

## CRITICAL LIVESTOCK ENVIRONMENT INTERACTIONS

### Industrial Livestock Production

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.

### Soil, water and air pollution due to excess nutrients

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 resulting 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), The Department of Livestock Development and the Faculty of Agriculture of Kasetsart University (Thailand), the University of Agriculture and Forestry (Viet Nam), the Universidad Nacional Autónoma de México and the



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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.

## THE VIRTUAL RESEARCH AND DEVELOPMENT CENTRE

### Connecting People and Institutions Working on Livestock and Environment Issues

LEAD's multilingual Virtual Research and Development Centre is the data and information repository of the Initiative. The Virtual Centre has the following functions:

- to assist in capacity building in developing countries and function as a "clearing house", disseminate results and provide baseline information and resource intelligence;
- to facilitate international pilot development programmes among research and development institutions and individuals, and assist in carrying out additional studies on livestock environment issues;
- to provide support to decision-making on livestock-environment issues
- to support mainstreaming of livestock and environment policies and technology options in donor operations and in the formulation of national action plans.

The programmes for the general capacity building and clearing house functions of the Virtual Centre are structured along the different critical livestock environment interactions identified.

The programme structure ensures that longer-term environmental concerns and shorter-term human needs are given appropriate emphasis within programmes and ensures that professionals from different disciplines work together to exploit synergies.

The Virtual Centre thus 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.

LEAD is an interinstitutional project with the secretariat in FAO. The initiative is supported by the World Bank, the European Union (EU), the Ministère des Affaires Étrangères (France), The 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), the International Food Policy Research Institute (IFPRI), the Centro Agronómico Tropical de Investigación y Enseñanza (CATIE), the Centre de coopération Internationale en Recherche Agronomique pour le Développement (CIRAD), the International Livestock Research Institute (ILRI), the International Fund for Agricultural Development (IFAD), and the Food and Agriculture Organization of the United Nations (FAO).



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# Livestock,

# Environment and

# Development

# (LEAD) Initiative

## LEADing Livestock Development towards Responsible Use of Natural Resources

**HUNDREDS OF MILLIONS** of poor farm households fully or partially depend on livestock for income and subsistence. Livestock provide them with a steady stream of food and revenues, and help to raise whole farm productivity through the provision of draught power and manure. One-quarter of the world's total land area is used for grazing livestock and an estimated one-fifth of the world's arable land is used for growing cereals for livestock feed. This makes livestock production the world's largest land user.

Rising affluence means that more people can afford the high-value protein that livestock products offer. As a result, global consumption of livestock products is growing much faster than world population. Land and other resources are finite and the option to expand the land area used for livestock to meet increased demand is, in most situations, no longer available. This puts great pressure on the global natural resource base and ways must be found by which livestock production can be increased without damaging the environment.

Livestock do not destroy the environment, people do. Ignorance, indifference and policies which misguide resource use are responsible for environmental degradation. However, growing awareness and political will should provide opportunities to tap the immense development potential that livestock offer, while minimizing environmental damage. The LEAD Initiative is working to turn the recognition of these priority issues into common practice and effective action around the globe.



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### Grazing Lands

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.

### Overgrazing and degradation

Many of the world's grazing areas are threatened with degradation, especially in the semi-arid and subhumid zones. Increased population pressure, together with 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 a sustainable balance between livestock and the environment has been seriously disturbed.

### What can be done?

*To control access and 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 turnover 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 access 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 Sénégalais de Recherches Agricoles.**

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### Wildlife and livestock interaction

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, losses to predators 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 no more than 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 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, 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.**

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### Livestock in Crop Land

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.

### Balancing crops and livestock

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 situations of nutrient deficits, 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.*

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