of their land from December each year, to cultivate fodder grasses. In 2006, 16 farmers cultivated jowar fodder grass varieties allocating on average 0.10 acre of their land towards this. Four farmers cultivated para grass allocating a similar land area. In 2007, 10 farmers cultivated SSG-59-3 jowar on 0.20 acre each, 20 farmers cultivated oats UP0212, four farmers cultivated lucerne and 10 farmers cultivated cow pea, on about 0.05 acre each.



Diversifying crops increase crop residues

Farmers were trained on different aspects of mixed cropping and ecological agriculture. Practical training and field demonstrations were reinforced by exposure trips where farmers visited different institutions and met farmers with several years of ecological farming experience. They visited the Krishi Vigyan Kendra run by the Deccan Development Society, Medak district, Green Foundation located in Karnataka and the Organic Farmers Association of Tamil Nadu. All these visits motivated farmers to change their practices. The farmers were trained in techniques to build soil fertility (eg. mulching, vermi composting, composting and herbal solutions), seed treatment, methods for repelling pests (herbal pesticides, mixed cropping) and methods of seed selection and storage. Expert ecological practitioners such as Mr Nammalvar of the Organic Farmers Association in Tamil Nadu, trained and guided the villagers.

Establishing fodder seed banks

Women farmers have begun to harvest and store seeds of cultivated green fodder crops like sweet sudan grass (SSG-59), jowar (PC-23), Oats, Lucerne and Cowpea EC 4216, which they re-use on their fields as also sell to or share with others. Wild grass varieties such as *D. annulatum* and *P. repens* have been re-established on the bunds, and are a natural source of plant material for interested farmers.

Life sustaining Water

The Panchayat had dug a bore well located near the land dedicated for the nursery. The land also lay adjacent to the path used by livestock to reach their grazing grounds. The community suggested that if a small water tank and trough were constructed, the water could be used for the nursery and drinking water for the livestock. Community labour along with a small contribution from Anthra ensured that a water storage tank and drinking water trough were constructed. The water is pumped from the panchayat bore well into the tank. Whenever required the trough is filled to water animals and is actively used in the summer months.



Renovation of Kothakunta as a Cattle Water Pond

In 2007 there was a severe drought and animals faced acute scarcity of drinking water. In April 2007 a meeting was organised with all the farmers to discuss the growing water problem, and the farmers proposed renovating the kothakunta watering pond, and use it as a drinking water

source for the village livestock. Men and women from the dalit community of the village participated actively in clearing the pond of *Ipomoea cornea* (Thutikada/ Besaram) that had completely clogged the lake, and desilted the pond. The men and women (two men and 10 women) were paid equal wages (Rs 100 per day) for ten days of work. Various traditional fodder and grass varieties raised in the nursery were planted around the tank-bund.



The local panchayat gotA inspired to complete the works that required to be done on the pond, and they passed a resolution to the effect that the National Rural Employment Guarantee Scheme (NREGS) work in their village would be directed towards complete renovation of the Kothakunta tank particularly to strengthen the bund. The community was involved in bund strengthening and desilting during the summer of 2007, and were paid through the NREGS funds. The saplings that had been planted the previous year, unfortunately were uprooted at the time of tank bund renovation. In August 2008, 300 seeds of three varieties of fodder trees, *Diospyros chloroxylon*, *A. lebbeck* and *A. nilotica*, were resown on the tank bund. A farmer from the village took interest and voluntarily collected the seeds.

The tank regularly fills with water during the rains, and is used as a source of drinking water. Farmers have collectively decided to use this tank exclusively to water their animals, and not for agriculture. The entire village will be benefited by meeting the watering needs of their animals throughout the year.

Emerging Changes

Over 40 farmers are in the process of gradually transforming their agriculture from chemical mono cropping to diverse ecological farming practices. They have diversified their cropping to include red gram and jowar along with maize. This has resulted in increased availability of crop residues.

Pre-project baseline data of 2005 indicated that farmers were exclusively cultivating maize crop, using weedicides extensively and had severe bio-mass shortage. Each subsequent year the data was recollected. It was found that there was a gradual increase in both number of women who had put their land under mixed crops, as also the yield of dry crop residue available in the summer months. There was also a drastic reduction in the application of weedicides. It must be noted here that with the exception of 2007, there were good rains, which definitely benefited the overall availability of vegetation and biomass. All these resulted in enhanced availability of crop residue and natural grasses in summer as summarized in Table 3 below. The crop diversity has increased and there is increased availability of dry fodder which is being effectively utilized by farmers during summer. In addition to maize and paddy straw, farmers now have red gram and cowpea husk. Table 3 gives the situation before and after the intervention. Dalit women are cultivating vegetables organically, which is an unexpected outcome of the intervention.

Table 3: Dry Fodder Biomass Obtained from Cultivated Crops

Name of village	Before intervention 42 members		After intervention 42 members	
	2004–2005	2005–06	2006–2007	2007–2008
Chennapur 42 women	Maize straw – 110 cartloads; Paddy straw – 90 cart loads	Maize straw – 130 cart loads Paddy straw – 104 cart loads	Maize straw – 152 cart loads Paddy straw – 150 cart loads Red gram husk – 600 kg	Maize straw – 275 cart loads Paddy straw – 352 cart loads Red gram husk – 1500 kg Cow pea – 300 kg

Livestock increases and distress sales reduce

In 2007 a resurvey of the livestock population was carried out of the 42 participants who volunteered to be part of the project (Table 4). Each household owned one or the other type of livestock. There was a significant increase in buffaloes and goats in the village. The overall number of families that owned buffaloes increased by three, and the average buffaloes (including calves) per households increased from 2.4 to 3.5. The women stopped selling milch buffaloes in the summer. Dalit women took loans to purchase buffaloes. Three of the participants purchased goats and the average rate of goats increased. The bullock population remained almost static. The reasons cited by the women for increased numbers was their confidence in being able to feed and manage their buffaloes throughout the year. Growing fodder trees inspired three families to purchase goats.

The number of goats in the flocks increased due to improved management practices and regular preventive measures. A dalit farmer Ramulu began to rear 30 goats which he acquired on 'sharing basis' from another shepherd.

Fodder and Water for Sheep and Goats, Large Ruminants

In March 2008, all 30 buffalo farmers began to lop 200 subabul trees, to feed their animals. The trees were planted in 2005–06. Of 6173 fodder trees sown between 2005 and 2007, 2972 (48 per cent) survived. From January 2008 onwards, farmers and shepherds began to lop fodder trees grown on their own lands and feed both large and small ruminants. Mechanisms for utilizing trees on the public lands are being worked out with the community. Twenty five farmers reported an average 750 ml increase in daily milk yield of their buffaloes. Farmers are utilizing traditional grass species like *P. repens* and *D. annulatum* instead of destroying them with herbicides during rainy season. Other conventional fodder varieties like hybrid jowar, lucerne, para grass, and cow pea are being cultivated by farmers who have irrigation facilities. *Fodder seed banks* have been established to sustain the supply of seeds in future.

The water tank and small water trough built in Chennapur in 2006 are being utilized by the community effectively, particularly in the summer months. Dalit community head Bikshapati manages and monitors the water trough. The kothakunta water pond is now a regular source of drinking water for the village livestock.

Table 4 Livestock Owned by Villagers Before and After the Intervention

Species	Number of Households		Total number		Average no. of animals per household		Animals owned by SC households			
	Feb 2005	Feb 2007	Feb 2005	Feb 2007	Before	After	Feb 2005		Feb 2007	
							House-holds	Animals	House-holds	Animals
Buffaloes	27	30	65	107	2.4	3.5	15	42	18	72
Bullocks	20	20	48	48	2.4	2.4	10	28	10	26
Sheep	2	2	150	120	75	60	-	-	-	-
Goat	3	5	35	270	11.6	52	2	32	2	124



Scaling up the intervention

In 2006, a similar intervention was initiated in village Avancha. Then in 2008 shepherds of Peddagottimukkala came forward to develop their community land and asked Anthra to assist them in this venture.

In 2007 Shepherds of Peddagottimukkala (PGM) village in Medak district expressed an interest to develop their community land with traditional fodder trees and grasses when they realized that, lamb growth in PGM village was the lowest amongst several villages, due to non-availability of diverse fodders in PGM.

Forty shepherd households in this village own temple land measuring five acres, of which 15 households continue to own sheep and goats. Prior to planning the intervention on this land, rearers and non-rearers sat together and discussed the advantages and disadvantages of developing the land. In this meeting they arrived at a consensus that the creation of a common water facility on the land would be useful for all the households, and could be used for the regularly celebrated Mallanna and Beerappa festivals. If this happened, the non-rearers did not object to the land being developed with multiple trees – primarily of fodder value. The community passed a resolution to this effect. The community also agreed that they would pay the monthly electricity charges and would contribute 25 per cent of the total cost of developing the land.

The community decided that the land would be developed in a phased manner, as their animals still continued to depend upon this resource for fodder. In 2008



the shepherds agreed that 1.5 acres of land would be developed in the first phase. The different activities undertaken included land leveling, application of farmyard manure, fencing the area to be developed and digging a bore well along with a water tank and trough.

In July 2008 during the peak rainy period, *A.lebbeck* (100), *Azadirachata indica* (100), *A. nilotica* (100) seed and some saplings were planted. There is a large diversity of natural grasses which are growing in the protected area and the predominant ones include *D. annulatum* (Gennela gaddi), *Cynodon dactylon* (Garika), *Cyperus sp* (Thuga), *Leptochloa*, *Sporobolus*, *crispogon* (Puthika gaddi), *Digitaria sanguinalis* (Ulla gaddi), *Eragrostis pilosa* (Tella burka gaddi), *Commelina benghalensis* (Nagarsai alam) and legumes of *Aeschynomene indica* (Jilugu) and *Dolichos sp* (Adavi ulava). In October 2008, seeds of the grasses were harvested and used for further multiplication, and to be distributed to shepherds interested to plant these varieties on their private grazing lands or 'woralu', or on field bunds. The community plans to plant several other species of shrubs next year, and is collecting the seeds in the natural forests during this season.

The community decided that sheep should be prevented from grazing on these lands for the first six months. After six months sheep lambs will be allowed for grazing for an hour. Adult sheep will be allowed in the second year, and in the third year goats will be allowed for browsing. Trees can be lopped only after three to four years.

The initiative has helped farmers to innovate strategies to enhance fodder availability.



Banking on Fodder, Surviving Drought

Organization - Shree Vivekanand Research and Training Institute

Location - Kutch district, Gujarat

Year of Intervention - 1994 onwards

Communities - Different Pastoral groups of Kutch



Shree Vivekanand Research and Training Institute (VRTI), Naliya, established in 1975, was registered in 1980 under Bombay Public Charitable Trust Act, 1950. Under the guidance of Mr Kantisen Shroff fondly known as Kakaji it works in 225 villages of Kutch district of Gujarat with 120 staff members. The Government of Gujarat has honored it by ranking it in the 'A' category. It works to promote sustainable rural development with community participation in the areas of rainwater harvesting, water distribution and management, watershed development, prevention of salinity ingress, developing salinity resistant crops, disaster management, livelihood, health and hygiene, education and capacity building programmes at village level. Various environment-friendly activities like tree plantation, eco club, introducing smokeless chullas, etc. are also being carried out. The idea is to develop sustainable economic activities based on agriculture, animal husbandry and rural art and craft.

Working with livestock in Kutch

A large number of families in Kutch derive a livelihood through livestock based activities. VRTI's work includes building institutions for livestock rearers, making available loans to farmers for purchasing indigenous breeds of animals, organizing health camps, vaccinations, preparing and using herbal medicines to treat animals, documenting local breeds, fodder development which includes organizing cattle feed centers and fodder banks and policy advocacy.

The work by the organization benefits 583 pastoralists in 25 villages. A significant innovation has been the creation

of community fodder banks in villages, which has become vital for animals to survive the drought years.

The natural resource base of Kutch has helped animal husbandry grow as an important source of livelihood in the region. However, this is subject to the vagaries of nature. Drought repeats itself thrice in a cycle of five years. In a normal rainfall year, the region produces sufficient quantity of surplus fodder. There are, however, no storage techniques in practice and the villagers confront shortage of fodder as a major concern during drought years. For the survival of the cattle, the cattle owners either have to migrate with their animals or leave them in *Panjrappoles* (cattle camps).

Community Fodder Bank (CFB)

When a group of farmers or animal owners come together and jointly purchase farm straw or grass in a good monsoon year, store it and then sell it to members in a drought year such that they recover the original money to repeat the process again. This is called a community fodder bank (CFB).

Community fodder banks are a step towards making the village self-reliant in terms of fodder even during the drought season. The fodder bank concept is based on traditional knowledge and practices of the community and is easily adaptable and replicable. In normal monsoon seasons the villagers can store surplus fodder in the fodder bank. This fodder is available to villagers during drought years as per mutually agreed rules and regulations. This will ensure sustainability of the fodder bank. This way the villagers will be able to cope with droughts and feed their animals with quality fodder available at reasonable prices in the village itself.

The idea of the CFB was generated during discussions with the village community regarding old techniques of fodder storage. The viability of the CFB bank is based on the fact that in a good monsoon year the price of fodder is half to one-third the cost of fodder in a drought year. In good years the cost is between Rs 40 to Rs 60 and it rises to Rs 120 to Rs 160 per maund¹ during drought years. Fodder bought and stored in a good year can be sold at 30 per cent higher costs in a drought year to recover the expenditure of transport, stocking and weight loss in a bad year. This cost is still 50 to 60 per cent cheaper than fodder in the market.

Does your region need a fodder bank?

If the points mentioned below are valid for your village then you need a fodder bank.

- Cattle have to migrate during drought periods or be sent to cattle camps.
- There is little or no grazing land in your village.
- There is no practice of community storage of fodder in your village.

¹ 1 maund = 40 kg

This practice prevalent for the over 50 years had stopped for a few years. VRTI, made efforts to revive this practice at the village level.

Why does it make sense to have a fodder bank?

Village Varnu in Rapar Taluka of Kutch has 14 cattle which belong to 57 families. Most of the families practice rainfed agriculture. After the monsoon and crop harvest in November–December, the families store the straw in their homes. If in the next year the monsoon fails, they are able to keep their animals alive by feeding them the stored fodder and the little grass available in the *Gauchar* (grazing lands) until December to February of the drought year. But come January, their leaders start going to the *mamlat* and Taluk Development Officer (TDO) to request them to send subsidized grass and set up open cattle camps, where animals will be fed.

The richer farmers and cattle owners start buying fodder which costs Rs 80 to Rs 120 per mound in the open market. The other families prepare to take their cattle to places where grass is available. The poorest selling their animals at distress rates. March to June are the worst months for animals and this is when a community fodder bank can sustain their animals.

How will the CFB be managed?

The CFB is not managed by the government or an NGO but by the members of the CFB themselves. For this a committee is formed. The panchayat is in charge of this and does it in the following manner:

- Call a gramsabha and explain the concept of CFB after which the gramsabha resolves to establish a CFB.
- Elect or appoint a CFB committee of 8–12 people, from members of CFB, atleast 50 per cent of them women, and one member from the panchayat.
- Call another gramsabha in which CFB will present the membership rules where villagers register their names and number of cattle they own.
- CFB committee meets to prepare the budget and put up the proposal before the panchayat for sanction.

- On approval of the proposal, the committee will open a CFB account where a Panchayat member and 1 CFB committee member will be signatories. One of the signatories must be a woman.
- On receiving funds in the CFB account, the CFB committee will form a sub-committee for fodder procurement and *kalar* (traditional system of preserving fodder) making.
- After selecting the type and quality of fodder, the CFB committee will meet to approve the price and procurement of fodder.

Rules made by CFB committee at Varnu

- Membership fees will be Rs 100 per member
- Contribution at Rs two per mound or Rs 100 per cattle
- Donation of 20 kg of feeder per cattle
- *Kalar* will be opened in drought season only
- Revolving fund will be created in the next eight years keeping some profit margins
- Labour charges, insurance charges, platform cost, etc. will be returned in the account during next 8 years with eight per cent interest.

Types of fodder which can be stored in the open and month of purchase

Storage problems occur only if fodder with high moisture content is stored. The moisture content should be 10–15 per cent. During monsoons, there is a possibility of fodder getting damaged due to excess moisture content. The time of harvesting, storage technique and the duration of storage may affect the nutritive value of fodder.

During drought years, the fodder bank committee obtains financial support from the government to run cattle camps, if these are required.

Experiences of pastoralists

Pastoralists get quality fodder, at the cheapest possible rates and at the right time. It has benefited the community in several ways:

- Availability of good quality fodder during drought periods ensures that the animals remain healthy.
- It is the most inexpensive way to obtain fodder during the drought periods.
- Farmers do not need to sell their animals and migration is reduced.
- Farmers are spared transportation costs



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Local Solutions for Local Problems: Livestock Development in Mountainous Terrains

Organization - Central Himalayan Rural Action Group (Chirag)
Location - Nainital and Bageswar districts, Uttarakhand
Year of Intervention - 2000 onwards
Communities - Indigenous livestock rearers' communities



Central Himalayan Rural Action Group (Chirag) was established in the early 1990s and works in the Himalayas on various aspects of rural development. It works particularly in the areas of education and capacity building, agriculture, horticulture, community based animal husbandry, catchments area protection, watershed development, fodder development and livelihood support. Apart from these it also facilitates access to credit, skills and market, especially for poor women through on and off farm activities. Physically located near Mukteshwar, where the prestigious century old Indian Veterinary Research Institute (IVRI) is located, they felt the need to initiate programmes on livestock care.

Chirag has seven field offices in four districts of Uttarakhand. Fodder development work is underway in 16 villages of Nainital and Bageswar districts and community paravets are working in 30 villages across these districts. The fodder development work was initiated in 2006 while the training of community paravets was started in 2005–06.

Working with People and Livestock

Chirag initiated livestock development work with the communities they work with, taking the support of the local Animal Husbandry departments and research institutions.

Chirag also assisted around 50 self-help groups (SHGs) to access loans from banks for the purchase of good quality animals. Chirag also supports sixty farmers' clubs.

The clubs identify problems related to agriculture and animal husbandry and try to find solutions with the assistance of line departments and organizations. Chirag organizes farmers into livestock producer groups (LPG) who are involved in fodder management, cattleshed management and the production of grass and fodder in community lands. Chirag is supporting other partner NGOs for grass production in community lands. Farmers were taught to prepare silage pits and some also received chaff cutters.

Chirag decided to focus on these activities as they wanted to strengthen the livelihoods of the local people. Typically the objectives were

- (a) scarcity of fodder to be met by developing fodder in forest commons,



- (b) diseases would be addressed by improving preventive care and treatment which would be delivered by trained paravets,
- (c) facilitation of credit to those families who did not possess any animals and
- (d) help in breed improvement to solve the problem of low milk production in the local animals, and thus enable the milk cooperatives to function more efficiently.

In all its work, Chirag followed a set of guidelines which included

- Consensus building at organizational level
- Base line survey and collection of data
- Concept sharing at the local level
- Identification of users and focus groups
- Formation of group and goal setting
- Planning (activity planning, role and responsibility sharing, implementation)
- Setting of monitoring and review mechanism
- Documentation of the process

To improve their 'low' producing animals artificial insemination (AI) activities were taken up with the help of the local veterinary department. This work was to be carried out by the paravets who were trained by the livestock development board. Two jersey bulls were placed at different locations at Silla and Devaldhar farms. Chirag was interested in organizing milk cooperatives for collection and marketing of milk. This, however, proved to be a challenge in these hilly tracts. It was difficult to manage AI with poor infrastructure facilities such as electricity and roads. Collection of milk was also a major problem.

Chirag contacted the newly constituted Uttarakhand Livestock Development Board for training their staff on livestock care. Four people were trained on practices of AI, preventive medicine and vaccinations, use of antibiotics for treating infectious diseases and information on irrigated fodder. However, at the end of the four-month training they were not given any certificates to practice what they had been taught as this would have been against the rules of the Veterinary Council of India Act. In most cases the training they had received found little or no application in the rural context.

Although Chirag had been working on several fronts on livestock development and animal health, they found that many of the approaches recommended by the government were dead end alternatives. Most of the interventions suggested by the different government institutions were cut-and-paste solutions. Interventions largely applicable for rich farmers in well irrigated plain areas were suggested and recommended for farmers living in the mountainous and hilly terrain of Uttarakhand.

Seeking New Ideas and Perspectives

It was around this time in 2006 that Chirag began its interaction with Anthra, who were organizing trainings on livestock in dryland/rainfed contexts. Chirag expressed interest to participate in the training, at one level hoping to derive some new strategies and understanding to deal with issues of livestock in the mountainous Himalayan states.

Seven staff members of Chirag participated in the training. The training, rather than focusing on the animal alone, laid emphasis on the livestock rearing community, available natural resources, existing patterns of livestock care, health and finally looked for locally available solutions which could be promoted.



Putting Knowledge into Action

The trainees soon realized that *animal shelters* were often a neglected area both in training programmes on livestock care as well as with the community. The neglect of shelters is often the underlying cause of several livestock diseases. The trainees began engaging with the community and examining the existing pattern of shelters and related problems. In Uttarakhand because of the severe cold, animal shelters are normally built under the house. To protect animals from cold winds these houses do not have windows and are dark and often damp inside, leading to various health problems especially ectoparasites. If the animals reared are cross-breeds this leads to further problems of numerous tick borne diseases. Usually straw is laid on the floor of the shelter to give warmth. But if this straw is not regularly changed it can become an excellent medium for the growth of pathogenic microorganisms. The trainees discussed these issues with the village community and it appears to have created a tremendous impact on them. Livestock owners began to systematically clear out straw from the shelters and use it in their new compost heaps, which they had recently started under their organic agriculture programme. This benefited the compost heap greatly and also helped keep the shelters clean.



One elderly lady, for instance, took the discussions extremely seriously, and when she returned home she realized that the dampness caused by a leaky roof was perhaps the reason for her animals falling sick so frequently. She shifted the animal shelter to a portion of her house where the roof did not leak and she noticed an immediate transformation in the general health of her animals.

The Anthra training placed extensive emphasis on *indigenous knowledge of fodder* and the need to plan with villagers to enhance knowledge on fodder. The trainees had extensive interaction with villagers, where they mapped out and identified important sources of grazing, seasonal availability of fodder, conflicts within and between villages on fodder and grazing, seasonal shortages of fodder as also identify possible ways to address fodder shortages.

One village was attempting to regenerate its fodder resources in an area of the forest. Both that village and its neighbour had agreed that the livestock of the latter would not graze there till the region regenerated. However the odd grazer continued to allow his/her animals to enter these lands. The village decided to employ a watchman from the neighbouring village, which solved the problem. In another instance they were able to convince the neighbouring village not to graze on a certain patch till it regenerated. In almost all the villages that the trainees worked they undertook plantation of indigenous fodder species such as bimalsiya and oak.



Herbal Medicines: Adding Value to Existing Animal Health Services

Chirag's technical team comprising veterinary doctors and trained staff visit the field areas and extend support to the villagers to take care of their sick animals. Chirag

conducts awareness camps and meetings on care and management of livestock, which includes appropriate breeds, feeding, shelter, preventive care and first aid. Periodic health camps are organized with the help of IVRI, Mukteshwar and the Government veterinary department. Those camps focus on vaccinations, deworming and general check-ups. In 2007, 17 camps were organized in which 917 animals were vaccinated.

This ongoing work was strengthened by Anthra's inputs on the applications of herbal medicines. The trainees learnt to identify and make herbal medicines which they are using. They also teach the community to use these medicines. These have proven to be extremely effective.

New Ways of Seeing and Doing

Following the training by Anthra, Chirag's approach to livestock development in the hilly terrain underwent a rapid change. Those working on the livestock programme realized that the key aspect of addressing livestock problems was not importing new solutions but understanding problems from farmers' perspectives, looking for local solutions and applying it.

Significant changes in the approach included

- Carrying out detailed Participatory Rural Appraisals for mapping and enhancing fodder resources in the forest and other commons
- Addressing grazing conflicts that emerged out of these community interactions
- Increasing knowledge of local plants which have been integrated into ongoing fodder development programmes on individual and common lands

- Medicinal plant collection, storage, preparation of medicines, application and recording of its effects and successes
- Working with local indigenous animals
- Replanning with communities, particularly women keeping local resources in mind
- Adopting an integrated approach that addressed animal husbandry, agriculture and forestry concerns.

Impact and future challenges

Chirag has started training paravets to prepare herbal medicines to treat disease conditions. There is a lot of stress being placed on improving grazing resources particularly enhancing traditional fodders such as bimalsiya, rai and dolni. There have been huge strides taken by people in changes they have made in housing management and an overall improvement in awareness.

A huge success for many interventions is because of the involvement of community in planning, implementation, monitoring and follow-up. There is immense scope for replicating the approach in other villages.



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Holistic Animal Health: Supporting Adivasi Livelihoods

Organization - Tholakari and Girijana Deepika
Location - Addateegala, Gangavaram, Y.Ramavaram,
Rajovamangi Mandals, East Godavari district, Andhra Pradesh
Year of Intervention - 1992 onwards
Communities - Konda Reddy, Koya dora, Konda kammari



A major component of Girijana Deepika's (GD) struggle for control over natural resources, specifically land entitlement, was and still is that the struggle also embodies decisions and choices made by the community regarding the ways to develop the land, crops to be grown, technologies to be employed (e.g. dung and draught *vs* tractors and chemical fertilizers), livestock to be reared and other related issues. GD's strategy and interventions on livestock development need to be very clearly placed within this wider framework of analysis and understanding on Adivasi struggles for access and control of their land and other natural resources.

Livestock in the adivasi context serve the traditional needs – as work animals for agriculture, as the primary source of manure, for transportation and as banks on hooves in times of need. They are also a source of nutrition. Traditionally adivasis have never milked their animals, as they believe that the milk should be left for the calf. Consumption of milk and milk products is a recent development. The average cattle population in a village ranges from 100 to 400 cattle heads. Goat population ranges from 100 to 200 per village. An average household rears between two to five cows, two to four bullocks, one to four young calves, three to four goats and anything from five to 50 poultry. There is a direct correlation between landholding and livestock holding, with livestock numbers increasing with increasing holding of land. This is logical as the main purpose of the cattle is for manure purposes. Many landless tribals own bullocks which they lease out to others during the agriculture season.

According to the adivasis, one livestock unit can provide sufficient manure for $\frac{1}{4}$ acre– $\frac{1}{2}$ acre of land. In the early 1990s when GD began to work with the livestock resources in their area, they documented how several adivasis recognized that there had been a decline in cattle numbers over the years, resulting in shortage of manure. Some of the causative factors for this reduction in cattle included shortage of feed and labour, and increase in diseases and death.

Early initiatives

Early initiatives by Girijana Deepika to address the key problems that affected livestock in their region began in 1992, where six core activists of the organization

¹ Anthra was actively involved with the livestock development intervention of Girijana Deepika from 1992 to 2002.

volunteered to be trained as animal health workers by Anthra¹. The early training oriented the group to the importance of livestock in the larger livelihood of communities. It also helped to identify that there was high mortality and morbidity amongst the livestock and poultry populations in the villages. Black quarter (BQ) in cattle and Ranikhet disease (RD) in poultry were identified as two important causes of death. In 1992, the trained volunteers were able to mobilise vaccination from the government and also purchased vaccines privately, in sufficient quantity to initiate the preventive programme in one village. Early beginnings were made to vaccinate birds against RD and cattle against BQ and HS. The training also equipped the health workers to treat animals using homoeopathic remedies. The early training was facilitated by community contributions. At the time there was huge reluctance as also a general apathy and lack of interest amongst the community to have any interventions—prevention or treatment on their animals. The attitude was neatly captured by an expression used by farmers ‘*Saste Savane*’! – or, ‘let the animal die if it is destined to’.

The activists spent considerable time trying to explain to their own community about the loss, if they allowed their animals to die. They also tried to understand why there was such reluctance on the part of their own community to prevent diseases in animals. At the time

there were very few women who came out to interact with them. Somehow the women were never to be seen, busy in the house or in the fields and unwilling to talk.

However, some farmers volunteered to get their animals vaccinated, and experienced the benefits. When other farmers saw this, it helped to pave the way to create wider interest amongst farmers.

In 1993–1994, 10 additional persons from the community including four women were trained as animal health workers (AHWs). GD was thus able to reach out to a greater number of villages and farmers. Administering vaccinations and treating animals was an important task. The local Integrated Tribal Development Agency (ITDA), extended support to the effort.

In 1995, based on the experience of the past two years, the team felt the need to develop a comprehensive strategy of livestock development and health in the area. It was necessary to undertake a more systematic and in-depth assessment of the issues and concerns using participatory approaches and methods. The communities thus could get themselves involved in the design of the strategy to solve problems faced by adivasis. Some of the important aspects explored and the methods used included:

Table1: Issues explored and tools used

Issues	Tools
Livestock population in the village Who rears what, Distribution of livestock and poultry across landholding and caste and trends Resources in or near the village: grazing, watering, health care, credit, market	Surveys, Mapping resources Transect walk Discussing with farmers Self-documentation in ones own house
Micro-breeding goals, uses of animals, priority of animals in the local production system	Matrix of livestock and their uses, Ranking
Understanding the problems/production constraints experienced by the farmers	Problem ranking PRA
Understanding the relationship between micro-problems and macro issues. Linkages	Mapping, Cause and effect relationships
Investigating each problem/production constraint in depth · Fodder · Water · Diseases · Production losses/economics · Gender issues	Mapping fodder sources seasonally, Seasonal calendar of crops Water resource mapping Seasonal calendar of diseases What you do when your animal is sick Production losses PRA for poultry, goats, cattle Gender divisions in roles and responsibilities
Strategizing – community solutions	Discuss findings with communities and plan ahead

The outcome of this exercise was

1. A comprehensive articulation and analysis of the major problems concerning livestock based on people's participation and analysis
2. A set of concrete recommendations by the community around the livestock question in the context of wider role of livestock in agriculture production and as a source of income

The key problems identified which paved the design of the subsequent health strategy and work on livestock included:



Table 2 Problems in Health Strategy

Problem /Production constraint	Opportunities	Community recommendations	Technical
Fodder shortages Low nutrition level means less productive animals (less milk, dung and draught output), lowered levels of immunity and reduced reproductive performance.	<ul style="list-style-type: none"> ● Indigenous knowledge on fodder trees ● Traditional crops yield diverse and nutritious crop-residues ● Wasteland/fallows available 	<ul style="list-style-type: none"> ● Identify and promote local fodder trees ● Grow traditional crops to make available crop residues ● Information on fodder grasses 	<ul style="list-style-type: none"> ● In-depth study on local fodder species and knowledge ● Training on water and soil conservation techniques ● Working out systems of managing common property resources – land, water and forests
Water scarcity in summer months Lowered crop and animal productivity		<ul style="list-style-type: none"> ● Desilt existing village tanks 	<ul style="list-style-type: none"> ● Water management interventions
Animal Health and Disease Weak and unproductive animals. High economic loss due to high mortality in small ruminants, particularly in poultry, Non-availability of allopathic medicines and vaccinations	<ul style="list-style-type: none"> ● Indigenous knowledge on livestock health ● Culturally acceptable, locally available and inexpensive. 	<ul style="list-style-type: none"> ● Increase people's knowledge on local veterinary practices and home remedies in detail ● Train villagers on animal health care ● Produce educational materials on animal health care ● Mobilize vaccinations from the government 	<ul style="list-style-type: none"> ● Strengthening local systems of health care ● Action-research on ethno-veterinary knowledge for in-depth documentation and validation ● Sharing this information with the communities ● Trainers of trainers ● Training aids
Shelter Enormous loss and death due to improper housing	<ul style="list-style-type: none"> ● Local knowledge available 	<ul style="list-style-type: none"> ● Detailed information on designs, materials 	<ul style="list-style-type: none"> ● Research on appropriate low-cost housing suitable for local environment
Market Poor market linkages, exploitation by traders and middlemen	<ul style="list-style-type: none"> ● Local markets area available 	<ul style="list-style-type: none"> ● Information on marketing strategies 	<ul style="list-style-type: none"> ● Building linkages between local producers and local consumers (e.g. schools, PDS)

Community Ideas Provide the Road Map

These community recommendations played a key role in influencing future work strategies of GD, not only in the area of livestock but related livelihoods such as agriculture, land, forests, water, etc. It also coincided with the recognition of gotti (traditional village institution revitalized and democratized by GD) as a potential forum through which people could be mobilized and act collectively on their problems. The gotti was to provide that context.

There was unanimous consensus amongst GD activists and others associated with the work of GD that:

- i) The AHWs were slowly being recognized as very valuable assets to the community, and there was a clear need to train greater number of AHWs, who could reach out to more number of villages. To be sustainable, it was necessary that the AHW be trained with multiple skills so as to be able to deal with an entire range of issues that emerge in the gottis.
- ii) Solutions to many critical issues such as fodder and disease, appeared to lie within the existing knowledge systems themselves, and there was a pressing need to quickly document local knowledge systems, and widely disseminate the useful information to the people.
- iii) There was a clear need to mobilize the communities, particularly women, to bring pressure on the government to make policies and services favorable to the adivasis. People were also in need of information.



This paved the way to multiple interventions at the levels of research and documentation, training and capacity building, village level technical support and information dissemination, obtaining support from the local government animal husbandry department, and policy advocacy.

The Strategy 1996–2002

Five major components of this phase were:

- 1) In-depth action – research to document, validate and disseminate indigenous knowledge systems related to livestock feeding, ethno-veterinary practices, breeding, housing, management with an underlying concern to look at gender issues (in collaboration with Anthra)
- 2) Consolidation of the approach to livestock and poultry health that embodies promotive health, preventive health and timely first aid, with extension as a key element, with village animal health workers as key to providing this support structure at the primary level. The *Reflect* approach to learning, analysis and action was innovated as a component of community learning and knowledge building on different aspects of livestock health and management.
- 3) Conserving herbal medicines and fodder varieties through community herbal gardens
- 4) Gottis mobilizing government resources particularly for preventive vaccinations
- 5) Advocacy on key policies that impact on livestock and poultry production as a livelihood for adivasi communities

The research and development exercise will not be discussed here. However, a key element of that research which had implications for the village level strategy is worth mentioning. It validated indigenous knowledge, particularly related to the use of herbal medicines in preventive and curative health, fodders, housing, management and breeds. These were widely incorporated into the health strategy at the village level.

The Critical Role of Village Animal Health Workers (AHWs)

In addition to the initial 16 persons who were trained in 1997, 35 women and men were selected by the women's gotti in Rajovamangi, Y. Ramavaram, Addateegla and Gangavaram mandals, to be trained as AHWs. The training was supported by the Integrated Tribal Development Agency (ITDA). The AHWs underwent different training programmes between August 1997 and August 1999. Anthra trained the AHWs in aspects linked to livestock and Yakshi provided training to use the *Reflect* methodology. The aim was to select at least 50 per cent women. But finally only 1/3rd were women. The limitation was that as *Reflect* was an integral component of the training of AHWs, the participants required some minimal literacy skills. Very few women conformed to these criteria. The training was comprehensive and covered different theoretical and practical aspects of livestock and poultry development in the context of adivasi livelihoods. The AHWs were equipped with practical skills which enabled them to train, provide information and advise farmers on different aspects of livestock management such as feeding, breeding, preventive health care, vaccinating and deworming animals and birds, providing preventive and curative practices that combined local knowledge systems, that are fast disappearing, and simple homoeopathic and essential allopathic practices.



Another key aspect of the work has been to monitor the impact of their work. One of the tools used for monitoring was recording mortality and morbidity trends in the village. In the year 2000 an additional six women were trained as community health workers, who were also

closely involved in validating documented herbal remedies. In 2004 another 10 women underwent an integrated training on livestock production and ecological agriculture. Thus in all 71 persons have been trained.

ITDA had indicated that they would pay an honorarium to the first batch of 35 trained AHWs. However this never materialized. Girijana Deepika hypothesized that the health workers could be supported by the community for the services rendered by them.

After 2004, specific training to individuals as community health workers was discontinued as there were several challenges regarding the question of sustainability of these health workers.

Promotive Health

Key elements of the promotive health strategy were, and continue to be, emphasis on good housing, feeding, clean water, and other essential management practices. Traditional knowledge on these aspects which were found to be effective were widely disseminated to the farmers. A prominent component of addressing feeding needs of animals and birds was to motivate farmers to go back to diverse cropping of multiple varieties of local food crops. Government incentives and subsidies since the late 1980s had pressurized many adivasi farmers to shift from food crops to non-food cash crops such as tobacco, cotton and tapioca. Apart from pushing farmers into steep debts due to tenuous and unstable national and international markets, it was a severe threat to the food and fodder feed security of the community. The traditional feeding of poultry and livestock was linked to the straw and grain by-products of the traditional millets, pulses and other crops. With the change in crops, adivasi farmers were no longer able to feed their poultry and animals a traditional diet, naturally rich in minerals, vitamins and proteins.

Realizing the far-reaching implications of changing cropping practices, a vigorous campaign was carried out to emphasize the importance of growing local food crops, as also a process of conserving traditional seeds through a chain of community seed banks, managed by women in the gottis. Women were also encouraged to protect the traditional fodder and grass varieties in the forests, and

wherever required and to plant traditional fodder varieties of trees and shrubs on their private lands.

This period coincided with the initiation of Joint Forest Management (JFM) programmes implemented by the forest department. The JFM attempted to restrict grazing in forests as also carried out plantations of non-fodder varieties such as eucalyptus, teak and pongamia. Communities were angered by this, as their livestock depend critically on forests for obtaining feed and fodder. It is a traditional practice that animals are allowed to graze freely in the forest between January and June. They are herded from June to December. These issues were also discussed in the gottis and communities began to devise strategies to oppose these restrictions.

Extension and Information to Women Gottis

Gotti women participated in workshops and training programmes where they exchanged information and knowledge on management practices amongst themselves, and also learnt new practices from the AHWs. Initially women gotti members were trained in medicine making. Afterwards traditional healers and the women began to make medicines which were to be made available for women in villages. Also, these were sometimes sold in local markets. However, Tholakari soon found that there was limited interest among women to purchase herbal medicines. In 2004, the strategy was altered, and women members were directly trained in the villages.

Other ways to reach out to the community included jatras, melas, slide shows and theatres, which were accompanied by day-long meetings with farmers, where different issues are discussed and debated.



Community Herbal and Fodder Gardens began in 1999, and continues to date. A variety of fodder and medicinal plants have been raised and distributed to individual farmers, gottis, villages and the forest department. The community garden of three acres is now known as the biodiversity park, which is situated in village Thungamadugula, where over 200 fodder and medicinal plants are conserved and multiplied.

Till 2004, traditional healers continued to meet two or three times a year, where they exchanged and shared information. Here, AHWs could learn from their elders. The healers also play an active role in medicine making – collecting medicines and processing. They are also involved in promoting herbal gardens. Many healers grew old in the passing years. In a sense the AHWs and many dedicated women who learnt from the healers, are today's healers and continue the tradition. There are no longer any separate healers meetings now.



Preventive Care: The Experience with Preventive Vaccinations

A key strategy of work was vaccinating cattle, goats and poultry against common diseases. The first year (1992–93), free vaccinations were carried out. Vaccinations were something that people feared. Very few farmers agreed to get their animals vaccinated, and hence it was carried out for free for those who agreed. Government vaccinations were not available. While efforts were made to access vaccinations in subsequent years, there were never any vaccinations available with the government and they had to be purchased.



From the second year, 1994 onwards, payment was made compulsory. It was observed that farmers were unable to pay for the vaccination of all their animals. They were able to pay for one or two but not for five or six they owned, and which played an important economic role in their livelihood. Very poor farmers were not able to pay at all. Each year a mere 30 per cent of the total number of farmers who had their animals vaccinated was willing to pay. Our understanding was that while vaccinations are critical for controlling endemic contagious diseases, it is often impossible for the poor to pay for this public health concern (one needs at least 80 per cent coverage of the entire population to truly effect a sustained control of the disease). While the effects of vaccinations were seen and realized, the question was one of 'who will pay' and 'who should pay'. For some years organizations such as Anthra came forward to help by subsidizing the purchase of vaccines. But this was unsustainable and could not be continued.

What became crystal clear to the GD and Tholakari activists was that the state had to play a critical role here, in providing free vaccination coverage to the animal and



bird population. Thus in 2000, the efforts were shifted towards the organization and getting bringing pressure on the state government to provide vaccinations. Since 2000 till date (2008), GD and then Tholakari have been mobilizing vaccinations for vaccinating large ruminants against HS and BQ, small ruminants against HS, and since 2005, *Peste des petits ruminants* (PPR) and Ranikhet and Fowl pox for poultry from the government veterinary department. The problems were and continue to be:

- 1) *Limited supplies*: The government does not have sufficient supplies to cover the entire cattle/goat/poultry population in all the villages in all mandals.
- 2) *Non-availability of vaccines*: Vaccines have to be administered at the right time. Slight delays can have major impacts. Once an outbreak occurs, it is extremely difficult to control and need fire-fighting measures. Inevitably, the government does not stock vaccines at the time that the vaccinations need to be carried out, and this frequently results in morbidity/mortality in village flocks.
- 3) *Old Stock*: Many times the department hands over stocks that have expired or are approaching expiry date, which cannot be used.
- 4) *Ranikhet disease*: Specifically for Ranikhet disease, it has been a challenge to maintain a secure cold chain for the vaccine till it is administered. If this is not done and the vaccines not administered within 2 hours of opening the vaccine bottle, the vaccines go waste. The vaccine usually comes in larger than 200 dose packets, which is inappropriate for the village-level poultry population.

Issues have to be addressed at the larger policy level, where the government has to make public health a priority concern and match budgets accordingly. Tholakari continues to lobby at local and macro (state) levels for such larger policy changes. The positive experience is that with the constant pressure applied on the government against all odds, the Tholakari activists have been able to ensure that nearly 70–80 per cent of animals and birds have been vaccinated every year in villages where Tholakari has memberships (currently totalling 67 villages), if not at the optimum season, then at some point through the year.

Curative Health: In the early phase, almost all curative work using herbal remedies was carried out by the community health workers, who confidently treated a range of disease conditions such as bloat, colic, diarrhea, fever, cough and cold and other respiratory conditions, wounds, maggot wounds, foot rot, contagious ecthyma, injuries, sprains, fractures, skin diseases, reproductive problems such as retained placenta and abortions, using validated herbal remedies. In subsequent years as dissemination of information has occurred, Tholakari increasingly found that farmers were able to knowingly recognize disease conditions, prepare and use herbal remedies and treat animals on their own. Some farmers who are not confident or do not know how to treat their animals with herbal medicines continue to draw upon the services of the community health worker.

Accessing Fodder from the Forests in Context of JFM: Villages with active gottis challenged the forest department and JFMs, by defying the 'grazing restrictions'. They continued to graze their animals in the forest. They also actively either plucked the non-fodder species, or allowed them to die. These species were obstructing the growth of natural fodder varieties of herbs, grasses, etc.



Then and Now

The impact of Tholakari's work is visible today in over 67 villages across four Mandals and includes a population of approximately 21,000 cattle and an equivalent number of backyard poultry and 1000 goats, where the organization is active. The improvement in health of the animal and poultry populations of the region has resulted in significant reduction in morbidity and mortality amongst village livestock and poultry populations and improvement in production and reproduction.

Year	Large Ruminant		Small Ruminant		Poultry	
	Morb %	Mort %	Morb %	Mort %	Morb %	Mort %
1999	5.1	3.4	8.3	5.8	62.7	5.4
2000	5.4	4.2	7.9	6.7	17.1	1.4
2001	9.1	3.1	9.1	5	10.3	7.1
2002	1.2	0.1	1.7	0.1	8.0	5.7

This has translated into multiple returns for the farmer such as increased production of manure, availability of energy, income, and additional sources of nutrition at the household level.

The strategies discussed above continue to form the core of Tholakari's approach to animal and poultry health in their area. Knowledge has spread to a large number of farmers, which has empowered them to manage and feed their animals in a more effective fashion, mobilize preventive vaccinations from the government and treat their animals with herbal remedies. This multi-pronged approach of promotive, preventive and curative health has impacted positively on people's lives, discussed in some detail below. Additionally it has helped to conserve the local animal and poultry genetic resources of the region.



From 2004 onwards Tholakari strengthened its work in agriculture. It had till then focused on multiple cropping and conserving traditional food crop seeds through community seed banks managed by women, by working on ecological agriculture practices keeping in mind the pivotal role of livestock in the system and extending this knowledge and skill to their members. Women incorporate methods to improve soil fertility (mulching, double digging methods) soil enriching solutions such as *Jeevamrutham*, *Amrithapani* and *Panchagavya*, applications of herbal pesticides, using different kinds of leaves, concentrates of green chillies and garlic and tobacco and neem. This has become a key component of what we would say adds to the 'promotive health' elements of the work.

The government has recognized GD/Tholakari as an organization that has members trained as community health workers, who are competent to vaccinate the animals and poultry in the agency area. Today *gottis* mobilise all vaccinations from the government. Trained AHWs administer the vaccinations. In some villages, the local veterinary doctor accompanies the AHWs and assists in vaccinating animals. The community contribution to this effort is that they provide lunch to the vaccinators on the day that their animals and birds are vaccinated. Vaccinators are also members of the *gotti*.

Animals are de-wormed using traditional remedies such as papaya seeds or gilla pappu (*Entada pursaetha*). When government hospitals provide de-worming medicines, these are mobilized and used primarily to de-worm young calves, goats and poultry. The local government officials have become extremely cooperative and are ready to give the required number of vaccinations. While the situation in terms of supply and availability of vaccines from the government has vastly improved as compared to ten years ago, there continues to be a gap between timely availability and supply of vaccinations and demand. The government veterinarians while being cooperative, express their inability to deliver vaccinations on time, as they claim that they do not have the stock.

Farmers, especially women, are extremely aware about preventive vaccinations and the time of the year when these have to be administered, which is a huge change from the early days when communities were completely

indifferent and disinterested in the overall health of their animals, and totally unaware about vaccinations. There is increased awareness on health care, good housing, good feeding, regular preventive measures and the use of herbal medicines.

Farmers have consciously begun to diversify their farming and are once again cultivating millet, pulses, vegetables, oilseeds etc. such as budama (dryland rice), bajra, maize, jowar, red gram, cow pea, black gram, horse grams and vegetables and paddy on wet lands, in place of cotton, tobacco and tapioca. Farmers are once again being able to use natural farm yard manure to fertilize the soil, as also prepare vermicompost to enhance soil fertility. Farmers say that because of this change, today every household which has sown food crops, is able to feed a variety of crop residues to its animals. The increased presence of diverse crop residues and other byproducts in the diet of animals and birds has resulted in improving their health. Farmers also notice that there is a reduction in diseases because of this and they are able to relate the reduction in incidence of colic amongst cattle to their decision to stop growing tapioca and cultivate food crops in its place.

Gottis are actively using the Forest Rights Act, 2006 to claim community rights to grazing, and to protect and develop the forests.

Women farmers regularly treat their animals for a range of disease conditions using herbal medicines that they learnt in the *gottis*. The predominant cattle diseases they treat include Foot rot, colic, constipation and bloat. In goats the commonly occurring diseases are contagious ecthyma, Foot rot, colic and constipation. Conjunctivitis in



cattle which was a wide-spread problem earlier, has all but disappeared now.

This is a dramatic difference from the early days when farmers were reluctant to get involved with the health of their animals and neglected them, believing they would recover. A striking example of this is that in earlier years there used to be numerous cases of maggot wounds. Now as soon as the animals are injured, they are treated for the injury or wound, and farmers intervene to prevent the wound from becoming a maggot wound.

The most common herbal medicines used by women today are *Ailanthus excelsa* for treating colic in animals and white diarrhoea in poultry, *Azadirachta indica* mixed with turmeric and salt for contagious ecthyma, mouth lesions and skin conditions, a compound mixture of *Azadirachta indica*, *Stychnos nux vomica* and *Terminalia chebula* to treat foot rot, *Holarheana antidysenteric* or Pooredi with Ragi to treat diarrhoea, and different herbal remedies such as *Ximenia americana*, *Annona squamosa*, panasa and *Ocimum sanctum* to treat wounds. Fevers are treated combining *Pergularia daemia* leaves and *Terminalia chebula* leaves and administered as a bolus with jaggery. *Andrographis paniculata* is used to treat fevers in animals, fevers, cold and coughs in poultry as also to build general immunity. *Momordica charantia* leaf juice and *Pergularia daemia* leaf juice are also used to treat cold and fevers in poultry. Nelausiri (and salt is used to treat goat for colic. These were medicines documented from traditional healers and validated by the animal health workers.

Each woman makes it individually and uses it herself. Some gottis make the medicines collectively.



The number of animals (cattle, goats and poultry) has gradually increased. Farmers are selling extra cattle and using it as capital to invest in agriculture, thus avoiding having to take loans on interest. The increase in goats and poultry are adding to the food and income available to the family at the household level.

Challenges Continue

As discussed earlier, possibly the biggest challenge has been and continues to be timely obtaining of preventive vaccinations for the animals and birds. This is extremely important particularly in a context where people are too poor to bare the cost of purchasing vaccinations produced by private companies.

The other pressure that challenges the work continues to be the constant pressure of the government on the farmers to shift from food crops to non-food cash crops (tobacco, cotton and tapioca). We are still struggling to convince the government to recognize the importance of promoting local food crops and to stop promoting all kinds of non-food cash crops. The recent attempt of the ITDA to persuade farmers to grow rubber plantations and jatropa on their lands, where they grow food crops, is yet another example of several such similar programmes carried out in the past.

Another ongoing challenge is continuously having to sensitize officials especially concerned with credit programmes (through Velugu/IKP or bank loans, or loans from ITDA), to stop their practice of insisting on giving credit only to purchase non-indigenous and non-local breeds of large and small ruminants and poultry. The experience of distributing Ongole bullocks, graded Murrah buffaloes and Giriraja birds has been disastrous.

The strategy has succeeded because of several elements, and it is possible to replicate this approach with the following prerequisites. First and foremost, it is essential to have a strong local organization or group, and preferably a women's group, that can ground the work. The work of the group must focus on the multiple concerns of women or communities and their livelihoods, without narrowly focusing on the therapeutic aspects of animal

health alone. Training women and men as community activists and multi-purpose health workers and sustaining their work in villages is critical for the success of the intervention, and these individuals need to be supported, which should either come from the panchayats or the animal husbandry department. These activists must be empowered to be in a position to share and disseminate concrete advice and information to farmers on the health of animals, crop and humans. They must be equipped to vaccinate animals as required. Closely related to this, it is essential that the communities are engaged with other ongoing development issues. Integrating livestock with discussions on food crops and ecological agriculture is critical. Assured supply of timely vaccinations for all diseases from the government is essential.



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Health for All: Humans, Animals and the Environment

Organization - Jan Swasth Sahyog
Location - Bilaspur district, Chhattisgarh
Year of Intervention - 2004 and onwards
Communities - Farmers and Livestock rearers (women and men)



Jan Swasth Sahyog (JSS) was started in 2000 by a team of eight doctors. It works primarily on health issues in Bilaspur district of Chhattisgarh primarily in the Lormi and Kota blocks. JSS works mainly with adivasi communities – Gonds and Baiga. Some villagers belong to other backward classes (OBCs) like Yadavs and some are dalits (SCs) like Satnamis.

JSS started with the primary objective of treating the villagers. About 2000–2500 patients are treated at the hospital every day. Apart from this the organisation has an active village outreach programme in over 53 villages where 104 *swasthkarikartas* or health workers work providing advice and treating simple health problems. The hospital has facilities to test for TB and Malaria and is able to provide the results within 12 hours. They also run crèche facilities in the villages.

While working primarily on human health, the group realized that animal health was equally important because healthy livestock apart from being a source of income and livelihood option was also a source of nourishment. This prompted JSS to start work on the health of livestock also. They also realized that the villagers had to spend a lot of money on treating their animals which they could ill-afford. They knew that with humans, proper awareness coupled with good prevention helped in reducing diseases. They felt the same approach should be applied to animals.

Around this time, JSS approached Anthra. Anthra began to train about 25 animal health workers from the two blocks in 2004. The villagers selected from their village persons to be trained as animal health workers. The training covered issues like appropriate animals and breeds, feeding, clean water, good housing, cleanliness and its importance for good health, preventive care including deworming and vaccination schedules and herbal remedies as first aid. Importantly health workers were trained to identify and prepare herbal medicines for different disease conditions. After being trained, the health workers had several informal meetings with the villagers explaining to them about the importance of livestock and livestock health. The health workers organised discussion *shibirs*, where the villagers are invited to discuss and share their livestock related experiences and problems. Medicines are distributed as first aid at these meetings. *Maha* meetings are held every month in separate villages where the health workers also distribute herbal medicines which they

prepare. The villagers are charged the actual cost. Those who cannot afford the medicines are also taught how to make some medicines themselves. JSS staff and the animal health workers refer complicated cases to trained veterinarians including the ANTHRA team. A magazine “*naya anjor*” brought out by the organisation in the local dialect also contains important information related to livestock health. Through discussions JSS made villagers understand that the presence of health workers is important, as they could seek their advice, as also treat their animals in ways that reduce animal mortality



As a result of these interventions today the team is able to cater to the immediate veterinary needs in the villages they work in. Though the actual work is carried out in 25 villages, around 53 villages benefit from it. There are around 12,000 direct beneficiaries and more than 12,000 who benefit indirectly. Detailed reports of mortality and morbidity in livestock in these villages are kept. Treatment records and the kind of treatment used is also maintained. Thus details of herbal treatments used and their efficacy is also available at a glance. The herbal medicines used are inexpensive and made from resources locally available in the forests. They have been found to be extremely effective to prevent diseases like diarrhea

Through these efforts the problem of fluorosis in the area was discovered when a cattle which showed symptoms was diagnosed by the ANTHRA team. Investigations of soil samples revealed high fluorine content. The team is now working on this as fluorosis can also lead to problems in human beings.

The work has been successful in the area as veterinarians are not easily available and also charge the poor villagers enormously. Cooperation of the villagers makes the team successful in their efforts. The work can be easily replicated in other villages in Bilaspur and also in the rest of Chattisgarh.



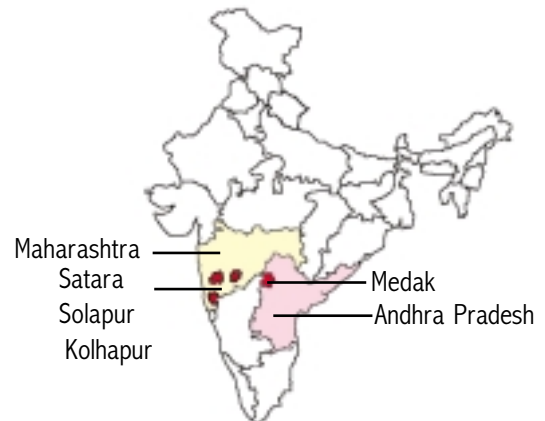
A major challenge continuously faced is that while the farmers would like to rear indigenous breeds poultry, the government is determined to promote and distribute only cross-breds through their programmes. The government also wants to introduce expensive and exotic technology in areas which are remote. The JSS experience though shows that communities can be reasonably self-reliant given the right inputs and support.



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Following the Flocks: Providing Veterinary Healthcare to Shepherds

Organization - Anthra
Location - Medak and Chittoor Districts, Andhra Pradesh;
Kolapur, Satara and Solapur Districts, Maharashtra
Year of Intervention - 2004 onwards
Communities - Agro-pastoralists and pastoralists



Anthra works with pastoralists and agro-pastoralists who rear sheep and goats under settled and migratory production systems in the Deccan region of Andhra Pradesh and Maharashtra. The strategies adopted for these two sets of production systems, while following similar principles, are unique and different in action, to suit the particular needs of the system.

Sedentary Shepherds of Medak and Chittoor

Towards the end of 1990s, Anthra began to work with sheep and goat rearers, around the time when they were in deep conflict with the Forest Department about their grazing and watering rights in nearby forests. These customary rights had been severely restricted by Vana Samrakshana Samitis (or Joint Forest Management committees) newly established in villages. Involvement with one set of problems naturally drew Anthra into engaging with the other major concern of shepherds – poor health and high mortality of their flocks coupled with the absence of veterinary facilities, with resultant losses and expenses. Shepherds were completely dependent on private medical shopkeepers, who had become de-facto doctors, advisors and suppliers of medicines, all rolled into one. Anthra successfully organized shepherds into community forums (sanghams), groups open to men and women of all castes who owned small ruminants, to work on their common concerns and issues. The sanghams collectively formed a larger district-level platform for shepherds. Health naturally became one of the first issues they addressed. The

sanghams regularly met to share concerns and plan actions. Various decisions concerning health care strategy were taken at these collective meetings, which became pivotal to the work.

Migratory Shepherds of Maharashtra

Following Anthra's success with different approaches to veterinary health care in the early part of this decade we felt that the community who most needed our help were the shepherding community who relied primarily on livestock for a livelihood. In 2004 Anthra initiated in earnest a process of locating districts which had high sheep populations, especially those managed under migratory systems. Providing support to these communities was a challenge we were keen to take up. Besides following census figures and government data, Anthra's team made visits to field areas locating villages where shepherds lived, and held informal meetings with the community, and based on these multiple sources of information, identified Satara as a key district, where we initiated our work. Along with collecting information on migratory routes and patterns,

we tried to identify important community members who would help advance the work. Interestingly at that time a movie on shepherds was being made with a senior shepherd, Sakharam Lakde, acting in the film. Lakde had been closely associated with Gunther Sontehimer, the well known German sociologist,. Lakde expressed considerable interest in our intent to work with the community and since then has been a great support to the work with pastoralists. Soon a team consisting of a veterinary doctor and field researchers were assigned to the region, and began to work with the shepherds.

Anthra's work with shepherds, who are mobile for between 6–10 months in a year, has spread to two adjacent districts of Solapur and Kolapur. Conventional notions and approaches to health care systems, educational programmes and agricultural and livestock development programmes have to essentially be different from those that cater to sedentary groups. There are no mobile health care systems or schools. For those who are on perennial migration it is difficult to even decide which their 'home' village is. On the other hand, this mobility also has its advantages as these groups get to travel, see different places and changes, which sedentary farmers may never perceive.

Dhangar and other shepherding groups who migrate do not have access to veterinary services and medicines while on migration and they often suffer heavy losses. The Animal Husbandry Department has no record or track of migrating groups and these animals are seldom covered under state-run vaccination programmes. Often when the season for vaccination is on the animals are on migration and in the wrong district.



Interestingly pastoralists – whether settled (as in Medak and Chittoor) or mobile (as in Maharashtra), rarely approach department veterinarians but usually go straight to a chemist's shop to procure whatever medicine the chemist dispenses at whatever price is quoted. Sometimes the medicines are of old stock well past the expiry date. Thanks to the chemists, shepherds these days heavily rely on antibiotics, especially Terramycin and other prescription medicines, which they indiscriminately use on their animals. If a medicine works well once, they continue to use these arbitrarily without proper diagnosis. If they are unable to treat animals, they prefer to sell their animals rather than face the crisis of the flock dying in their hands. Diseased animals thus enter slaughterhouses leading to public health problems and poor quality meat in the market.

In recent years, newer problems such as diminishing grazing lands, heavy use of chemicals and pesticides on crops sometimes causing death to flocks that graze on or drink from these highly polluted fields and water bodies, conflicts with settled farmers if animals accidentally stray into their fields, and the entry of harmful new technologies such as genetically modified crops and biofuel crops, are compromising the health of the small ruminants.

While 'traditional' in many respects, pastoral groups are often amongst the first to use new technologies like injectable medicines, cellular phones and adopting new breeds, which have brought with them their own set of advantages and disadvantages.



Healing the Flocks

Principles of health care for both sedentary and mobile communities have emphasized promotive, preventive and curative health, developing flock-level disease recording systems, and making the public veterinary health care system work for the communities. The execution of these principles have been different under the two scenarios.

Promotive Health Care

Advise and Information

The local Anthra team consisting of veterinary doctors and community mobilisers-cum-animal health workers visit flocks both in the villages and when on migration, and perform different tasks. They make flock visits and examine the animals, orient shepherds (both men and women) on the management and care of their animals which includes general daily flock management; seasonal diseases, their prevention and first aid; vaccinations and deworming schedules; lamb care; principle of segregation and care of sick animals and safe methods of carcass disposal. Shepherds are encouraged to contact government veterinary doctors when animals fall sick, instead of resorting to self-medication or medical advise of shopkeepers. They are informed about the harmful effects of antibiotics.



Capacity building and training

Men, women and youth are trained on management and health care of their sheep and goats. This includes learning to identify important diseases affecting the sheep and goat, their prevention and first aid, lamb care, housing,

breeding practices, feeding using traditional fodder varieties, the use and application of herbal and homeopathic medicines. Children of shepherding households often participate in these trainings. Shepherds and youth are also trained to vaccinate animals, and are motivated to report disease outbreaks to the local government veterinary hospitals.



Enhancing Availability of Fodder and Water

Shepherds identified the lack of water and fodder as a major constraint. Shepherds have been encouraged to interact with their panchayats to mobilise funds to renovate village ponds and tanks, which are the primary source of drinking water for the sheep and goat as also to get funds to help construct drinking water troughs along the grazing routes. In those regions where shepherds depend upon forests to graze their livestock, they consistently struggle to defend their grazing rights and more recently exploring ways to use the Forest Rights Act to defend their rights to graze in forests. In addition they are introduced to practical ways of enhancing fodder such as growing traditional fodder varieties on private and public lands.

Breed Conservation and Development

The shepherds are encouraged to rear appropriate breeds of sheep and goat, which are adapted to the local agro-ecological conditions to capitalize on in-built immunity levels of a breed and its adaptability to a region. In addition they are encouraged to adopt best practices while selecting and breeding their animals.

Preventive Health

Strategic Deworming

Shepherds have been introduced to strategic deworming practices. Excessive and random deworming was done before Anthra's technical intervention. However, now the dung samples are analysed by Anthra veterinarians or in other laboratories located within the Animal Husbandry Department or other institutions, to identify the worm type and load. The deworming drug to be used is finalized based on these results and if possible in consultation with the local animal husbandry department. If the animal husbandry department has planned mass deworming programmes (as often happens in the case of Andhra Pradesh), the shepherds are actively encouraged to deworm their animals utilizing these services. Alternately the shepherds collectively purchase the drugs in bulk at a concessional price from recognized companies, according to the technical advice they receive.



Vaccinations

Based on the analysis of the seasonality of diseases in the area, and in consultation with the local animal husbandry department, a vaccination schedule is prepared and as far as possible, relevant vaccinations mobilized from the animal husbandry department. Shepherds approach the government for the vaccinations which are to be administered according to the preventive vaccination schedule, and not as a fire-fighting exercise at the onset of an outbreak. The preventive vaccination schedule for sheep consists of sheep pox, Enterotoxemia (ET), *Peste des petits ruminants* (PPR) and *Haemorrhagic septicemia*

(HS) and for goats, only the latter two vaccines. In Maharashtra, Anthrax is an important vaccine administered due to occurrence of the disease.



First Line of Treatment: Encouraging the Use of Herbal and Homoeopathic Remedies

The shepherds are taught to prepare and use various validated herbal remedies, which are extremely useful as preventive medicines and also as first aid. Medicines such as neem oil for skin ailments, as wound healers and as insect repellent, vitex oil for treating arthritis and sprains, *Holarrheana antidysenteric* for diarrhoea, *Ximenia americana*, *Annona squamosa* for wounds, *Pergularia daemia* and *Andrographis paniculata* as immunity builders, *Encostemma axillaire* as a dewormer and *Acorus calamus* to treat ectoparasites are commonly used. They are also taught the applications of homoeopathic remedies. Shepherds' pre-existing knowledge of disease conditions is enhanced with inputs from the Anthra team. They are trained to identify disease conditions, differentiate between diseases and are encouraged to use either validated veterinary herbal remedies and/or homoeopathic medicines as the first line of treatment. They are actively discouraged to use antibiotics for every small condition or accessing the medical shopkeeper and using his 'services' to diagnose and treat animals. Where no response is observed, the shepherds are encouraged immediately to contact the nearest veterinary doctor and seek their technical advice or contact Anthra veterinarians and animal health workers.

Communicating on the move !

The use of cell phones, which almost every shepherd—whether settled or migratory—owns without fail, has enabled shepherds to be in direct contact with service providers from Anthra and the Animal Husbandry Department. They actively seek and are provided with advice telephonically. We have also initiated a proactive short messaging service (SMS) which is sent out twice a month to shepherds reminding them of important health intervention to undertake or warning them of a disease. Over 150 shepherds subscribe to this service.



Activating the State Veterinary System

An extremely critical component of the entire strategy is making the state veterinary health care system work. Sangham/Gutt members, leaders, women and youth are encouraged to contact and report their problems to the local animal husbandry department, and seek their advice. The Shepherd Sangham regularly organizes meetings, where the Animal Husbandry Department representatives are invited to interact with the shepherds.

Developing a Disease Recording and Reporting System – From Flock to District

The absence of an effective disease surveillance and monitoring system has its roots in a poor referral system from village to higher levels in the public veterinary health care system. The problem is much more acute for migratory flocks. Village/flock level disease reporting is the basis for designing an effective prevention and control plan, but it is virtually non-existent. Thus a large chunk of

information on diseases continues to remain out of the annual disease reports published every year by district animal husbandry departments. Anthra developed a flock level disease recording calendar / booklet with the active participation of shepherds, as a tool for shepherds to record the changes in their flocks and disease morbidity and mortality on a monthly basis. Information such as additions to the flock (new purchases, new births, animals taken on 'sharing basis'¹), subtractions from the flock (sale, deaths, 'sharing basis') and diseases can be recorded. Visits by service providers and a record of vaccination and deworming is also recorded. The consolidated information becomes useful as an input for planning interventions at the household, village and divisional levels.

Key Milestones During the Last Four Years

The Settled Shepherds of Medak

In 2004 the process of organizing shepherds into sanghams was initiated in 15 villages spread across five mandals in Narsapur division, Medak district with a population of approximately 15,000 sheep and 6000 goats. Shepherds completely depended on medical shopkeepers and never contacted the government veterinary department. There were hardly any shepherds who were using preventive vaccinations, and they dewormed their animals with dewormers purchased from the medical shopkeepers. There was close to cent per cent use of antibiotics to treat diseases, including conditions such as 'bloat' and non-infective wounds! There were extremely low levels of interaction between the formal state veterinary services and the shepherds. In the first year, the major diseases that were observed in the sheep flocks were sheep pox, ET, contagious echthyma, 'Nallamobbu' (pneumonic symptoms) and cold and cough (which occurred in all flocks in almost all villages), diarrhoea, bottle jaw, mange, ticks and lice, abortions in some flocks and lamb deaths due to lamb scour. Very few shepherds actually recognized and identified PPR as a separate disease, as they thought it was a regular kind of diarrhoea. Symptoms of blue tongue were observed in a

¹ Traditional systems exist in villages where a shepherd gives animals to another shepherd and they share the offsprings. The lender continues to own the original animals.

few flocks. Shepherds were highly skeptical about the advice offered by Anthra.

By the second year, 2005, 11 sanghams sustained their collective with 178 members who owned 12,500 sheep and 4500 goat. Four villages failed to sustain their sanghams, and despite a lot of efforts by Anthra, the members and leaders were unable to arrive at a modality to work collectively. By 2006–07, two more sanghams stopped functioning due to inability to take on leadership and due to severe caste tensions. Thus the number of active sanghams was reduced to nine with 139 members, who owned 9200 sheep and 3450 goats. Interestingly, by the fourth year 2007–08 the success of the sanghams in addressing several problems including health, appears to have spread to several villages by word of mouth, and shepherds from various villages began to contact the activists and frequent the office, seeking help to form sanghams in their villages. Sangham activists began to mobilize the shepherds in 11 additional villages where they initiated the process of institutional building. Today the work reaches out to about 400 shepherds in 24 villages, with 20,000 sheep and 7000 goats, of which one village lies in an area where shepherds migrate for between 9–10 months in the year.

Despite several efforts to ensure full participation of women, there continued to be poor involvement and hence a significant strategic decision was made in 2007–08, to organise women into exclusive women's groups. **Today there are 24 women's groups, with 335 members from 20 villages, who are federated onto a common platform, and also operate a community fund to assist shepherds in strengthening their livelihoods.**



Extension, Prevention and Cure

In the second year of our work, the local animal husbandry department was formally requested to assist the sanghams with services that included providing free preventive vaccinations for specific diseases, deworming animals during the government programmes, disease diagnosis and treatment of the animals and post-mortem examinations.



Anthra veterinarians and animal health workers regularly visited the flocks, advised shepherds, and carried out training programmes for women, youth and elderly shepherds.

The strategy to deworm animals was initiated in the first year and included testing dung samples, followed by bulk purchase of deworming drugs and mobilizing dewormers from the animal husbandry department in the event of their having a mass deworming programme. Each village sangham opened their own bank accounts operated by two leaders, and they took responsibility to collect the payment made towards deworming medicine which was deposited in their account. Animals were dewormed in January, April, August and December 2004. From the second year onwards, the frequency of deworming was reduced, aimed at convincing shepherds about renewed strategies being advised by research institutions such as CSWRI², which is to deworm twice a year. In 2005, campaigns by village sanghams and Anthra at village, district and state levels, backed by scientific analysis of goat dung samples (done by the Andhra Pradesh Veterinary University), which showed the presence of

² Central Sheep and Wool Research Institute, Avikanagar, Rajasthan.

worms, were successful in persuading the government to include goats in their mass deworming programmes, something they had refused to do until then.

In 2004–05, sheep were vaccinated against enterotoxemia (ET) and FMD, which were mobilized from the government veterinary department. Nearly 30–40 per cent of the shepherds in each village refused to have their animals vaccinated as there was a general belief that vaccinations increased the risk of animals falling sick. From the 2nd year onwards Anthra assisted the sheep and goat rearers to mobilise sheep pox, ET and PPR vaccines from the animal husbandry department, to vaccinate sheep and goats. Obtaining HS vaccines continued to be a contentious issue between district officials and shepherds. While HS vaccine is routinely administered and found effective in reducing the incidence of respiratory conditions in sheep and goat populations in other parts of Andhra Pradesh, it has never been used for small ruminants in Medak district. In 2005, Anthra convinced the district animal husbandry department, about administering HS on a pilot basis. Morbidity and mortality records carried out that year revealed a definite reduction in incidence of 'Nallamobbu', in those flocks which received HS vaccination. The concerns of the department were justified in that to date there is no definitive diagnosis that the 'Nallamobbu' condition is HS. Moreover, HS vaccine produced in India provides protection against *Pasteurella multocida* and not *Pasteurella haemolytica*, which is the organism causing HS in small ruminants. The University cautioned that vaccinating sheep and goat with the available HS vaccine would at best provide partial immunity. Today, sanghams directly approach the animal husbandry department and mobilise vaccinations.

In the beginning, the vaccination team consisted of the Anthra veterinary doctor, trained animal health workers and staff of the animal husbandry department. But by the second year, village youth who were trained to vaccinate, joined the team, and by the fourth year, there was a cadre of four–five shepherd youth from each village, numbering nearly 70, who performed the bulk of vaccinations, guided by veterinarians.

Efforts have been continuing to demonstrate and encourage shepherds to use herbal and homoeopathic

medicines. In 2005, herbal kits were distributed to 250 women shepherds which contained medicines like fever powder; diarrhea, cough and cold powder; wound powder; neem oil, bloat powder, etc. Neem oil has been a huge success and used for foot rot and skin diseases, and while all the sanghams have been taught to make the medicines, some continue to produce it collectively, while some other shepherds prefer to purchase it from other sanghams. To prevent blue tongue, Anthra advised the shepherds to regularly fumigate their sheep sheds with herbs and cover stagnating water pools which were breeding grounds of mosquitoes. Whole blood and serum samples were collected from morbid animals and sent to the University for testing. Apart from blue tongue 'Nallamobbu' continued to be a problematic disease condition with morbidity and mortality reported by shepherds. Certain flocks were observed to suffer from chronic abortions. Blood samples were collected and sent to the animal husbandry department, who in turn passed them on to the Veterinary Biological Research Institution (VBRI), Hyderabad. The samples tested negative for brucellosis.



Many shepherds found it extremely difficult to use herbal powders to treat large number of animals in a flock, and suggested that a tincture or liquid form would be far more convenient. Responding to the limitations of herbal powders, healers, who meet regularly each month, decided to pilot test a tincture form of the medicinal herbs. They prepared a mother tincture derived from 30 herbs commonly used in their medication. The extract is now being used by shepherds on a pilot basis, and would be useful to build immunity and cure respiratory tract infections.



By 2007–08, the fourth year of work, shepherds gained confidence in using homoeopathic medicines to treat diarrhoea, fevers and respiratory tract infections. They have successfully used homoeopathic remedies to prevent and treat blue tongue.

Initiating Flock Recording System

The disease recording tool was developed and tested in 2006, with 20 youths from 10 villages. Their experiences and feedback helped fine tune the calendars. Some of the shepherds did not want to record the information as they felt this may draw attention of the 'evil-eye upon their flock'. In May 2007, 60 youth and elderly shepherds from four villages volunteered to participate in a year long pilot testing of the flock dynamics calendar, which lasted till June 2008. By the end of the study it was found that 50 per cent of the shepherds were in a position to record the information on their own. The children of these families were extremely excited to learn to record the information and many have now begun to help their parents, which they do in between school and studies. It is an innovative way for children to learn about their parents' livelihoods.

Voicing Demands

From 2005 onwards, shepherds began to interact with the animal husbandry department and voice their concerns. Each year they have two events where they ensure that they meet government officials. In March, the shepherds organise an annual general body meeting, where apart from discussing their achievements and sharing problems and strategies, they invite local government officials from relevant departments such as animal husbandry and forest and panchayats, so that they can interact with them and present their demands. In addition they have an annual 'judging event', where officials also participate. In 2007–08 in addition to the regular events, they organised an all-day dharna in front of the local animal husbandry department where they submitted their demands for a list of vaccinations and other services. Over 300 shepherds, including over 50 women, assembled and they refused to move till the Additional Director emerged from his office/field visits and gave his verbal assurance to the shepherds. Shepherds regularly join larger state and national level mobilizations on issues. For instance they have been active in the run up to the enactment of the Forest Rights Act in solidarity with larger state and national level formations.



Disease Profile Over the Last Four Years

In December 2005, which was exactly two years since the interventions began, a detailed morbidity–mortality survey of nine sangham villages and five non-sangham or non-intervention villages located near the former was

carried out to compare the impact of our intervention on health issues. Interestingly the sangham villages reported fewer number of diseases in their flocks (seven) than the non-sangham villages (12). The sangham villages did not report diseases for which animals had been protected (ET, Sheep pox, PPR) and had been dewormed.

Table 1: Diseases Reported in Village Surveys (December 2005)

Sangham villages	Non-sangham villages
Diarrhoea	Diarrhoea
Foot Abscess	Foot abscess
Nallamobbu (Pneumonia)	Nallamobbu
Cough and cold	Cough and cold
Mange	Mange
Abortions	Enterotoxemia
Blue Tongue	Blue Tongue
	Goat pox
	Contagious Ecthyma
	Worms/Bottle Jaw
	PPR
	Sheep pox

There was no significant difference in morbidity between the two sets of villages, except in sheep flocks, where sangham villages showed three per cent lower morbidity. There was three and four per cent lower mortality amongst sheep and goat flocks respectively in sangham villages.

Table 2: Morbidity–Mortality Study in Sangham and Control Villages

Sl.No.	Sangham/ Control	Morbidity (percentage)		Mortality (percentage)	
		Sheep	Goats	Sheep	Goats
1	Sangham villages – 9	19	23	10	12
2	Control villages – 5	22	23	13	16

In both sangham and non-sangham villages, Nallamobbu and blue tongue were the two diseases with highest incidence in sheep flocks. Goats suffered from Nallamobbu and foot abscess. Interestingly, the incidence of blue tongue (23.2 per cent) in adults as also lambs (26.8 per cent) and mortality due to the latter (adults 10.3 per cent) and lambs (14 per cent) was significantly lower in sangham villages as compared to the flocks in control villages (morbidity 36.08 per cent; mortality 25.83

per cent). The latter figures are interesting, as they do reflect perhaps an overall situation of improved health status, which resulted in lesser numbers of sheep getting infected and then dying.

Table 3: Morbidity and Mortality levels of Blue tongue in Sangham and Non-Sangham villages

Sl.No	Sangham/ control	Morbidity (percentage)		Mortality (percentage)	
		Adult sheep	Lambs	Adult sheep	Lambs
1	Sangham village	23.22	26.86	10.38	14.00
2	Control village	36.08	29.00	25.83	21.31

In June 2006, a Masters Student from Netherlands, who interned with Anthra, studied the impact of diseases on the marketing strategies of shepherds rearing sheep and goat. Her findings confirmed the previous years' survey results that there was marked improvement in the health of animals of shepherds who were members of sanghams. Her study revealed that a higher proportion of non-sangham members indicated a lack of knowledge about disease prevention and poor availability of medical care as a problem compared to sangham members. Non sangham members indicated that the local medical shop was the primary source of animal health care, and then the government veterinarian. Sangham members prefer the local animal husbandry department and the veterinarian or animal health worker trained by Anthra. Sangham members have 99 per cent chance of having lower mortality rates and lower expenses on animal health care as compared to non-sangham members.



In 2006–07 there were severe outbreaks of sheep pox and goat pox but a very low incidence of blue tongue (5–10 per cent) and PPR, as compared to the previous year. Other diseases included foot rot, respiratory conditions and lamb mortality. There was mortality in a few goat flocks in April–May 2007 due to HCN toxicity caused when goat flocks grazed on the fruit of *Caullophyllum inophyllum* present in forests. In 2007 and 2008, shepherds who migrated on short distances to villages in Medak where Bt cotton was cultivated, reported morbid symptoms including cough, respiratory symptoms, diarrhea, and anorexia, in the flocks located in those villages, with higher incidence in the age group 6 months to one year, particularly when the animals consumed fresh, tender Bt cotton leaves.

In 2007–08 the information recorded by shepherds using the flock dynamic calendars revealed that between October 2007 and February 2008 the common diseases were diarrhea and respiratory conditions with very low incidence of foot rot. There was minimal incidence of blue tongue in October 2007, but there were renewed incidences in February–March 2008, due to unseasonal rains with an increase in mosquitoes. The second blue tongue outbreak had not been observed in the earlier years. A few PPR outbreaks were observed in flocks which had not been vaccinated. Abortions in flocks varied between villages and ranged from two to five per cent. Overall there was significant decline in morbidity and mortality of all diseases, especially the contagious diseases such as ET, PPR, sheep pox, etc. However, the respiratory related infections continued. Blue tongue has been controlled through the intensive practice of fumigation and homoeopathy. Lamb mortality declined from 14 per cent in 2005 to five to ten per cent in 2008, and this remains as an area for further intervention.



Migratory Shepherds of Maharashtra

Anthra's work with migratory pastoral groups has posed unique challenges. The work began in Satara district in 2004–05. In the early years, the biggest task was to establish contact and build trust with the community, which was a mind-boggling exercise, given that the community—men, women and children—were on the move for most of the year. We were fortunate to be able to bring on to the team young representatives from the community, who were trained as organizers, documenters and animal health workers. Major efforts had to be made to trace and map the migratory routes and hence a lot of time and energy were spent in following the flocks trying to establish contact. A shepherd and flock located at one point would be in a completely different location within a week or ten days. It took time to understand the production system and the seasonality of the system and its people, before any 'health interventions' could actually get underway. A breakthrough was made with a detailed migratory mapping of various groups and their movements, which helped immensely in visualizing the spatial and temporal aspects of the work. The main migratory routes identified included the one to the west towards the western ghats which is usually fixed. Villagers in the western ghats and down in the Konkan usually welcome these flocks as they are a valuable source of fertilizer for their rain leached fields. On the other hand shepherds sometimes migrate east towards the districts of Beed and Latur. These routes are new and pose dangers. Often they run into conflict with settled farmers or non-pastoral nomads over resource use. This can be fatal often resulting in crimes such as theft of sheep and loss of life. The crops also keep changing. Recently with the spread of genetically modified crops especially in the districts of Beed and Aurangabad, sheep and shepherds have increased problems related to livestock health.

In the first year, Anthra was in active communication with nine gutts or groups of migrating shepherds from 10 villages with 181 shepherds owning 9253 sheep and goats. By 2005–06, our work spread to 11 gutts, where there were 273 shepherds who owned about 12,000 sheep and goats. In some villages, like Mirdhe, the work could not be sustained, as the shepherds sold their sheep

and purchased tractors and began to migrate towards Marathwada, Vidharba and Konkan region of Maharashtra, with their tractors. In other villages the lack of leadership amongst the community made it difficult to continue work. In 2006–07 the focus continued to be in these 12 villages with 237 shepherds who owned 12,731 sheep and goat. By the fourth year, Anthra's work had spread to 16 gutts (three of which are in Kolhapur district, and and in Solapur district) where there are 334 shepherds and 15,600 sheep and goat population.



Many activities are initiated on a collective basis from June to September when the pastoralists are in their home villages. Training programmes are usually conducted during this period, and cover aspects of health care, management, prevention and introducing the use of alternate medicines. Special trainings have been carried out related to housing as the rainy season is also the season for infectious diseases like foot rot and blue tongue which had been visiting the flocks for the past few years. This time is utilized to collect dung samples of sheep flocks to analyse for presence of worms so that the correct medicine in the correct dose can be recommended.

The real challenges begin when the animals begin migration after the rains recede. Some of the frequent problems during migration are the sudden death of animals due to disease, non-availability of medical services and medicines, loss of animals to predators like wolves and theft of animals by other nomadic groups. Harassment by farmers or the forest department occur when animals accidentally stray into privately owned farms or the forest. Recently bad agriculture practices such as the use of excessive chemicals, use of genetically modified seeds

such as Bt Cotton, on which migratory flocks graze, are also leading to problems with livestock health.

Preventing Disease: Advise and Action

While flocks are 'at home', the Anthra team consisting of veterinary doctors and animal health workers, regularly organize meetings in gutts to discuss their concerns. Here they are intensively taught about diseases, herbal preparations for disease conditions like fever, diarrhea, bloat, colic, wounds and foot rot. They are also taught preparation of medicines like neem oil, tick oil, flea powder, etc.

Come September, the families leave the villages with their flocks and migrate for the next eight to nine months. The Anthra teams are assigned groups which they visit on a regular basis. As migratory routes are more or less fixed it is not difficult to follow the flocks and make regular visits to ensure all is well. Flocks are visited at least once a month. During this visit they check for unhealthy animals, and whether any preventive programmes such as routine de-worming or vaccinations have to be undertaken. In such cases the team seeks the help of the local animal husbandry department in that district. Each shepherd is also being given a record book for maintaining the health profile of his/her flock and this is a record which is with them when they migrate.

In 2005–06, dung samples were collected from different flocks and examined. Most of the animals were infected with round worms such as *Haemonchus* sp and *Strongyloid* sp. a total of 1414 animals were de-wormed in the first year. Thereafter regular analysis of dung sample had been carried out each year, based on which de-worming medicines are prescribed and used.



During the first year of work, Anthra managed to mobilize government support to administer essential vaccinations in the flocks. However as the doses available with the government were inadequate, Anthra had to purchase vaccines and administer them to the animals to ensure that the entire group was covered. Some of the problems experienced with government veterinary services included unhygienic and occasionally incorrect methods of vaccinating animals. In 2005–06 about 6600 animals were protected against ET and Anthrax. In 2006–07, the portfolio of vaccinations administered increased and included Enterotoxaemia, PPR, Anthrax and HS. Some shepherds have been able to access vaccinations from the local government veterinary services, when they were at 'home base'. But whenever flocks are on migration (September to June), the Anthra team goes to where the flock is located and administers the vaccines. By the third year, animal health workers who had been trained from the community were single handedly able to vaccinate the flocks. By 2007–08, flocks were being vaccinated against ET, PPR, HS and sheep pox. There was an outbreak of sheep pox in Satara district in flocks which were not part of the Anthra shepherds' groups, so the Anthra shepherds were immediately advised to vaccinate their sheep against sheep pox.

While the early days saw vaccinations being done exclusively by Anthra vets, they were later joined by animal health workers. Today many shepherds of the older villages are competent and confident in vaccinating their sheep and goat flocks against ET. A major achievement has also been that in 2007–08, shepherds across different districts submitted a written demand to the government authorities for vaccinations. Wherever government vaccination stocks are insufficient, vaccinations are purchased from the open market.

In the beginning, the shepherds were using all kinds of antibiotics to treat every small ailment. Broad-spectrum antibiotics like tetracycline and penicillin were the 'cure all'. Many shepherds used wrong methods of administering antibiotics, which often resulted in death. Anthra's persistent efforts to inform the shepherds about different ways of approaching disease using alternate remedies gradually began to pay off. Gradually a few shepherds

began to use the herbal and homoeopathic remedies, while others continued to be disbelieving, as they sought 'quick fix' instant solutions. Those who began to see the positive effects of the herbal remedies shared their experience with others, resulting in a slow but perceptible change. By 2006–07 about 20–30 per cent of the shepherds had begun to use the herbal medicines. There was a lot of demand for bloat, diarrhoea and flea powder as also foot-rot powder which was used for foot-rot. Today women shepherds are successfully using herbal medicines and getting good results.



Many shepherds found it difficult to use herbal powders, and in 2007 homoeopathy remedies were introduced to the shepherds, who were encouraged to use these as part of their preventive regime. Being easy to administer, many shepherds appreciate the ease of use.

In the monsoon of 2005–06, fodder demonstration plots were established in Sulwasti and Tal-Phaltan villages of Satara district. Many shepherds visited these plots, and this evoked a lot of interest amongst them. In the following year, many shepherds began to ask for fodder seeds which they could sow in their fields near their homes. They began to graze their pregnant and lactating ewes on these fodder plots, for a short period each day, once they returned home after grazing. The shepherds observed good weight gains in their lambs after feeding the ewes on such fodder. Anthra also encouraged shepherds to plant perennial fodder trees on their lands.

The popularity of cell phones and the adaptability of the shepherding community to use this has been a great boon to this programme. Shepherds are in a position to

contact us when their animals are sick. More importantly, a proactive service, wherein short messages are sent to shepherds twice a month with important advisories concerning health of their animals, has been started in 2008.

All these efforts have helped build confidence of the community in our work.

Women on the Move

Perhaps the most challenging yet exciting component of the strategy has been working with pastoralist women on the move. Women have been organised into groups in villages where flocks are mostly stationary throughout the year as also with migratory groups in Solapur and Satara districts. Through discussions it emerged that backyard poultry is important for pastoral women on migration, and also an activity where they experienced a lot of loss. The birds move with the family, and are an important source of nutrition for the family. Women wanted inputs on how to reduce the losses, and so Anthra began to train them to vaccinate birds as also prevent diseases through better management and applications of locally available herbs in prevention and first aid. Women have also been trained to prepare concentrate mixtures from local resources, which they have begun to use to fatten lambs, which they sell during festival months. For stationary groups which also do agriculture, women are trained in ecological farming practices including techniques of preparing vermicompost in baskets. Women in some of the migratory groups have begun to vaccinate their hens, and offer clean drinking water mixed with potassium permanganate. In the last year the women report a considerable reduction in morbidity in the birds and absolutely no mortality.



Tracking Flock Dynamics:

A booklet named Dainandini was developed to record important aspects of a hepherd's flock including disease morbidity and mortality, vaccination and de-worming , changes in the flocks and visits by health providers.. The AHWs have been trained to record information in these booklets. So far 110 booklets have been distributed to shepherds who are active memberds of the gutts.

Disease Profile

Sheep and goats suffered from a range of diseases such as ET, FMD, anthrax, respiratory conditions, foot rot, diarrhea, sudden toxic deaths and bloat. A few flocks suffered from abortions. In July 2005 there was a major blue tongue outbreak in the region, with 41 per cent morbidity and 20 per cent mortality in five of the villages where Anthra had initiated its activities. An intensive campaign was carried out with shepherds encouraging them to fumigate their sheds every evening using a mixture of herbs. The following year, the entirety hamlet of Sulwasti fumigated their sheds regularly and there was not even a single report of blue-tongue in their flocks. In 2006 and 2007, along with the diseases mentioned above, while flocks were on migration there were sheep pox outbreaks. Wolf attacks especially on young lambs continued to be a major challenge for shepherds on migration. In 2006, lamb mortality in flocks ranged between 12 to 15 per cent. In 2007, there were reports from migratory shepherds whose animals had to graze on Bt cotton fields that animals were exhibiting symptoms of coughing with nasal discharge, severe diarrhea, anorexia followed by death in some cases. The diseases mapped in the new district of Kolhapur were similar along with reports of high morbidity and mortality due to fever and respiratory symptoms.



Serum samples and whole blood samples were collected during disease conditions such as blue tongue, and mass abortions and sent to veterinary colleges in Shirwal and Parbhani for testing. The samples tested positive for blue tongue, and this information was shared with the shepherds.

Today the positive impact of the health strategy is clearly evident. There has been a significant decline in morbidity and mortality due to blue tongue, ET, sheep pox and anthrax. Morbidity due to the latter diseases occurs in those flocks which continue to be unprotected. Foot rot, diarrhea and respiratory conditions still occur but with reduced incidence, and shepherds are now better equipped to manage the diseases. Infertility in a few flocks has been observed. Lamob mortality in flocks has reduced significantly and ranges from eight to 10 per cent.

Achievements and Challenges

The past four years has seen some major transformations amongst the shepherd community—both in settled and migratory—productions contexts, and consequently there is a positive impact on the health of their animals. Shepherds have always been extremely well-informed about their animals, and this basic knowledge has been enhanced and sharpened, particularly with respect to the emergent diseases such as blue tongue and PPR. They have greater awareness on preventive practices, management, and the applications of herbal and homoeopathic medicines. A huge change is that the shepherds are pro-actively accessing the AHD staff, reporting their problems, demanding vaccinations and deworming, as also accessing the government veterinarians for advise, treatment and for conducting post-mortems. Shepherds are using different strategies to put pressure on government and make them respond to their problems. For instance they have successfully used the media to highlight disease outbreaks and how government veterinarians have often been negligent and refused to visit their village, despite repeated appeals. There is greater openness amongst the shepherds to adopting other promotive and management practices which underline good health such as the need to be concerned about growing fodder trees, meeting water needs, developing natural grasses, housing, lamb care

management and the need for them to change from chemical or GM farming to ecological farming.

Women shepherds have come out forcefully to participate, ever since the creation of the exclusive groups for women shepherds where they are able to discuss several concerns regarding their livelihood and their own health. The shepherds are using the community based disease monitoring tool and the 'Dainandini' to record changes in their flocks, which is the first step for reporting from village level to local AHD staff.

By year three we saw a huge reduction in shepherds directly approaching the medical shopkeepers, and instead they began to actively contact the Anthra veterinarians, AHWs as also the local veterinary doctors, reporting diseases and requesting vaccinations, and advise. Most critically, there was a huge decline in indiscriminate use of antibiotics.

Cell phones have emerged the most useful 21st century technology for shepherds, who constantly use their phones to seek advise or treatment, report problems and to network and exchange information on diseases. A lot of advice and information is transmitted through the cell phone. This is particularly useful for people on the move.

The non-availability of timely vaccinations continues to be the major challenge experienced by the shepherds. The lack of interest amongst the larger community of researchers and scientists within the government system to systematically investigate health problems that are experienced and reported by shepherds is a serious lacunae and area of concern. The puzzles around



'Nallamobbu', the doubts surrounding HS, the reluctance to investigate disease syndromes noticed by shepherds when their flocks graze on Bt cotton fields, all these continue to be serious challenges that confront the shepherds.

In Conclusion

A holistic approach to small ruminant health care, which draws upon promotive, preventive and curative health integrating different systems of medicine, coupled with making the government veterinary system work to the advantage of the rearers, has been crucial for a deeper understanding of approaching health with a historically neglected community. The role of an organised group—sangham or gutt—cannot be overemphasized, along with strong participation of women.



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Diversity of Poultry in Adivasi areas of East Godavari, Andhra Pradesh



Denki



Mattedu



Koppu



Medajari



Rencha/Agees



Aseel

This collection of case studies captures the experiences of groups who have made a difference, in their work on livestock with marginalized communities. These voices represent various agro-ecological zones in India.



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