

LEAD

Communication Platform



CEE
Centre for Environment Education

Centre for Environment Education

	 <p>Schweizerische Eidgenossenschaft Confédération suisse Confederazione Svizzera Confederaziun svizra</p> <p>Swiss Agency for Development and Cooperation SDC</p>	
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Executive Summary

The Livestock, Environment and Development (LEAD) is a multi-institutional initiative of the Food and Agriculture Organisation (FAO) of the UN, formed to promote ecologically sustainable livestock production systems. The work of the Initiative is largely focused on issues and options related to the protection and enhancement of natural resources as affected by livestock production, while alleviating poverty. The objective of the Virtual Centre of the LEAD Initiative is to improve communication and enhance the relevance of research and development issues related to livestock - environment interactions. The LEAD Platforms together enable the global community to access information on livestock and environment interactions that is essential to achieve rural sustainable development. These language platforms – in English, Spanish, French, Chinese and Russian – operate as extensions of LEAD in different regions and work as networks attached to the Virtual Research and Development Centre. As per a study conducted in 2003, the Virtual Centre is one of the most popular sites for this field, being thrown up within the first ten sites in all search engines when a person searches for ‘Livestock and Environment’.

The LEAD India Platform is hosted jointly by the Centre for Environment Education (CEE) and the LEAD Advocacy Network (LAN) anchored by Watershed Organisation Trust (WOTR), Maharashtra. The following report enumerates the communication products and services of the LEAD India Platform – both electronic and non electronic. The report also briefly touches upon the Lead India Platform’s experiences with Outreach, platform administration and linkage with the Lead Advocacy Network (LAN). The impact of the project lies in having been able to use new technology to create awareness and spread knowledge among even rural beneficiaries, often through agencies who have access to the net and who enabled the flow of knowledge from the Virtual Centre to the actual beneficiaries. The key message that emerges from the project is the need for a balanced view of the livestock sector, taking into consideration the negative impacts of livestock production on the environment and ecology, but also accepting and improving its role in alleviating poverty. In short, ecologically sustainable livestock production is the need of the hour.

A. Introduction

A.1 What is LEAD?

LEAD (Livestock, Environment And Development) is a multi-institutional initiative of the Food and Agriculture Organisation (FAO) formed to promote ecologically sustainable livestock production systems. It promotes research on livestock environment interactions; creates awareness on the complex interactions of human needs, animal production and the sustainability of global natural resources. It facilitates in developing guidelines, methodologies, processes for analysis; and decision support tools for decision makers, practitioners and implementers to promulgate policies that encourage use of sustainable production systems.

The LEAD Initiative is an inter-institutional project with its secretariat in the FAO. This initiative is supported by the World Bank, the European Union (EU), the Ministère des Affaires Etrangères (France), German Federal Ministry for Economic Cooperation and Development via GTZ (Germany), the Department for International Development (United Kingdom), the US Agency for International Development (USA), the International Development Agency (Denmark), the Swiss Agency for Development and Cooperation (Switzerland), and the Food and Agriculture Organization of the United Nations (FAO).

The work of the Initiative is largely focused on the protection and enhancement of natural resources as affected by livestock production, while alleviating poverty. The earlier work of LEAD has identified, at a global scale, the consequences of increased pressure on grazing and mixed farming systems and the dangers of the shift to industrial modes of production. It has highlighted the close and complex interaction between government policies and the environmental impact of livestock production, and identified a large number of technologies which are available to mitigate the negative effects in all different production modes, provided the appropriate policy framework is in place. Subsequently, the initiative mobilized funding for critical follow-up needs.

In particular, the Initiative aims:

- **to improve** communication and enhance the relevance of research and development issues regarding livestock-environment interactions, by establishing the Virtual Centre for Research and Development in Livestock Environment Interaction. The Virtual Centre promotes multidisciplinary research and development activities and increases awareness among key stakeholders of the complex interactions of human needs, animal production and the sustainability of global natural resources. The Virtual Centre operates both globally (based at FAO, Rome) and through French and Spanish speaking language platform, hosted by partner institutions (CIRAD and CATIE, respectively). In addition, further studies are being launched to fill the gaps in current knowledge of livestock-environment interactions, most notably in the areas of the use of fossil fuel in the different production systems, and the social consequences of the ongoing transformation of the livestock sector and associated resource degradation;

- **to conduct** a series of pilot research and development projects in key areas of livestock-environment interactions, most notably in livestock-wildlife integration, livestock-associated deforestation and the establishment of area-wide integration of specialized crop and livestock activities;
- **to develop** specific tools to facilitate decision-making on livestock-environment issues, designed to adapt general principles of improved management of livestock environment interactions to the special regional needs and conditions;
- **to facilitate** the policy dialogue at country level and to provide assistance in policy formulation and incorporating novel concepts at various decision-making levels for the “mainstreaming” of livestock-environment issues within the context of overall economic and social development.

The LEAD Initiative has implemented the project 'Decision Support on Livestock and Environment Issues' to provide decision-support on maximising positive and minimising negative interactions of livestock and environment. The project’s main goals are to increase awareness, knowledge and understanding of livestock and environment interactions; to identify appropriate options for livestock and environment management at regional and national level and to convey livestock and environment concepts to government and donor policies and projects.

A.2 Issues and Options

Livestock production in India, at the moment, has more positive environmental, social and health impacts than negative ones. The production system still is largely predominated by rural based crop livestock integrated smallholder mixed farming systems that are ecologically sustainable. Though large scale industrial production units are on the increase, especially in the case of poultry production, the issues are not very critical at the moment. Still considering the rapid change in the role of livestock in the emerging scenario, these would become critical in the days to come. A few livestock associated environmental issues that are emerging in India are discussed below.

	Livestock Environment Issues in India	Experiences	Other Relevant information
1	Livestock associated degradation of common grazing land	<ul style="list-style-type: none"> • Silvo-pasture intervention in Barawa Village in South Rajasthan • Silvo-pasture intervention in Selu in Rajasthan 	<ul style="list-style-type: none"> • LEI in Watersheds, in India • Preliminary Desk Study On LEI in Watersheds in India
2	Industrial Livestock and poultry production – Environmental impacts	Peri-urban industrial poultry production in Chhattisgarh	Livestock Industrialization, Trade and Social-Health-Environment Issues for the Indian Poultry Sector

3	Livestock, forest interaction	Restoring balance between Livestock, Environment and Livelihood in Cuddappa (Andhra Pradesh)	Rapid Appraisal of Agricultural Knowledge Systems (RAAKS)
4	Livestock based industries and environmental issues	Small village slaughter houses in Kerala	Management of Waste from Animal Product Processing
5	Pastoralism and environmental constraints		
6	Small ruminants and the environment	Ram lambs Rearing - Leveraging Power and Opportunity	
7	Livestock and water productivity	Virtual Water Trade in Dairy Economy	Water Productivity: Estimation at Plot, Farm and Basin Scale
8	Livestock in watersheds		<ul style="list-style-type: none"> • Including Livestock Management in Watershed Development • Including Livestock Management in Watershed Development • LEI in Watersheds: Policy Issues Maharashtra • ANTHRA - NABARD Study • LEAD India Networking Workshop Darewadi
9	Peri-urban Livestock production and environmental issues	Peri-urban dairy colonies (Tabelas) in Mumbai (Maharashtra, India)	Difid - FAO study

B. LEAD Platforms

B.1 Themes and Functionalities

The philosophy behind the LEAD Platforms is that they work together and in conjunction with the Virtual Centre to enable the global community to access information on livestock and environment interactions that is essential to achieve rural sustainable development.

The LEAD Platforms are organized by language and thematic focus. This approach allows the creation of a multilingual network that share the same resources in a central hub but in which each language platform has a particular thematic focus, relevant to their language area. This approach aims at increasing the exchange of information and encourages the users to group around topics closely related to their work and interest.

The platforms group the network members around particular thematic issues by providing information, decision support tools, promotion and dissemination of LEAD activities and networking facilities. The Virtual Centre provides the structure and co-ordination work to facilitate greater interaction among the platform users. This structure encourages researchers to work and correspond with other researchers working in similar agroecological zones and technical fields but who are geographically distant. It also provides the links to researchers and institutions working in the same issues but in a different language.

B.2 The Virtual Centre

To improve communication and enhance the relevance of research and development issues related to livestock - environment interactions, the LEAD Initiative has established a **Virtual Centre** for Research and Development. It promotes multidisciplinary research and development, and increases awareness among key stakeholders of the complex interactions of human needs, animal production and the sustainability of global natural resources.

The functions of the LEAD Virtual Centre are:

- to assist in capacity building and the dissemination of results, baseline information and resource intelligence;
- to support decision-making on livestock environment issues, support mainstreaming of livestock and environment issues in donor operations, and assist in the formulation of national action plans;
- to facilitate international pilot development programmes and assist in carrying out additional studies on livestock environment issues.

The Virtual Centre fulfils these objectives through the LEAD Platforms and the LEAD Research Network.

B.3 Language Platforms

The purpose of the Language Platforms is to connect people and institutions working on livestock and environment issues. The Language Platforms are an extension of LEAD in their own regions and work as networks attached to the Virtual Research and Development Centre. They also act as a hub for field activities such as research, dissemination and support for policy formulation. The existing platforms are supported by regional organisations that carry out research, facilitate feed back and capitalise contributions from field stakeholders.

The LEAD Platforms operate in **English, French, Spanish, Chinese, and Russian**. The main thematic issues or hotspots of livestock and environment interactions covered by them are: wildlife/biodiversity, deforestation, involution of mixed farming systems, pollution from industrial production systems, land degradation and global environmental effects in relation to livestock production. The LEAD India Platform operates in English.

B.4 Popularity

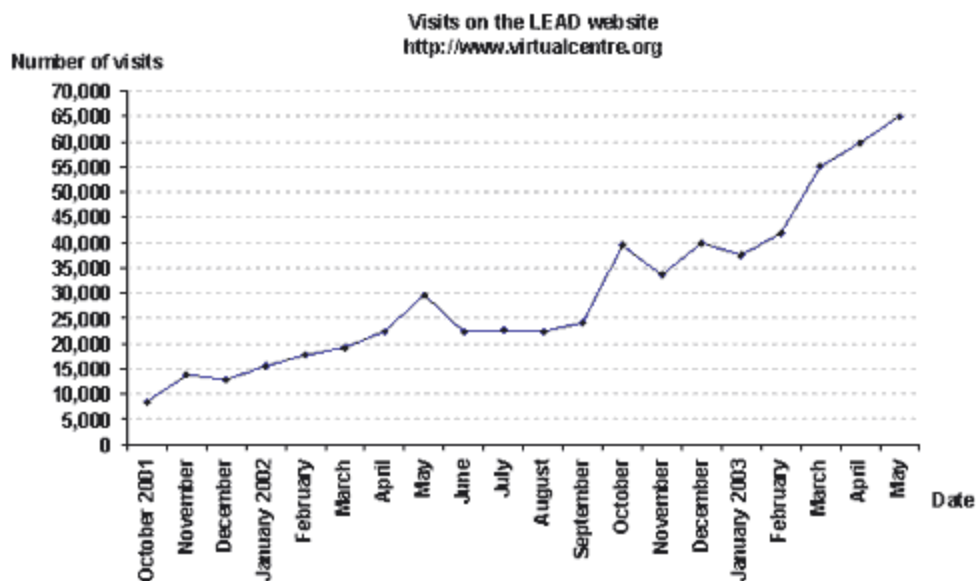
Key Performance Indicators for LEAD Virtual Centre

A study undertaken in 2003 on "FAO's Dissemination and Communication" reviewed the achievements of the information systems since the FAO website was launched, and showed that the LEAD Virtual Centre has established itself as one of the most successful web sites, if not the "single" most successful website in FAO. The study analyzed statistics held by an independent firm "WEBTRENDS" from 1994 till May 2003. Data showed that the LEAD Virtual Centre had more visits than entire Divisions and even whole Departments and it was the most popular web site in FAO.

Even today, a search for "livestock and environment" in the main Internet search engines such as Yahoo, Google, Altavista and Hotbot undoubtedly results in a link to the Virtual Centre as the first option or at least one link among the first 10.

As per the 2003 study, the Centre, operational on <http://www.lead.virtualcentre.org>, had an average of 80,000 visitors per month. This clearly shows that with its experts roster, digital library, institutions database, newsletters and videoconferences, the information provided on the site has been useful and relevant.

Since it was launched in October 2001 the number of visits to the LEAD Virtual Centre had increased from 7,000 to 79,000 in November 2003 (These figures do not take into account visits to the Chinese Language Platform since it is in a different domain in China and direct requests to LEAD documents in FAO Document Repository). Statistics show a number of visits per day of 2,611 with an average length of visit 18 minutes covering 121 countries.



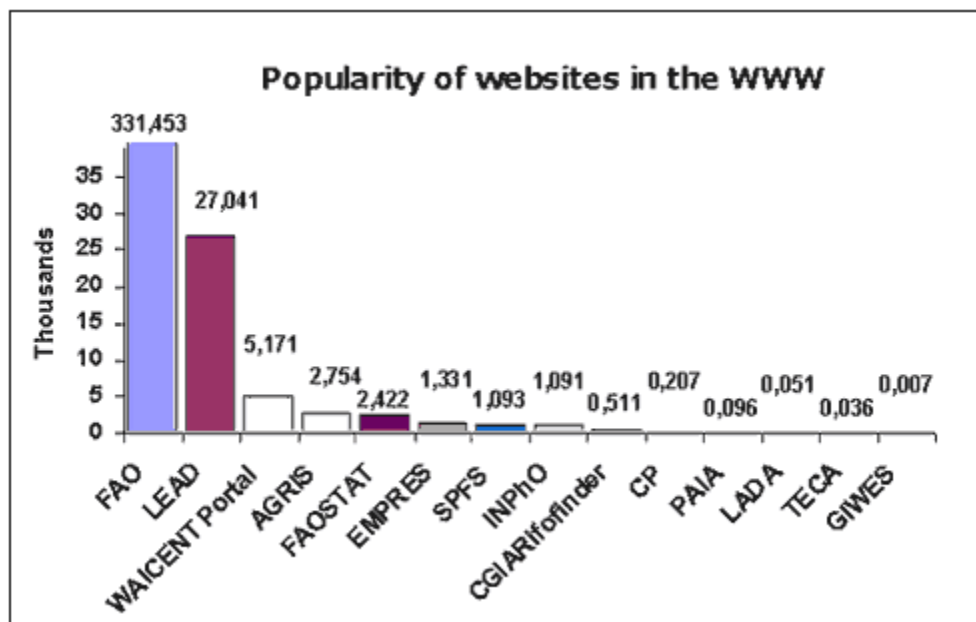
According to the number of visits in May 2003, the LEAD Virtual Centre was ranked fourth, while in November 2003 the LEAD Virtual Centre it was ranked fifth.

Website	Number of Visits
Economic and Social Department	127,949
Animal Production and Health Division	105,767
FAO STATS	92,577
Sustainable Development Department	82,784
LEAD Virtual Centre	78,349
Fisheries Department	65,689
Land and Water Development Division	59,718
CODEX	47,706
Plant Protection Division	40,496
Biotechnology in Food and Agriculture	26,898

The percentage of change found in the study (133% per month) indicates that the LEAD Virtual Centre demand is on the increase. The number of visits per day and the average visit length give a good indication of the quality of the information offered.

HITS	November-2003	Mean 2003
Number of Successful hits on the entire web site	523,277	432,993
Average per day	17,442	14,248
VISITS		
Number of visits	78,349	58,447
Number of visits per day (average)	2,611	1,921
Average visit length (minutes)	17:43:00	
Page Views	155,017	

Website Popularity is determined based on how many times an URL is mentioned or referred to on the World Wide Web – i.e. how many times other sites in the Internet refer, recommend or link to the LEAD Virtual Centre. On this count, too, the study showed that the LEAD Virtual Centre is the most popular FAO web site with 27,000 references. The second best is the World Agricultural Information Centre with only 5,000 references.



The trend continues in 2007 also, with the number of visits, time spent on each visit and website popularity remaining high, (according to feedback from partners) though a further study has not been undertaken recently.

C. LEAD India Platform

The LEAD India Platform is hosted jointly by the Centre for Environment Education (CEE) and the LEAD Advocacy Network (LAN) anchored by Watershed Organisation Trust (WOTR), Maharashtra. The project is supported by the Capitalisation of Livestock Programme Experiences India (CALPI), Swiss Agency for Development and Cooperation Programme and the Intercooperation.

C. 1 Hotspots

1. Shrinkage and degradation of Common Property Resources (CPR) for grazing livestock

The issue

Grazing is the most important source of fodder for both large and small ruminants. Most grazing takes place in forest areas, non-arable lands, along streams, roads, permanent pastures and grazing areas, and land under miscellaneous tree crops and groves. There are several factors that put limitations on accessing the various resources as grazing areas:

- The total area covered by the above categories of land has shrunk by more than 1/3rd post independence in India. The number of watering points (ponds), an important component of grazing lands, has also declined in many states from 55 to 92 percent.
- The proportion of Common Property Resources (CPR) area in villages has declined as a combined consequence of factors at regional, community and household levels; CPRs are also under pressure leading to their degradation and lower biomass potential. The perception and attitude towards CPRs, is more towards establishing private ownership and less on community ownership. The traditional system of collective management and use of CPRs has been broken down in most parts.
- Forest policies have hindered cattle herders in several states as forests are not open to herders in Joint Forest Management (JFM) sites. Several areas have been notified as protected areas and pastoralists are being forced to vacate the same. While formulating state grazing policies and specifically grazing policies in forest regions, there is a lack of involvement of other key stakeholders such as Department of Animal Husbandry, Revenue, Agriculture, Rural Development, local Panchayats, watershed organisations, NGOs, people's institutions, farmer organizations, etc. Sometimes afforestation programmes, watershed development programmes, and soil treatment interventions undertaken in forests limit grazing in the forest area. Conflicts around land-use management and problems with forest management are not being discussed holistically therein and in relation to livestock. Heavy penalties are imposed upon herders leading to forceful giving up of their traditional lifestyle and selling of cattle.
- Afforestation, community forestry and social forestry programmes have focused on developing plantations of non-fodder/non-browsable species, with the explicit objective of enhancing the biomass and forest cover (as an alternative to building social norms for protection).

- During the phase of watershed interventions and afforestation, restrictions and bans are imposed on grazing. If such restrictions are simultaneous, the impact on dependent livestock is disastrous.

Implications

- Environmental consequences tend to become a vicious circle with poor availability of fodder leading to uncontrolled grazing which in turn results in diminished vegetative cover and accelerated degradation through erosion.
- Loss of/ lack of access to grazing land, results in over grazing of the more palatable grass species, which do not have a chance to regenerate and are replaced by hardier and less palatable ones.
- Social fencing and restricted access to fodder resources in watershed development programmes can bring about a ceiling on the number of livestock, especially the small ruminants.
- The access restrictions imposed on common grazing land areas may contribute to a shift to the stall feeding system. However, for the landless and small and marginal farmers this may not be an option in the near future. In addition, women are required to spend extra time collecting and/or cutting and carrying feeding materials for the livestock.
- The rural poor, with limited alternative means of income, depend more on the low pay-off options offered by CPRs. Therefore, degradation and decline of CPR has affected the poor and the landless to a considerable extent, in maintaining the livestock (particularly local – *desi* - cattle and small ruminants) that depend on it; and returns from the livestock have declined in real terms. These households are thus forced to sell away their livelihood assets without any alternative ways of addressing their needs.

What can be done?

- CPRs need to be made more productive in terms of its biomass resources and the people should have a greater stake in developing, protecting and using it. Sustainability of developed areas could be achieved through local informal arrangements, to ensure rotational grazing of different plots by different species of animals, rotational closure of parts of CPRs to grow desired fodder trees (social fencing) to allow some amount of supplementary stall feeding, along with maintaining their carrying capacity. Further, some degree of stall-feeding may be encouraged.
- Create a stronger stake for the communities (including all stakeholder categories like sheep /goat rearers) in the development, management and sustainable utilization of CPRs. Ecological imperatives (supporting CPRs) and sustenance of the rural poor are quite important factors, should not be ignored unless substitute options to CPRs that meet these two concerns are evolved.
- In case there are no alternate options for CPR, endeavour to provide compensatory opportunities for upgrading the production system and/or off-farm employment to the affected families.
- Village Forest Protection Committees are usually formed consisting of members who belong to socially, politically and economically dominant classes; the people who are genuinely dependant on these resources are left out and should therefore

be given a stake in managing and utilizing these resources. Organising the primary groups within the VFPC will democratize these large bodies and give more space for individuals in decision making.

- Continuous support for three years on protection mechanisms commonly agreed and evolved by the communities is necessary. This can be part contribution and part project payment. Such facilitation support should be provided for in the Wasteland Development Projects.
- Multi-stakeholder consultations are important before forming User Groups.
- The role of PRI in Natural Resource Management (NRM) should be made effective (at the moment they see their role in NRM as small).
- Inter-linkages between different government departments, namely Animal Husbandry, Forestry, Revenue, etc. should be strengthened.

2. Pollution from Industrial livestock and poultry production

The Issue

Pollution from industrial livestock and poultry production is going to be a big threat in India in the future, especially in view of the ongoing livestock revolution, which is leading to a growth in the demand for animal protein because of increase in income, population growth and urbanization. This might result in the fast involution of the most sustainable mixed farming system in India, giving way to the industrial production system. Trends reveal that large industrial cattle farms, that are not land based, are increasing, especially in the urban and peri-urban areas. This may lead to environmental (air, water) pollution, mainly because management of cattle manure is difficult (unlike poultry manure) and it easily reaches the water routes. This is a small problem at the moment but may lead to a big problem in due course of time, unless control measures are taken. This is also a problem which can be addressed easily as the cattle owners are big and are able to invest to prevent this potential menace.

The poultry sub sector in India is one of the fastest growing segments of the agricultural sector today. The industry has grown largely due to the initiative of private enterprise, combined with minimal government intervention and considerable support from the complementary veterinary health, poultry feed, poultry equipment, and poultry processing sectors. These poultry units are mainly concentrated around urban and peri-urban areas (because of the existence of ready markets for the end products) and there is no integration with crop production systems. This causes increasing concerns on environmental pollution. It is reported that 250 chickens produce about 135 Kg of Nitrogen and 95 Kg of Phosphorous per year. Farms close to population centres and watercourses are sources of ecological harm and human health issues due to over concentration of nutrients.

The transformation of the poultry sector from a backyard activity into a commercial activity has resulted in the involution of farming systems. This shift has caused the loss of various breeds of country birds (loss of biodiversity) suited to the backyard system with low input and low health risks. This affects the income generation opportunity for farm women, leading to loss of livelihoods, decreasing food security and increasing poverty.

Presence of pesticide and antibiotic residues in livestock products is also a growing problem in India. Since pesticides are sprayed or applied to most crops, they find their way into animals through crop residues. Lack of adequate care in the dosage, precision in application, and such factors lead to high levels of pesticide residues in the stubbles. Similar is the case with rampant use of antibiotics for the treatment of animals. This is a quality and trade issue. As a result of this, Indian livestock products cannot find an entry in the export market because of low food safety quality.

What can be done?

- Enforcement of environmental regulations on controlled use of pesticides, rampant use of antibiotics etc. (in line with polluter pay principle), dis-incentives on urban /peri-urban livestock keeping and incentives for crop - livestock integrated farming system, etc. are possible solutions.
- Technological options comprise development and promotion of indigenous breeds suitable for the backyard system and adoption of manure management techniques.

D. Communication Products and Activities

D.1 Website

D.1.1 LEAD Research

D.1.1.1 LEAD Research India

Watersheds have become recognised as a key and discrete development unit in rural development. To achieve sustainable increase of productivity and management, integrated approaches have been recommended. The intensification and diversification of production is viewed from a livelihood perspective. For sustainable livelihoods, the trade-off between agricultural productivity, equity and sustainability is critical. A preliminary study on Livestock-Environment Interactions in Watersheds in India concluded that the Watershed Development Policy of the Government of India does not include a livestock component. Because of this, livestock is not systematically included in watershed management projects and the socio-economic and environmental importance of livestock is not analysed. The need to fill this void calls for an in depth study of the actual policy framework and recommendations to improve the design and policies of future programmes.

For the LEAD Initiative, one of the critical "hotspots" of the livestock and environment interaction is the watershed and land degradation. To achieve a sustainable livestock production and to encourage stewardship of resources, the people who depend on the land for their livelihood must have a say in, and more responsibility for its management. Measures must also be adopted to improve marketing and drought preparedness and to ensure access rights to grazing and water resources.

Livestock and Environment Interactions in Watersheds in India" is a 24 months applied project being implemented in water-scarce watersheds in semi-arid regions of India. The project is conducting in-depth studies in 5 watersheds to identify and analyse critical issues with regard to livestock, environment and development linkages in water-scarce

watersheds, in order to make a substantial contribution to the improvement of the understanding of livestock – environment interactions and the policy setting to improve the design and implementation of watershed programs.

The site <http://www.virtualcentre.org/watershed> gives more details on the watershed development programme of LEAD.

D.1.1.2 THE LEAD RESEARCH NETWORK

Research for Policy

The LEAD Research Network serves as the hub for information exchange of the LEAD research projects in the field. Acting as a complement to the LEAD Language Platforms, registered researchers can exchange data, documents and links, and have access to shared resources, all through a Web browser. The LEAD Research Network also acts as a forum for scientific debate and provides decision support tools for research, extension and policy formulation.

D.1.1.3 INFORMATION SERVICES

A full range of information services is available in three languages at the Virtual Centre. These include a digital library, an expert roster, institutions database, online discussion fora, expert consultations, electronic conferences and newsletters, databases and maps, reports of pilot projects, study reports and decision support tools for policymakers, researchers, extension workers, universities, non-governmental organizations and farmer organizations.

D.1.2 Decision Support Tools



The Livestock and Environment Toolbox is an electronic decision support tool for policymakers that enables them to assess interactions between livestock production and

the environment. It helps the decision-makers to identify the appropriate technology and policy interventions to mitigate negative effects and to enhance the positive interactions.

Other decision support tools include:

- Fossil Fuel Use Model for Livestock Production Systems
- Livestock Development Planning System
- Nutrient Balance Calculation Program
- Livestock and Environment in the Policy Dialogue
- Global Livestock Densities and Nutrient Balances
- Livestock, Environment and Trade

D.1.3 Resource Persons

Around the globe, there are many people who have experience and expertise in fields relevant to Livestock and Environment issues. The purpose of the “Who's Who” database is to provide a first point of contact with these experts. In order to protect the privacy of the experts, only information about their expertise in LEAD areas is made publicly available. It is possible to contact an expert by sending a message through the Virtual Centre.

The database also has more than 30 experts with country experience in India.

D.1.4 LEAD Library

The LEAD Digital Library is a multilingual reference point for information on Livestock, Environment and Development interactions. Currently a visitor to the site can search for documents in English, French, Spanish and Russian using an English interface. This site contains over **333 publications** (197 in English; 110 in Spanish; 54 in French; 2 in Russian) indexed around six key areas or hotspots which have been identified by LEAD.

Besides these, 15 selected Indian readings have also been added to the digital library; they are:

Title	Author	Publisher
Livestock and Development	N. S. Ramaswamy	CARTMAN Special Issue
Livestock Environment and Development in Watersheds – A Policy Note	R Ranjitha Pushkar, B R Mangurkar, Ravindra A, A K Joseph, V Padmakumar	Madhuri Doss
Livestock based Livelihood and Environment in Saurashtra and Kutch Region	<i>Lead Advocacy Network Project, Gujarat</i>	CEE Ahmedabad
Livestock, Environment and Development – Issues Pertaining to South India		
Sustainable Livelihood through Small Ruminant production	Capitalisation of Livestock Programme Experiences India (CALPI)	
Livestock-Environment Interactions in Watersheds: Policy Issue	WOTR	

Preliminary Desk Study on Livestock-Environment Interactions in Watersheds in India	B. R. Mangurkar, C. Ravikumar	
LEAD India Networking Workshop 25-27 February 2004		
Strategy for Livestock Development in Watershed Interventions	Sagari R. Ramdas	Anthra
Changing Interface between Agriculture and Livestock	Amita Shah	
Project on Livestock Industrialisation, Trade and Social-Health-Environment Impacts in Developing Countries	Christopher L. Delgado, Clare A. Narrod, Marites M. Tiongco	
Impact of Changing Market Forces and Policies on Structural Change in the Livestock Industries of Selected Fast-Growing Developing Countries	Christopher L. Delgado, Clare A. Narrod	
Livestock and Gender: A Winning Pair	Heidi Bravo-Baumann	
Environmental Impact Assessment Vol 1 & Vol V	J. Richard Conner, Wayne T. Hamilton, Urs P. Kreuter, Dennis P. Sheehy, James R. Simpson, Jerry W. Stuth	

D.1.5 Resource Institutions

The links for 19 resource institutions have been provided on the LEAD website for the convenience of interested visitors to the site.

D.1.6 E-discussion

Livestock and Water Productivity

The central role of livestock in natural resource based livelihood strategies, particularly for poor women and men in the rainfed regions of India needs to receive due recognition. Livestock production and consumption in the recent past has been growing at breath taking speed. The dairy industry has seen a major upswing after the inception of the Operation Flood programme. But policies to monitor and mitigate the impact of livestock production on the environment and to regulate the sector have not kept pace.

Milk and meat production, in general, are water intensive activities. Earlier studies reported that it requires an average of about 2750 litres of water to produce one litre of milk. This is inclusive of the water used for direct consumption by the animal and that used for producing livestock feed (grains, irrigated fodder). Secondary data from various sources reflect the growing demand for livestock products (milk and meat) that has led to the rapid growth of intensive production units in urban and peri urban areas with their attendant problems of a large ecological footprint for feed and water, and the impact of waste disposal practices. It is anticipated that the growing demand and market driven

livestock production in the water deficient semi arid region will lead to serious undermining of the resource base.

While crop-livestock integrated mixed farming system can be ecologically sustainable, urban, peri-urban based industrial production system can pose greater human health and food safety issues due to water and air pollution. Due to increased population pressure, the once sustainable grazing /pastoral systems become problematic and overstocking and consequent over grazing causes soil deterioration with reduced water infiltration and retention and soil erosion.

There have been many research programmes on crop-water productivity but few on livestock-water interactions. There are relatively few examples of research that attempt to understand the complexity of integrated crop-livestock-water interactions as a result of which, opportunities have not been realized to maximize returns of water development.

In this context, a month-long E-discussion on **Water Use Efficiency of Livestock Production** was organised from the 10th of Oct to the 9th of Nov 2007, facilitated by Mr Balz Strasser of Helvetas, Switzerland. The discussion saw vigorous participation with several comments, suggestions and experiences being shared. A summary of the discussion prepared by the facilitator, Mr Strasser, is given below.

Summary of the on-line discussion

1 Introduction

The Community of Practice (CoP) on Water for Food (<http://www.water-for-food.ch>) is a network and discussion platform of interested people who wish to capitalize experience, as well as share and create new knowledge and innovations. The CoP on Water for Food is facilitated by Helvetas in the frame of an Intercooperation-implemented Backstopping Mandate on Water for Food financed by the Swiss Agency for Development and Cooperation (SDC), Division Natural Resources and Environment. The main topic of the CoP is "Sustainable use of water resources for food production within the concept of Integrated Water Resource Management in developing and transition countries". Within this main topic there are many sub-topics which are discussed; these are defined by participants themselves, based on their needs and demands.

In October 2007, the CoP has launched a 3-week online discussion on Water and Livestock, inviting participants to contribute to the main topic of "Water use efficiency of livestock production" with a clear focus on livestock keeping in arid and semi-arid areas.

2 Key findings – Overview of discussion

Water use efficiency of livestock production can not be addressed without looking at the livestock keeping households whose livelihood is fully or partly determined by the management of their animals and the respective natural resources such as land and water. Hence, the discussion started with a look at the livelihood and the traditional role of livestock in arid and semi-arid areas.

Threats affecting water availability, water use and in the end the environment and the livelihood of the livestock keepers have been identified; such as expansion of livestock

and crop production into less suitable areas or the promotion/introduction of water intensive production patterns and practices. Depletion of water resources is always also seen as environmental degradation.

As the identified threats somehow reflect the result of trends which set in over the past years, reversing these trends or banning some forms of livestock production from certain areas, however, is impossible or not feasible; even more when looking at the social and political dimension or the driving forces behind livestock production in arid and semi-arid areas.

With regard to water management and environmental aspects in the wider sense, there was agreement that sustainability can be achieved only as long as livestock keeping, but also crop production operate within the limits imposed by hydrology and water balances in the respective agro-climatic areas, thereby putting special emphasis on the sources of water, on the grazing intensity and on closer crop-livestock integration, particularly through the use of crop residues and crop by-products.

3 Water and Livestock – Initiation and 1st round of discussion

The discussion on Water and Livestock was initiated with the following statement: “Water used for livestock production (directly, or via the production of fodder) is becoming a major reason for water shortage for human use in arid/semiarid areas. (Hence,) Is livestock production unsustainable if the use of water resource is included in the valuation process?”

3.1 Livelihood – the traditional integral role of livestock in arid and semi-arid areas

Right from the beginning, livestock production in arid/semi-arid areas was linked to the livelihood of the households keeping animals. It was mentioned that livestock keeping is a traditional and integral activity in many livelihood systems in arid/semi-arid areas in temperate (Groeli, Tibet) as well as warmer tropical and sub-tropical zones (Haile, Ethiopia). Furthermore, the multipurpose role animals in these areas often fulfil was also pointed out (Peden, ILRI). Besides the production of meat and milk, animals provide draft power and manure, with the latter mainly used either as fertilizer or fuel, and their value itself is an asset which can be turned into money in times of needs.

As a matter of fact, most livelihood systems in these areas can simply not be sustained without livestock, and have been environmentally compatible in the past. However, these livelihood systems and with them the animals have in recent years come under increasing pressure due to a depletion of natural resources such as water and vegetation. Reasons for this depletion are population pressure from within these livelihood systems which led to more intensive and/or changed livestock farming patterns with an often unsustainable use of the natural resources, but also changed cropping patterns (Savalia, Gujarat) and expansion of crop land onto land previously used exclusively for livestock (Peden, Ethiopia). Water for households in arid/semi-arid areas may become in future even more critical as a result of climate change.

Hence, talking only about increased productivity and more intensive production and putting water issues into this context without looking at the wider picture of the respective livelihoods falls short of a comprehensive analysis. With regard to livelihood

and the role of livestock linked to it, it was mentioned that “where livestock are the major asset, water development has to take this into account” (Haile, Ethiopia).

3.2 New forms of livestock production in arid/semi-arid areas

Systems are dynamic, and this is also the case for livelihood systems and livestock farming systems in arid/semi-arid areas. As a result of the “economic necessity” to increase output, but also due to population pressure, livestock production has become more intensive in arid/semi-arid areas, and new forms, ways and means of livestock production have been introduced, though with often adverse effects on the environment.

3.2.1 Dairying

One new form mentioned was improved dairying which expanded into semi-arid areas previously seen as unsuitable for intensive dairy activities due to limited availability of water and fodder. It has not only increased milk production with genetically improved dairy breeds (or crossbreds) which requires more water, but also the entire dairy processing industry is water intensive (Ghotge, India). Other contributions illustrated how starting dairy activities in an area where agriculture activities have stopped led to a revitalization of the land, the water table and the entire environment (Uprety, Nepal), but also pointed out how turning to more intensive dairying has changed the livelihood and increased the workload of women (Paudel, Nepal).

Dairying is traditionally practiced in most pastoral communities. They also aim at improving milk production, though their gains might be less spectacular than the ones achieved through sedentary (small-scale) dairy production in semi-arid areas.

When talking about improved, intensive or industrial dairy (or any other agriculture) production, one may recall that improved often means more intensive. However, in most cases, particularly in the agro-climatic zones of arid/semi-arid areas and with the type of production systems prevailing there, improved and hence more intensive systems are still far away from industrial systems; the latter relying heavily on external inputs, often not directly originating from the surrounding areas (Peden; ILRI).

3.2.2 Fodder production under irrigation

Most critical for expansion of livestock production in arid/semi-arid areas is the availability of feed and fodder and of water.

In pastoral systems animals follow fodder sources but can be restricted in their search due to lack of water. Strategies for allowing animals to drink water become important (Peden; ILRI), although simply drilling bore holes (or transporting water in large tankers) and making water available on grazing land can have adverse effects when animals do no longer move and overgraze the land around the water source (Bachmann, Namibia)⁶.

Water used to produce fodder is generally at least 50 times greater than water drunk by livestock (Peden; ILRI). Making the difference between direct (drinking) and indirect (irrigating) use of water with regard to livestock production leads to a key issue: the production of fodder in semi-arid areas under irrigated conditions (Bachmann, general). This is increasingly practiced by dairy farmers, small-scale as well as medium and large farmers on the Indian sub-continent (Ghotge, India; Uprety, Nepal), but also promoted in

small-scale dairy farming schemes in Africa. This practice may become more questionable in places where ground water is used to irrigate the fodder plots.

3.2.3 Expanded mixed crop-livestock farming

Due to the close interactions between crop and livestock production, intensification of crop production also affects livestock production. Where intensified crop production included irrigation, the increased amount of crop residues and crop by-products have been beneficial for livestock production. But if this intensification of cropping was based on the use of ground water for irrigation, it is not correct to blame in the end the animals, although they benefited, for any potential depletion of the water table (Bachmann, general). On the other hand, increased availability of farm yard manure positively affects soil fertility (Savalia, India; Paudel, Nepal; Uprety, Nepal).

Expansion of crop production in semi-arid areas onto land previously used for livestock production is seen as a threat. This type of crop production makes use of an already rather limited source, water, and as long as it does not integrate the animals it pushes livestock out into more vulnerable areas where they may accelerate the depletion of water sources and in general the degradation of the environment (Savalia, India).

Crop production in unsuitable areas might be even more damaging for the environment than if the same area is used for livestock production (Peden, Ethiopia). Hence, one has to assess carefully to which extent water depletion and environmental degradation in semi-arid areas is caused by new crops and cropping patterns and to which extent by livestock production.

3.3 Environmental aspects

Participants were aware about the environmental vulnerability of arid/semi-arid areas, but also noticed that livestock keeping, and other economic activities, are often practised with a lack of sustainability and hence aggravate environmental problems, including the depletion of water resources. “Distributing a scarce resource equitably is rarely a win-win situation” (Morger, general).

There were comments on the use of water for various purposes and in different livestock systems (Timsina, Bhutan) as well as to the more fundamental question on how to quantify the amount of water used directly and indirectly for livestock production (Peden, ILRI).

While there was a rather harsh statement on traditional pastoralism in East Africa (Biru, Ethiopia), it was also voiced that in a number of cases, despite the good intention behind it, planned increases or improvements of production often resulted in the destruction of “well balanced autochthonic systems as well as basic livelihood fundamentals” (Groeli, general).

4 Water and Livestock – Preliminary conclusion and 2nd round of discussion

The question if participants “agree that intensive, industrial livestock/milk production should be kept out of semi-arid and arid areas or completely banned” provoked a wide range of replies. Not only the aspect of banning an activity raised concern, but concerns were also voiced with regard to intensive, industrial production.

4.1 Social and political dimension

Although most CoP participants would subscribe to the idea of keeping water intensive production systems out of arid/semi-arid areas, it is to be noticed that in particular, smallholder livestock production in semi-arid areas, even if it gets improved and more intensive, can not be called industrial (Peden, Ethiopia). Hence, such smallholder livestock initiatives should not be measured against water intensive livestock systems (see also 2.1).

Banning water intensive agricultural activities from water scarce areas is not recommended, because the implementation of such a ban is often not feasible (Savalia, India; Haile, Ethiopia). Or because it is “political suicide” for any government to impose such bans (Morger, general)? Then, as a politician, better do just the opposite and promise farmers free power supply to run their water pumps and get their votes (Celio, IWMI).

It is felt that natural conditions and limited resources may hinder intensive livestock production in semi-arid areas in the long-run, but only after people have exploited and depleted the resources for a short-term benefit. Hence, appraising the environmental compatibility for any expanded or new activity in a vulnerable environment before taking it up is proposed (Groeli, general).

Another suggestion was the provision of incentives by the government or by the society (consumers?) for more integrated, environment friendly production, including environmental services (Padmakumar, general).

4.2 Resource driven versus demand driven location of livestock production

Livestock production, following economic rules like any other activity, is demand driven with the result that production is not necessarily placed in the ecologically most suitable areas (Ghotge, India); especially not as long as nobody feels responsible for negative environmental externalities and is prepared to bear the consequences (Padmakumar, general).

“There is need to ensure that livestock keeping as well as crop production operates within the limits imposed by hydrology and water balances in these arid and semi-arid areas (Peden, ILRI)”. The appraisal of the environmental compatibility (see 3.1) and subsequent enforcement of the results could help moving livestock as well as crop production back to more suitable, resource-specific locations, since “balancing supply and demand is a fundamental principle as far as water management – or in fact management of all natural resources – is concerned (Morger, general)”.

4.3 Criteria and pre-conditions for “water conscious” livestock keeping

Beside the policy level and the market laws, participants felt that there are key issues at the technical and managerial level of livestock production with regard to an efficient use of water. Three issues were identified and brought up for discussion (Peden, ILRI):

- “The source and sustainability of the water used for feed production
- The length of time that animals spend in the arid and semi-arid intensive systems
- The ratio of crop residues and by-products used as feed to the amount of dedicated forage and feed grains used as feed

4.3.1 Source of water

Mentioned already a few times, irrigated fodder production in semi-arid areas using ground water has been identified as a questionable and potentially unsustainable practice. Examples mentioned came in particular from India and Nepal (Ghotge; Bachmann; Paudel). However, groundwater irrigation per se is neither seen as bad nor as unsustainable (Morger, general); “it all depends whether the available recurring water resources can cope with the demand for water.” (Groeli, general).

On the other hand, rainwater harvesting has been successfully promoted in various project initiatives in Ethiopia be it with pastoralists and agro-pastoralists (Haile) or with small-scale dairy producers (Peden; Biru). There were further references to the potential of rain and roof water harvesting (Monta, IRHA; Strasser, Helvetas).

The general statement that “sustainable management and efficient utilization of different sources of water bodies must be taken into account in mixed crop-livestock production systems” (Timsina, Bhutan) can easily be extended to pastoral livestock systems.

4.3.2 Grazing intensity in vulnerable areas

While some see “extensive grazing as a major factor for desertification (Biru, Ethiopia)”, there were other voices pointing out at positive environmental aspects from grazing such as reclamation of dry lands, contribution to bio-diversity, etc. (Padmakumar, India).

Interestingly there were several examples (Peden, Ethiopia; Bachmann; Syria¹⁴; Uprety, Nepal) which showed that a more intensive production where feed and fodder are procured from other sources reduces the pressure on the traditional grazing areas. Grazing time on low productive pastures came down as animals were fed more conserved fodder, crop residues and concentrates.

4.3.3 Role of crop residues and crop by-products

While critical aspects of fodder production under irrigation and grazing in vulnerable areas have briefly been addressed in 3.3.1 and 3.3.2 respectively, the positive contribution of crop residues and crop by-products in the feeding of animals in arid/semi-arid areas is mentioned here. As much as using these feed sources is seen as a viable and feasible option in many systems to improve livestock production and production intensity, they may also ease the pressure of livestock in vulnerable areas as well as the need to produce large amounts of fodder crops whereby the environment, including its water sources is depleted.

Examples are cited from Sudan (Peden)¹⁵, but crop residues and by-products also play an important role on the Indian sub-continent, as well as in West Asia (Bachmann, Syria).

With regard to water, one has to take into account under which conditions the crops are grown whose residues and by-products afterwards are used for feed. Are these crops grown under rainfed condition? Or have they been irrigated with surface water or with ground water? In the latter case, however, one may also put a question mark to the crop production system. Changes in cropping patterns may also result in a loss of feed if the new crops yield less or no longer any residues and by-products for the animals (Savalia, India).

5 Conclusions and gains

Livestock keeping in arid/semi-arid areas can per se not be blamed for the depletion of the water resources in these areas, but there are questionable practices affecting water sources and their use such as fodder production under irrigation in semi-arid areas, overgrazing in vulnerable areas, non-location specific production and processing (dairying) of livestock produce, intensive or even industrial production.

The insight gained may support the search for recommendations such as:

- Look out for environmentally sound livestock production (environmental compatibility); with regard to water for livestock, search for water sources other than ground water where there is a high risk of overexploiting this water source
- Improve efficiency of livestock production through a more efficient use of a limited resource such as water (but also grazing land) to avoid further depletion of water (and pasture land) resources, but to save water and perhaps even improve water (and pasture) resources
- Use crop residues and by-products as feed resources, thereby reducing pressure on grazing land and unsustainable fodder cultivation and increasing the efficiency of mixed crop-livestock farming systems
- Take into account the livelihood of livestock keepers and put traditional and improved animal husbandry practices into the respective context
- Work with incentives rather than bans and exclusions when it comes to a sustainable management of natural resources, including water
- Acknowledge the important overall positive role of livestock in arid/semi-arid areas, despite the current threats from livestock management with regard to natural resource management

D.1.7 E-Newsletter

The first issue of the *Livestock – Environment Newsletter* has been published in March 2007. Three issues per year are planned. The newsletter attempts to address livestock related environmental issues in India and is a platform to share and compare similarities and diversities in issues as well as approaches in addressing them.

D.1.8 Share your knowledge

LEAD India is a platform to facilitate sharing of experience and information on livestock-environment interaction and its impact on the livelihood of the poor. This link invites interested people to contribute and share information, relevant experience or any kind of resource on livestock - environment interaction that would benefit other readers on this site. To make the submission process easy, ready formats are provided here.

D.1.9 News

News items related to LEAD are periodically being included in this section of the website.

D.1.10 Events

The following events related to LEAD issues are showcased on the website.

Role of Livestock in Sustainable Development – A LEAD South-South Consultation

24 November 2007 / 28 November 2007

India, Asia, Centre for Environment Education, Ahmedabad (www.envirodebate.org)

Water Interaction, Livestock – Land and Forest Interaction, Livestock & Climate change, Intensive Livestock Production Systems, Biodiversity, Water

INTERNATIONAL CONFERENCE ON ENVIRONMENTAL EDUCATION

(DESD)

24 November 2007 / 28 November 2007

India, Asia, Centre for Environment Education, Ahmedabad (www.envirodebate.org)

Livestock- Formal Education- Pedagogy, Values and Ethics, Formal Education- Teacher Training, Community Leadership, Open and Distance Learning (ODL), Meeting Challenges of Knowledge Management in Water and Sanitation, Higher Education Sustainable Livelihoods, Regional Centres of Expertise (RCEs) , etc.

Restoring Balance between Livestock-based livelihood and Natural Resources

19 July 2007 / 20 July 2007

India, Asia, Centre for People's Forestry

Training on “Environmental impact assessment for planning ecologically sustainable livestock production”

23 April 2007 / 27 April 2007

India, Asia, CALPI

Inspiring Change in the Livestock Sector - People to Policies

2 April 2007 / 3 April 2007

India, Asia, Intercooperation

Workshop on “Pastoralist: Present and Future

15 March 2007 / 16 March 2007

India, Asia, Centre for Environment Education and MARAG

Livestock in a Changing Landscape - An Integrated Analysis and Global Consultation

27 November 2006 / 1 December 2006

India, Asia, FAO, LEAD, SHL, CIAP/SCOPE, CIRAD and ILRI

Third Learning Event as part of the Capitalization of Experiences in Water, Land and People

22 November 2006 / 24 November 2006

India, Asia, Inter Cooperation

Fifth Conference of the Asian Federation for Information Technology in Agriculture (AFITA) - 2006

9 November 2006 / 11 November 2006

India, Asia, Indian Society of Agricultural Information Technology (INSAIT)

Reorienting Agricultural Research to meet the Millennium Development Goals

9 November 2006 / 11 November 2006

India, Asia, Global Forum on Agricultural Research

International Livestock & Dairy Expo

27 August 2006 / 29 August 2006

India, Asia, Pixie Publication India Private Limited

State Level Workshop-Karnataka on:Strengthening Livestock component in Watershed programs:Concerns and Options

7 June 2006 / 8 June 2006

India, Asia, SAMUHA, Bangalore

Building Strategies and Perspectives on Livestock Rearing in Dry land Agricultural Context

15 May 2006 / 20 May 2006

India, Asia, ANTHRA, Pune

Mainstreaming Livestock and Watershed Development: Beyond Concerns and Rhetoric

10 May 2006 / 11 May 2006

India, Asia, Watershed Organisation Trust (WOTR)

LEAD WRITE workshop – Documenting Field level Experiences

3 May 2006 / 4 May 2006

India, Asia, Centre for Environment Education, Media for Sustainable Development

LAN –Gujarat - State Level Workshop

2 May 2006 / 2 May 2006

India, Asia, Centre for Environment Education

Animal welfare

30 April 2006 / 13 May 2006

India, Asia, Karuna Animal Welfare Association, Karnataka

CALPI – FAO workshop on “Benefit sharing mechanisms for production of Environmental Services”

23 January 2006 / 25 January 2006

India, Asia, CALPI

One-day workshop on Korangadu Pastureland (Traditional Dryland Silviculture System)

10 December 2005 / 10 December 2005

India, Asia, SEVA

Dadri Mela

1 November 2005 / 30 December 2005

India, Asia,

National Workshop on “Emerging policy issues under watershed development programme”

5 May 2005 / 7 May 2005

India, Asia,

Venue: Best Western RESORT Country Club, Pachgaon-Tauru Road, Gurgaon (40 Km from Delhi Airport on the Jaipur highway, near Manesar, New Delhi)

Policy Roundtable on "Livestock - Environment Interactions In Watersheds: Policy Issues -

11 January 2005 / 11 January 2005

India, Asia, Watershed Organisation Trust (WOTR) and International Water Management Institute (IWMI), Hyderabad

Venue: Hotel President, Pune, Maharashtra [[...more](#)]

D.1.11 Payment for Environmental Services

Payment for Environmental Services (PES) are flexible and direct payment mechanisms by which environmental service providers are paid for the environmental services they produce. Generally, improved water quality and availability, carbon sequestration and biodiversity conservation are the services considered for payment. PES have the potential to be a successful tool for ecosystems improvement and the reduction of land degradation processes, as they can be used to facilitate the shift to land use options which are favourable to the environment. While the payment for these services are meant to act as incentive to tip the balance for adopting sustainable practices, other goods /services generated through change in the land use system such as enhanced water access and quality, increased availability of fodder and fuel wood, improved land and animal productivity etc. provide direct benefit to the local community.

Payments for environmental services have usually focused on privately rather than communally owned lands. Nevertheless communal lands and associated ecosystems are in many parts of the world under great threats. The development of tools and policy for the use of payments of environmental services targeted to communities rather than individuals is one option to preserve the fundamental function of these ecosystems of global significance.

Successfully implemented in several countries, two PES projects are being developed to be implemented at the community level in arid and semi-arid watersheds in India. The projects are in the two states of Karnataka and Rajasthan.

The PES link provides information / reports on projects, programmes and policies that address the issue of payment for environmental services.

D.1.12 Photogallery

The purpose of the Photo Gallery is to illustrate the LEAD interactions across the globe and is available on a wide range of related topics. The photographs are classified and available to download with an average resolution (maximum length of 600 pixels) in



JPEG format. The original photographs can also be obtained at a better resolution by specifying the reference of the photograph and the intended use through a mail sent to the contact email id. Photographers from around the world whose work focuses on livestock and environment issues are also welcome to contribute photographs for this section.

D.1.13 LEAD Hotspots (Global)

Increased attention to livestock-environment interactions is of critical importance in sustaining the world's resource base. Finding the balance between increased food production and the preservation of the world's natural resources remains a major challenge. The location or activity where livestock interaction with the environment is considered adverse to the sustainability of an ecosystem or human activities relying on it, is defined as a hotspot. Focusing on the livestock-associated environmental problems, some LEAD Global Livestock and Environment Hotspots stand out: Wildlife/Biodiversity, Deforestation, Involvement of farming systems, Industrial pollution, Global environmental effects, Land degradation. -

Wildlife/Biodiversity

Particularly in Africa and Central Asia, livestock often share grazing lands and habitat with wild ungulates and other large mammals. Although the people in such areas have had to absorb the damage caused by wild animals through disease transmission, predator losses and crop destruction, they have, generally, not shared in the benefits reaped from wildlife conservation through tourism or trophy hunting.


What can be done?

There is growing recognition that, if carefully managed, harmonious co-existence between wildlife and livestock is possible. In some areas, local management of wildlife, in combination with livestock production, is already increasing the income of pastoralists and ranchers as well as biodiversity. Most livestock-wildlife combinations require a reduction of 20 percent of the cattle stocking rate in order to create a niche for most wildlife species to prosper. This is a classic example of how both livestock owners and the environment can benefit.

In collaboration with the African Wildlife Foundation, the Centre de Coopération Internationale en Recherche Agronomique pour le Développement and the International Livestock Research Institute, LEAD is guiding an initiative in Sub-Saharan Africa with that aims to develop further strategies to profitably integrate livestock production and wildlife in communal lands adjacent to protected areas.

Deforestation

Since 1950, more than 200 million hectares of rainforest have been lost. In many cases, livestock have been indicated as an important reason for these developments, especially in Latin America. In the past, deforestation was often encouraged by land registration and ownership policies, credit and tax breaks that favoured ranch development and land speculation schemes. Many of these inappropriate incentives have now been removed. The main causes now are the demand for food of a growing population and, possibly the



financial attraction of ranching when soil fertility has been depleted by crop production following logging.

What can be done?

Land use intensification, through a combination of fiscal incentives and the introduction of economically viable technologies will be a main strategy for the rehabilitation of degraded areas and the slowing down of deforestation.

LEAD has developed a project with the Centro Agronómico Tropical de Investigación y Enseñanza (CATIE), the Nitlapan Institute for Research and Development of the University of Central America (Nicaragua) and the Centre for Research on Sustainable Agricultural Production Systems (Colombia) that rehabilitates degraded pastures through the development of more intensive silvopastoral systems thus providing local social and economic benefits as well as global environmental gain through carbon sequestration and the conservation of biodiversity.

Involution of farming systems

Most farming in the world is carried out in mixed crop-livestock systems that cover about 2.5 billion hectares of land. Historically, mixed crop-livestock systems have been the basis for agricultural intensification and increased production. In these systems, livestock not only provide farmers with the capacity to convert plant biomass into high value foods, draught power and a form of asset accumulation, but they also provide a mechanism to import and concentrate nutrients, which is key to the sustainability and intensification of these smallholder farming systems. Mixed farming offers the best opportunity for intensifying agricultural production without causing environmental harm. Less often recognized are the benefits to biodiversity of more varied land use in crop - livestock systems. Fodder trees, grass strips and other landscape features provide a diversity of habitats for many kinds of wildlife including micro-fauna and flora.

The closer integration of crops and livestock in smallholder farming systems has been widely advocated as an appropriate means to improve their sustainability. As each generation needs land, however, farm sizes reduce until a point is reached when the system collapses. Livestock, often large-ruminants, can no longer be maintained on the farm, thus depriving the farming household of draught power and the soil of available nutrients. Furthermore, as natural resources become ever more degraded and poverty increases, human tensions develop.

What can be done?

In these systems progress can be made by increasing access to outside inputs, such as animal feed and fertilizer, to maintain the nutrient balance. The integration of crop and livestock can be encouraged with the removal of subsidies on feed, fertilizer and mechanization as this would result in better use of homegrown feed, animal draught and manure. Even in developed countries, where mixed farming is more intensive and therefore more likely to be suffering from a surplus than a shortage of nutrients, removal of subsidies on feed and fertilizer would help to reduce damage to the environment.

Industrial pollution

Industrial production of pork, poultry, beef and mutton is growing faster than any other livestock production system. More than half the world's pork and poultry, one-tenth of its beef and mutton and more than two-thirds of its egg supply currently come from industrial production. Developed nations dominate the intensive pig and poultry industries, but in recent years there has been a trend towards more large-scale, industrial production units in developing countries as well.

Industrial production brings in large quantities of nutrients in the form of concentrate feed. This can create serious land and groundwater pollution problems because the resultant manure is often disposed of on nearby land. Key forces encouraging this trend are subsidized concentrate feed, poor infrastructure and weak regulations. Where roads are inadequate and transport costs high, industrial units are usually located close to urban centres. This has happened in Asia, for example, where industrial livestock production has developed very quickly and where a weak regulatory structure compounds the risks to human health, especially those associated with inadequately regulated slaughterhouses and other processing industries.

What can be done?

Improvements in transport will make it possible to return nutrients to the land from which they were taken. It is likely that economic realities will force livestock production to specialize in order to make use of efficient technologies. However, urban livestock production systems, which are mushrooming in fast developing nations, will not be sustainable in the long run, and livestock production needs to be brought back to rural areas. Institutional and infrastructure development, together with a higher appreciation of environmental values vis-à-vis food commodities, will mean that agriculture in the future will look like a large mixed farm composed of specialized enterprises.

In collaboration with the Research Centre for Rural Economy (China); Department of Livestock Development and the Faculty of Agriculture of Kasetsart University (Thailand); the University of Agriculture and Forestry (Vietnam); the Universidad Nacional Autónoma de México and the Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias (Mexico); LEAD is coordinating a number of initiatives in East and Southeast Asia and Latin America. These initiatives are evaluating different technologies and policy options, based on the "polluter pays, provider gets" principle, to integrate crop and livestock activities in an area-wide context to correct nutrient balances without jeopardizing efficient production.

Global environmental effects

Greenhouse gases: livestock and livestock waste produce gases. Some are local, such as ammonia, whereas others, such as carbon-dioxide, methane and nitrous oxides, affect the world's atmosphere by contributing to global warming. Livestock's contribution to that effect can be estimated at between 5 and 10 percent.



What can be done?

Limiting the emission of greenhouse gases, particularly nitrous oxides and methane, is a major concern but technical solutions are available. For example, methane can be recovered from lagoons and used directly as fuel or to generate electricity. The trend to intensive production of pigs and poultry has changed the ration of monogastrics to ruminants. This has helped to keep livestock emissions of greenhouse gases steady because unlike ruminants, pigs and poultry do not emit significant amounts of methane as part of the digestion as ruminants do. Virtually all efforts that improve animal productivity will reduce methane emissions. Thus, livestock, emissions are stagnating despite a strong overall increase in production. The challenge will be to ensure that the rapid expansion of intensive production in developing countries does not result in damaging pollution. As the West has found to its cost, once present this is very difficult to deal with.

LEAD is working with the US Environment Protection Agency, the Colorado State University and the Tropical Agricultural Research and Higher Education Center (CATIE) in order to develop simple, interactive computer-based systems to support greenhouse gases mitigation policy decisions related to mixed agricultural and livestock systems.

Land degradation

For an estimated 200 million people, grazing livestock are the only possible source of livelihood. Grazing livestock allow the conversion of low quality biomass into high quality products and the exploitation of common-property resources for private gain. Rangelands are dynamic and highly resilient, provided that the number of people and animals that the land supports remains in balance with the environment.

Many of the world's grazing areas are threatened with degradation, especially in the semi-arid and sub-humid zones. Increased population pressure and policies introduced for social or economic reasons that favour cropping, but whose environmental impact has either been ignored or not recognized, has led to much of the best pasture being turned over to crops. Not only is the available grazing area reduced by this, but it also restricts animal movement between grazing lands, an essential strategy used by pastoralists to optimize resource use. Lack of ownership rights to grazing lands often prevents individual investments in land improvement. This has been exacerbated by the replacement of customary land use practices by 'free for all' access. What was once sustainable balance between livestock and the environment has been seriously disturbed.

What can be done?

To encourage stewardship of resources, the people that depend on the land for their livelihood must have a say in, and more responsibility for, its management. In order to have a significant impact, and to stimulate a quicker turn-over of animals, measures must also be adopted that: improve marketing and institutions for drought preparedness, establish realistic prices for grazing rights, water and livestock services; and, where appropriate, ensure rights to grazing and water resources.



LEAD is actively testing such concepts in a number of dryland areas of sub-Saharan Africa and South Asia in collaboration with the Centre de Coopération Internationale en Recherche Agronomique pour le Développement, The Centre de Suivi Ecologique and the Institut Senegalais de Recherches Agricoles.

D.1.14 LEAD Research (Global)

Research and Development on Livestock and Environment issues is facilitated through guidance on project identification and implementation, and assistance with dissemination and scaling up of findings. The projects are implemented by partner's institutions under the overall framework of LEAD and research and development is facilitated by regional language platforms supported by the LEAD Virtual Research & Development Centre.

The Russian Language Platform has no projects started in the region yet due to the funding issues. However, the active discussions on hotspots with partners from CIS countries and Mongolia has been started during the initial stage of the platform development and continued at the current stage. Presently, there are few pilot projects proposed by partner's institutions have been taken under consideration by interested donors. The platform is planning to conduct a workshop with donors and institutions in the nearest future.

Globally LEAD is engaged in the following projects under three research and development programmes:

Programme: Improved-decision making in addressing livestock's role in dryland management

Piloting Livestock and Wildlife Integration in Communal Lands Adjacent to Protected Areas in Africa: Identifies land-use planning and cost and benefit sharing mechanisms to improve integration of livestock, wildlife and crops on communal land, reducing conflicts and improving the livelihoods of livestock farmers. Countries: Chad and United Republic of Tanzania.

Decision Support to Livestock and Environment Policy Issues in Watershed Development: Identifies better targeted institutional, socio-economic and technological interventions for the livestock component in watershed development. Country: India.

Pastoral Systems and Land Degradation in West Africa: Reduces land degradation and erosion of biodiversity in the Sahel, leading to the inclusion of livestock environment interactions in the livestock policies. Countries: Burkina Faso, Cape Verde, Chad, the Gambia, Guinea Bissau, Mali, Mauritania, the Niger, Senegal (CILSS area).

Increasing water-use efficiency for food production through better livestock management: This project has been proposed by ILRI as a component of the Challenge Program on Water and Food. It sets out to improve food security, reduce poverty and enhance agro-ecosystem health by managing livestock more effective overall use of water resources in the Nile basin. It addresses livestock-water interactions in rain fed pastoral, rain fed mixed crop-livestock, peri-urban and large scale irrigation systems all of which are important priorities in the basin.

Programme: Improved decision-making in addressing livestock's role in the deforestation process

Integrated Silvopastoral Approaches to Ecosystem Management: Aims to improve and develop sustainable management systems for degraded pastures in Latin America, thus reducing pressure on tropical rain forests. Countries: Colombia, Costa Rica and Nicaragua.

Programme: Improved decision-making in addressing land, water and air pollution by industrial livestock production

Waste Management of Intensive Livestock Production: Identifies policies, institutions and investments to achieve better spatial distribution of intensive livestock production units and to mitigate negative externalities of livestock production. Countries: China, Mexico, Thailand and Viet Nam.

Ongoing Industrialization of the Livestock Sector in the Periurban Areas of Developing Countries and its Effects on the Poor and the Environment: Examines livestock sector trends and production costs as well as social, environmental and consumer and animal welfare impacts of different scales and types of production on the livelihoods of livestock-dependent people. Countries: Brazil, India, the Philippines and Thailand.

Impacts of Social, Health, Environmental and Trade Objectives on Domestic Policies and Market Forces Shaping the Livelihoods of Livestock-Dependent People in Developing Countries: Assesses the degree to which greater concern for social, health and environmental objectives has influenced domestic policy and corporate activity. Countries: Brazil, India, the Philippines and Thailand.

For more information about existing projects from other platforms experts can visit websites of English, French, Spanish or Chinese platforms where projects are presented in the relevant languages.

D.1.15 LEAD Decision Support Tools (Global)

The global livestock sector is undergoing dramatic changes. Fuelled by a growing population, rising income and growing urbanisation, demand for livestock products in the developing world is expected to double over the next two decades. Increased production in any enterprise is likely to have negative consequences for the environment, unless steps are taken to ensure that the natural resource base (land, vegetation, water, air and biodiversity) can be sustained while still increasing food production.

Present systems of livestock production have both positive (e.g. enhancing soil fertility through application of manure) and negative (e.g. pollution of water courses through improper disposal of effluent from processing plants) consequences for the environment, at local, regional and international levels. This toolbox has been designed to help those less familiar with these interactions to identify which ones should be enhanced (positive) or mitigated (negative) and how to achieve those goals.

The 'tools' provided are technical and policy or institutional development options for enhancing positive or mitigating negative effects of livestock on the natural resource base, together with suggestions for increasing awareness of the issues among a spectrum of policy-makers, planners and extension officers.

The Toolbox manual describes how to use the toolbox and includes a structural diagram of the toolbox components, which can also be accessed from any page, using the green "Toolbox Outline" link. Key references (texts describing the background and specific issues in more detail), definitions (of specialist terminology) and abbreviations can also be accessed from relevant pages.

The toolbox consists of pages of information on livestock production systems and the way in which they interact with the environment. Access to these pages has been structured such that the reader can use the information, either (a) to evaluate the impact of existing livestock systems on the environment, or (b) to identify appropriate technology, policy and/or institutional management options, to alter the way in which livestock affect the environment under a given set of conditions.

<http://www.virtualcentre.org/in/dec/toolbox/Index.htm>

D.2 Non-electronic Communication Products and Activities

D.2.1 Newsletter

It is planned to bring out three issues per year of the LEAD Newsletter called the “*Livestock Environment News*”. Till date one issue has been published, and the second one is ready for publication. Print copies are also being considered, besides the electronic version. The newsletter provides updates on the most recently organised and scheduled LEAD events, news, articles, space for readers to share their experience, besides brief write-ups on the features of the website.

D.2.2 Write Workshops

One of the most inclusive activities of LEAD, these workshops enables people working at the grass root level with livestock and related issues share their experiences, learnings and innovations. During 2006-2007 two Write Workshops have been organised, one in Ahmedabad, Gujarat and the other in Bangalore, Karnataka. As a result of these workshops, about 20 case studies in Gujarati and 13 in Kannada have been compiled from the participants, which are in the process of being translated. These will be published and made available on the website.

D.2.3 Video conference

A video conference was organised on the 30th of May, 2006 on the topic “***Small Ruminants: A Potential Overlooked***” with two sub-topics

- 1) *Small ruminants - are they really a sustainable livelihood option for the poor?*
- 2) *Pastoralism and small ruminants are a threat to the environment.*

A brief overview of the issues discussed in the videoconference is given below.

Small ruminant production as a sustainable livelihood option for the poor

Statistics show there is a steady increase in goat population, milk and meat production. The hike in meat prices show there is a demand for meat. Renewed interest in organic farming has opened the possibility for the pastoral community to develop sustainably. Although all groups expressed a view that small ruminant production is an option for sustainable development, Dr Srinivasa Rao, Dept. of Animal Husbandry, Hyderabad expressed a varied view that small ruminant production is a sustainable option only for traditional rearers and not for those who take it up as a new livelihood option.

The case of a village in Karnataka that depends mainly on livestock for its livelihood was also discussed. There are 280 families living in this village with 1180 cattle. In this village, the community organisation has balanced small ruminant production and environment management. These villagers converted private fallow land to grazing land.

Market based issues

Milk industry does not focus on small ruminants. Workshop findings in Maharashtra show that small ruminant rearers are mostly interested in meat and dairy. As there is no demand for coarse wool in central and south India, farmers are not interested in wool breeds and are shifting towards meat breeds like *Osmanabadi* and *Mudgyars* from Deccan. In Maharashtra, farmers are benefited by the meat market as there are no middle men involved. In Karnataka, there is a large variation in the money paid by the consumer and that realized by the producer. This trend is mostly observed in villages and the

producer gets less than 50%. The true value of small ruminant production can be achieved if a substantial proportion of the consumer rupee reaches the farmer. In Rajasthan, there is a need to study the market pattern. Goat milk is medicinal and is used in poor and marginal households of Maharashtra, Gujarat and Rajasthan.

Indigenous Knowledge

In Karnataka, shepherds are from the poor community and they lack knowledge about rearing practices and the technologies that are evolving. Lalji Desai of Gujarat responded and said that the pastoral community has indigenous knowledge to treat health problems and breeding practices. Sudhakar Yadav responded saying that knowledge on small ruminants should be seen from the shepherds' perspective. Dr. Ravi Kumar of Karnataka said that shepherds in Karnataka lack knowledge and there is a need for extensive education. Studies on indigenous pastoral communities have to be carried out.

Issues of Pastoralists

Earlier, agriculture and pastoralism were interdependent. Pastoralists had conventional rights on agricultural land in their village. Now with the changing cropping pattern, fodder is reduced. Studies in Karnataka show that trees, herbs and shrubs grown in different patterns in a grazing land can provide feed to both sheep and goat. The adverse impact on the environment due to small ruminants is a consequence and not a cause. In Karnataka, a study has been carried out using mulberry leaves, as these leaves are rich in protein content and are a good fodder resource. A study carried out in Karnataka using roughage and concentrate helped solve the problem of feed shortage.

Earlier shepherds were invited to the fields by the villagers where they migrated as this is a mutually beneficial process. The shepherds had a right on the agricultural land where they migrated. Common Property Resources (CPR) are lands which the livestock of a village shares. With the use of these lands for other purposes like watershed management small ruminants are not allowed to feed there.

Policy related issues

There is a lack of knowledge among small ruminant rearers about the resources available to them. Watershed and Joint Forest Management (JFM) projects have reduced land accessibility to small ruminants. Small ruminant rearers have little access to institutional credit and insurance. The Hyderabad team expressed a view that, though small ruminants contribute to the gross domestic product, these animals are given least priority. Sudhakar Yadav, a practitioner from Andhra Pradesh expressed his view that policy makers are not giving the same priority to small ruminants as is given to poultry. All the groups agreed with the view that small ruminant rearers should be recognized as part of village committees.

Health and veterinary aspects

All the groups accepted that shepherds have traditional knowledge to diagnose diseases that are common to small ruminants. There are many diseases prevalent since long but no efforts have been taken to develop vaccines for them. Recent statistics show that every year small ruminants are affected by diseases like blue tongue and PBR. According to Sudhakar Yadav, about ten lakh animals died due to blue tongue. This shows there is an urgent need to develop vaccines. Lamb mortality rate is high in Andhra Pradesh as observed by Dr. Vishwa Raj, Retd. Director, Animal Husbandry. The Karnataka team

carried out a study by using herbal dewarmer one week before giving birth. The Karnataka team also mentioned about a practice where herbal medicines are used to treat some disorders. There are inadequate veterinary services for small ruminants. A mobile veterinary system has to be developed to rectify this. Information has to be provided to readers on the identification, diagnosis and prevention of a disease.

Breeding Practices

There is a lack of information on the variety of breeds available. There were no studies on local breeds which survived the conditions of draught and disease. There are no studies on genetic improvement of small ruminants. In Maharashtra, as there is a demand for meat, *Osmanabadi*, a goat breed and *Mudgyars*, a sheep breed are reared for this purpose. *Mudgyars* replaced the wool breed *Deccani* as there is no demand for their wool, but, *Deccani* breed survived the adverse conditions of the region. Studies need to be carried out on developing breeds that can survive challenges.

D.2.4 Trainings

A course on “Environmental impact assessment for planning ecologically sustainable livestock production” was organised by CALPI and LEAD Platform in India led by Watershed Organisation Trust (WOTR). It was held at the Centre for Environment Education in Ahmedabad (India), from April 23-27, 2007. The programme was facilitated by Dr. Hans Schiere, Consultant and Trainer on livestock environment interactions from the Netherlands.

The participants came from different sectors and levels of society, as well as from different disciplines. The course consisted of three layers, assuming basic knowledge and skills regarding animal keeping, forestry, sociology, rural development, participatory approaches, etc. The three layers are respectively:

- a ‘cafeteria’ layer with novel topics on issues that are relevant in modern livestock environment areas
- a ‘system analysis and design’ layer, to allow participants to get a grasp of their own situation
- a layer with study groups, in which participants can address issues of their own concern, and in which they share experiences and design new approaches with the help of colleagues on similar topics

Such a layered approach allowed for the presentation of a mix of theoretical and practical tools for system analysis and design with much interdisciplinary exchange. A series of optional subjects, such as urban agriculture, mixed farming, organic and fair-trade, social- and gender issues, soil fertility and livestock, use of crop residues, paradigms and research approaches, recycling, terminology like mixed, rain-fed, context and policy frameworks were offered to enhance the effectiveness to the course.

Some of the goals of the study group were to actively apply the new skills and information, to move from analysis towards design, to allow participants to interact with colleagues on specific but shared interest and to shift from technology to demand-driven approaches. Participants decided on their own choice of topics for the study groups – fodder, small ruminants, attitude, livestock / livelihood, breed improvement and improved livestock management.

Short term results included issues such as motivation, new insights, better grasp of system analysis and design. In the long term the learnings are expected to lead to changed approaches and application of ideas and methodologies in professional practice.

D.2.5 Workshops

Role of Education in Addressing Livestock, Environment and Development (LEAD) Issues

As part of the 4th International Conference on Environmental Education held in Ahmedabad during November 24-29, 2007, LEAD India organized a workshop on the 'Role of Education in Addressing LEAD Issues'. The workshop held on November 25 & 26, attracted more than 30 participants from various sectors, and covered the following sub-themes:

- Livestock – Land Issues
- Livestock – Forest Issues
- Livestock – Water Issues
- Livestock – Biodiversity Issues
- Intensive Livestock Production

The session started off with an introduction to the workshop by Dr. Mohanan, followed by a presentation by Amare Hailelassie of the International Livestock Research Institute, Ethiopia, on Livestock and Water Interaction. Mr. Shailendra Tiwari of Seva Mandir; Shri Shivashankar Reddy, Principal Chief Conservator of Forests, Andhra Pradesh; Dr. C. T. Chacko, Dr. M. Osman, Mr. Padmakumar of CALPI were some of the speakers and panelists. The discussion following the presentations brought out many local issues on livestock like pressure on water from livestock and human beings, grazing, forest rights, livestock productivity, biodiversity, and the Tribal Bill were discussed from the point of view of policy as well as market mechanisms. Incentives for increasing biodiversity in livestock, managed grazing and its beneficial effect, fodder policy, budget allocation were some of the other issues discussed. Some of the speakers discussed the issues of pressure on natural resources in the context of increasing livestock population and limited natural resources. There was a lively discussion with many interventions from participants and panelists.

D.2.6 Promotional Events

These events are aimed to inform, educate and update academicians, researchers and students of the under-graduate and higher levels about current and emerging LEAD issues and the interrelationships among them. During such events, LEAD publications are also distributed. Two such promotional events were conducted at Udaipur, Rajasthan (November 30, 2007) and Thiruvananthapuram, Kerala (December 18, 2007).

At Udaipur, the audience comprised of faculty members and undergraduate students of the host institution Maharana Pratap University of Agriculture and Technology, resource persons from Seva Mandir, an organisation working on institutionalising people's participation in development and governance and a representative from the KSD team. The topics covered were: Livestock – Livelihood – ***Environment Interaction, Policy***

Contexts and Challenges, The Case of Kalyanpur Watershed and Agriculture and Livestock-based Livelihood Issues in Different Ecosystems of Rajasthan.

At the Thiruvananthapuram event, the participants were drawn from the Animal Husbandry Department which also hosted the event, veterinary interns and others. The topics covered were: ***Intensive Livestock Production Systems in Kerala: Environmental Issues and Options*** and ***Livestock Products, Food Safety and Health Hazards in Kerala: An Overview.***

D.2.7 CDs

A CD on the several features, tools and databases of the LCP has been brought out and is distributed free of cost at promotional events, Write wroskshops and training programmes.

E. Outreach

The outreach programmes of the LEAD initiative through its electronic and non-electronic communication products and services, have been very successful. The programmes operate at several levels. At the higher end, the website, with its language platforms, experts roster, digital library, decision support tools, institutions database, newsletters, news pages, e-discussion, e-conference and photo gallery, have catered to people who have net access. In India, net access currently being very low, at just 5.3%* of the population, the electronic products and services reach only a very small fraction of the population. On the other hand, the interaction programmes of LEAD – write workshops, training programmes and promotional events have been able to reach out to a larger section of the population. In the latter programmes, the target has been organizations that work in the field of livestock and environment, thereby ensuring that they have a multiplier effect, where information and awareness flows through these agencies to the people who actually benefit from them. The organizations that have been reached through these programmes include government functionaries, NGOs, professionals, researchers and others who have access to the internet. But with internet usage figures growing phenomenally, and initiatives like PURA (Providing Urban Amenities in Rural Areas) and computer facilities being made available in panchayats and rural areas, it is expected that more and more people will access the facilities provided by the LCP in the coming years.

[* <http://www.internetworldstats.com/stats3.htm>]

F. Platform administration

The LEAD Communication Platform is managed by the Knowledge for Sustainable Development (KSD) wing of the Centre for Environment Education. All the three KSD offices at Bangalore, Kannur and Ahmedabad co-ordinate with each other as a team to document, compile and edit information on the activities of the LAN partners and the outcomes of events and programmes organised under LEAD. Regular updating of information on the news, events, workshops, experts and library links, maintaining a database on LEAD issues, photo gallery, research and decision support tools for planners, policy makers and implementers, is undertaken by the team. It also maintains registrations of members and subscriptions to its information including the e-newsletter.

G. Linkage with LAN

The LCP communicates with the LAN through the Bangalore office of the KSD team. Activities are organised and information is gathered through interaction with the staff and resource persons of the LAN partners. Much of the information uploaded on the LCP is obtained from the LAN partners either on request or by voluntary contribution. The LAN partners have provided assistance in organising promotional events, contributions for the newsletter and various other activities.

H. Outputs and Impacts

As outputs, the electronic and non-electronic products and services of LCP have been highly successful in ensuring a network among experts and organizations who, in turn, enable the flow of information and awareness to grassroots levels. A set of 33 case studies developed from the inputs by farmers and livestock rearers is being made available on the website and possible in print soon. The initiative has been successful in bringing together people from various regions to discuss problems and issues related to LEAD, be it through hi-tech e-discussions or down to earth write workshops. Through the promotional events, it has raised the awareness levels of professionals and government departments on current and emerging problems related to livestock. At the national level, a workshop on 'The Role of Education in Addressing LEAD Issues' was organized as part of the 4th International Conference on Environmental Education, November 2007. This workshop was well attended and a set of recommendations were formulated which were then incorporated in the Conference recommendations. Overall, this initiative has shown that a multi-pronged strategy is required to create awareness and action in the field of livestock rearing.

I. Sustainability of the Platform

With a supportive team to update and maintain the LCP and cooperative and enthusiastic LAN partners, the platform is definitely sustainable. The LAN partners are a reliable source of information for the website and provide organisational support and assistance for conducting programmes/activities that feed into the LCP as experiences that the users of the platform can learn from. The platform has been maintained to be very functional and can be sustained with the available funds and access to resources. Additionally, for constant improvisation of the platform so that users can gain greater benefit, a feedback mechanism may be put in place on the website itself for users to contribute their suggestions.

J. Learnings

The key learnings from this initiative has been several. The cooperation and networking achieved through the LCP has helped enhance the awareness and knowledge levels of organizations working in the field of livestock and environment. While critics may question the efficacy of using high end technology like the computer and the internet for educating rural people about the advantages and disadvantages of livestock rearing, the LCP has showed that such technology can be effectively used if the target group is organisations and professionals who work in this field and can transmit their knowledge to grassroots levels. Several emerging issues in livestock have been discussed and debated by various groups of people through some of the communication means provided by the LCP, which have filtered to beneficiaries subsequently. The information flow from the parent site of FAO to LCP and then to various organizations and individuals is a good example of what new technology can achieve even in a field that touches rural areas where net connectivity is very low.

K. Key Message

The key message from the various activities of the LCP has been that a balanced view is called for in the livestock sector. While we need to take a serious view of the negative impacts of livestock production like climate change and land degradation, we also should remember that livestock is an integral part of the agricultural sector and provides a livelihood option for the rural households. Hence, while taking all efforts to mitigate the negative impacts, our focus should be on improving the conditions and factors related to livestock rearing rather than reduction of livestock and thereby livelihood loss for a large no of families. The need of the hour is ecologically sustainable livestock production.