



International Livestock Research Institute

2001
Annual Report
The poor and livestock mapping:
targeting research for development impact

Cover

Density of poor livestock keepers by farming system, Map 9 from Thornton P.K., Kruska R.L., Henninger N., Kristjanson P.M., Reid R.S., Atieno F., Odera A.N. and Ndegwa T. 2002. Mapping poverty and livestock in the developing world. ILRI (International Livestock Research Institute), Nairobi, Kenya. 124 pp.

ILRI

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Annual Report

2001

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Appreciation

Hank Fitzhugh

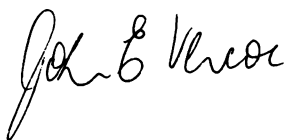
Director General, International Livestock Research Institute (ILRI) 1995–2001

This annual report covers a time of transition, from the period under the direction of ILRI's first director general, Dr. Hank Fitzhugh, which was dominated by the process of establishing ILRI out of the human, physical and financial assets of the International Livestock Centre for Africa (ILCA) and the International Laboratory for Research on Livestock Diseases (ILRAD). Today ILRI is realising its full potential to help improve the livelihoods of resource-poor livestock owners in developing countries.

It is no mean achievement to have successfully made that transition despite the dramatic external and internal changes that ILRI had to withstand. From 1995 to 2001, when drastic falls in funding for international agricultural research and the change from dependency on unrestricted grants to reliance on project funding severely taxed the morale and programmatic integrity of all CGIAR centres, ILRI handled in addition the evolution out of two institutes that could hardly have been more different in goals, culture and modes of operation.

ILRI will always be indebted to Hank Fitzhugh for keeping the support of ILRI's external investors and partners through the transformation while at the same time shepherding many difficult and often painful internal changes. His breadth of knowledge of livestock issues, his total commitment to the institute, his eye for detail and, by no means least, the support of Nancy Fitzhugh were assets from which ILRI benefited enormously.

On behalf of the Board and staff, I thank Hank and Nancy for everything they did for ILRI and wish them the very best for the future.



John Vercoe
Board Chair



Foreword

I introduce the 2001 annual report of the International Livestock Research Institute (ILRI) with pleasure. The highlights presented are a tribute to my predecessor, Hank Fitzhugh, who established ILRI as a leading livestock research establishment meeting the needs of the world's poor.

As we move into the 21st century, the number of people living in poverty is increasing. Nearly a fifth of the world's population survives on less than US\$1 a day; almost half lives on less than US\$2 a day. A third of the children in developing countries are malnourished.

Livestock science can help these people.

Globalisation and scientific advances are creating new options and opportunities. They are also creating new problems and constraints. The challenge for ILRI and its partners is to address sustainable animal agriculture as a 'moving target'.

Livestock production systems, for example, and the households that operate them will experience major changes in the coming decades. ILRI estimates that there are at least 550 million poor livestock keepers globally today. Projections of human population growth and climate changes, along with the increased demand for livestock products throughout the developing world, make livestock operations highly dynamic, with potential to both greatly benefit and hurt poor farmers.

In the following pages we highlight a major contribution ILRI has made to improved targeting of research and development interventions. In 2001, ILRI scientists began an ambitious global spatial analysis of where poverty and livestock intersect in the developing world. With land-use, population and climate-change data obtained from national and international organisations worldwide, and with critical inputs from the African Economic Research Consortium and the World Resources Institute, ILRI undertook innovative analyses using new global datasets that allowed it to locate major populations of poor livestock keepers and to assess how these populations are likely to change over the next half century. With this information, ILRI and its partners and investors are better able to identify regions and agricultural production systems where scientific, policy and technical interventions in animal agriculture are likely to help the greatest numbers of poor people.

ILRI works with partners in the South and the North to bring the best livestock-related science and technology to where it is most needed and can do the most good. It does this only because it has strong support from investors, partners and farmers.

Some of that support comes in the form of core financing provided to the whole institute. This financing is provided by the members of the Consultative Group on International Agricultural Research (CGIAR) and is essential to ILRI's ability to build and sustain research capacity. It has been critical, for example, in building ILRI's world-class GIS facilities. In 2001, special targeted funding from the UK Department for International Development and the US-based Rockefeller Foundation made use of that long-term CGIAR investment to conduct a specific project to map poor livestock keepers.

Such strategic combinations of both core and restricted funding offer complementary ways of financing livestock research that benefits the poor. We are grateful for both.



Carlos Seré
Director General 2002

Highlights in 2001

Some highlights of 2001

JANUARY FEBRUARY MARCH APRIL MAY JUNE JULY AUGUST SEPTEMBER OCTOBER NOVEMBER DECEMBER

A new public-private partnership project focusing on poverty alleviation

The Nigerian Agip Oil Company, through its Green River Project, awarded a grant of US\$ 325,097 to ILRI for implementation of a project on 'Integration of small ruminants into the smallholder farming systems of the oil-producing areas of south-eastern Nigeria'. The aim of the project is to promote improved small-ruminant management practices as a means of increasing the supply of animal protein and alleviating poverty through the generation of employment and additional income while protecting the environment. The project is being implemented in the lowland state of Bayelsa and the upland states of Rivers, Delta and Imo.

For more information contact t.williams@cgiar.org

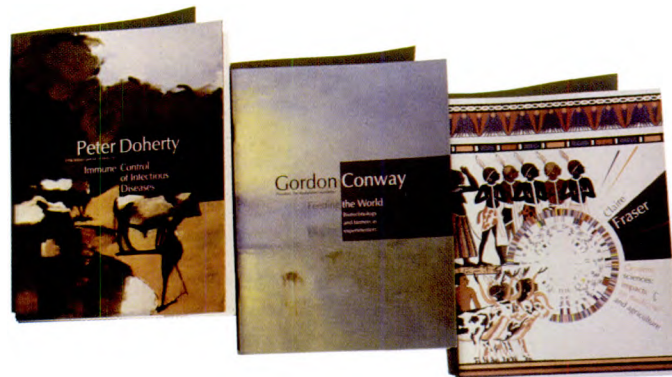
JANUARY FEBRUARY MARCH APRIL MAY JUNE JULY AUGUST SEPTEMBER OCTOBER NOVEMBER DECEMBER



On Friday, 30 March, Ms Catherine Bertini, the then president of the World Food Programme, gave the annual Doherty lecture in Addis Ababa. The lecture focused on food security in the Horn of Africa. Representatives of the diplomatic community and international organisations attended the event. The lecture was fourth in a distinguished lecture series in honour of Peter Doherty, Noble Laureate in Medicine 1996, and former member of the Board of Trustees of the International Laboratory for Research in Animal Diseases (ILRAD), predecessor of ILRI. The inaugural lecture by Peter Doherty was given in 1998 and focused on 'Immune control of infectious disease'. Other Doherty lecturers were Gordon Conway, president of the Rockefeller Foundation, and Claire Fraser, president and director of The Institute for Genomic Research (TIGR).

- Doherty, P. 2001. Immune control of infectious disease. Inaugural Peter Doherty distinguished lecture. 14 Apr 1998, Nairobi (Kenya). ILRI, Nairobi (Kenya). 24 pp.
- Conway, G. 2001. Feeding the world: ecology, biotechnology and farmers as experimenters. Second annual Peter Doherty distinguished lecture. 24 Sep 1999. ILRI, Nairobi (Kenya). 32 pp.

- Fraser, C.M. 2001. Genomic sciences: impacts on medicine and agriculture. Third annual Peter Doherty distinguished lecture. 1 Dec 2000. ILRI, Nairobi (Kenya). 33 pp.



For copies of the Doherty Lecture Series, please contact ilri@cgiar.org or ilri-information@cgiar.org

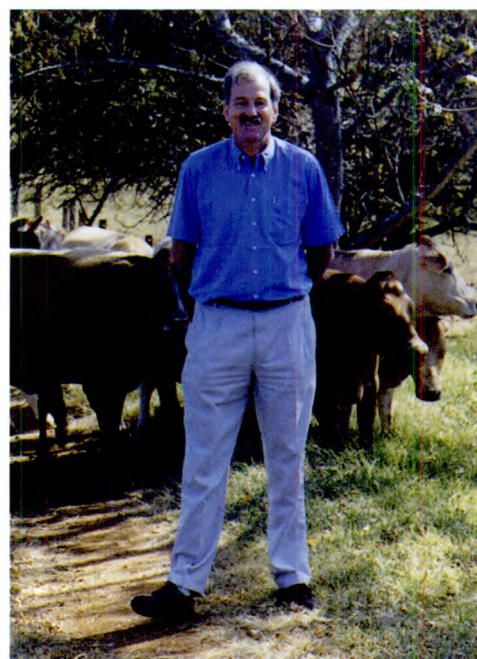
JANUARY FEBRUARY MARCH MAY JUNE JULY AUGUST SEPTEMBER OCTOBER NOVEMBER DECEMBER

ILRI's Board of Trustees names Carlos Seré new director general 2002

Carlos Seré, an Uruguayan with a doctorate in agricultural economics from the University of Hohenheim, Germany, is the second person to lead ILRI, after founding director general Hank Fitzhugh left office in December 2001.

Carlos Seré has worked for the Latin America and Caribbean office of the International Development Research Centre (Canada), first managing a portfolio of agricultural and natural resource management projects and, starting in 1996, serving as regional director.

Carlos Seré has served the CGIAR as both staff member and reviewer. From 1980 to 1990 he was an economist with the Centro Internacional de Agricultura Tropical, in Colombia. In 1992 and 1994, respectively, he reviewed the programme and management of the International Laboratory for Research on Animal Diseases (ILRAD), one of ILRI's two predecessors, and the International Potato Center (CIP) in Peru. In 1994, Carlos Seré served on the team that developed a strategic plan for the then newly created ILRI, which began operations in January 1995.



Chinese Minister of Agriculture visits ILRI, Nairobi



On Thursday, 17 May 2001, the Honourable Mr Fan Xiaojian, Vice Minister for Agriculture of the People's Republic of China, visited the ILRI Nairobi campus. He was accompanied by His Excellency Ambassador Qiwen Du, ambassador extraordinary and plenipotentiary of the People's Republic of China to Kenya, and several officials from the Chinese embassy and by Mr Nzuva of the Kenya Ministry of Foreign Affairs.

Another important visit to ILRI: farmers from Harar and Somali regions

Twenty-two farmers from Harar and Somali regions, trained for 6 months in agro-ecology by Menschen für Menschen Foundation, paid an educational visit to the ILRI Debre Zeit research station. The farmers were briefed about the main objectives of ILRI and the various research programmes undertaken at the station. Forage genetic resources in relation to feed development and natural resource management were of particular interest to the visitors.

Training and information dissemination in formal workshops and informal visits are a vital part of ILRI. The sharing of information is central to ILRI's work. The flow goes both ways, from ILRI to stakeholders and partners, and from stakeholders and partners to ILRI.

For more information about training at ILRI, contact v.adell@cgiar.org

JANUARY FEBRUARY MARCH APRIL JUNE JULY AUGUST SEPTEMBER OCTOBER NOVEMBER DECEMBER

tpa1 – a database of preliminary information on the *Theileria parva* genome sequence

The Institute for Genomic Research (TIGR) and ILRI announced in early June 2001 the creation of a website allowing immediate access via the Internet to sequence data from the *Theileria parva* genome project. This tick-borne parasite is the cause of a deadly disease of cattle called East Coast fever (ECF) that has a severe impact on the livelihoods of poor farmers in sub-Saharan Africa and constrains their adoption of high-producing cattle. The release of this preliminary information to the scientific community will underpin the development of novel technologies for reducing the devastating impact of ECF and will help investigators working on related pathogens worldwide in their search for new vaccines and diagnostics.

TIGR and ILRI scientists are collaborating to sequence the entirety of *T. parva* genomes, which consists of four chromosomes and is approximately 9 million base pairs in length. A whole genome shotgun sequencing strategy is being employed. A BLAST server that allows retrieval of preliminary sequence information has been installed at TIGR. Upon completion of the project, the whole genome sequence and associated annotation data will be released on this website and also submitted to public databases.

For more information see <http://www.tigr.org/tdb/> or contact s.morzaria@cgiar.org or Vish Nene at nene@tigr.org



The largest grant proposal ever submitted by ILRI found support by UK-DFID (Department for International Development).

The goal of the project is to develop a safe, affordable and highly efficacious sub-unit vaccine against East Coast fever, a killer disease of cattle that affects the livelihoods of poor smallholder farmers in eastern, central and southern Africa. This vaccine will generate significant benefits for poor people by contributing towards strategies for the sustainable control of livestock diseases.

Title:	Integrated control of East Coast fever constraining livelihoods of smallholder farmers in sub-Saharan Africa
Investor:	United Kingdom – Department for International Development
Grant:	UK£ 5,110,000 over 3 years
ILRI programme:	Livestock Health
ILRI scientists involved:	molecular parasitologist Subhash Morzaria, molecular biologist Vish Nene and cellular immunologist Evans Taracha
Partners involved:	Partners involved: Kenya Agricultural Research Institute and Veterinary Department, Organization of African Unity, International Bureau of Animal Resources, Kenya; Veterinary Department, Tanzania; Livestock Research Institute and Veterinary Department, Uganda; Institute of Animal Health, Centre for Tropical Veterinary Medicine, University of Edinburgh, University of Oxford, University of Glasgow, University of York, Roslin Institute, United Kingdom; University of Victoria, Canada; Ludwig Institute for Cancer Research, Belgium; The Institute for Genomic Research, United States of America

For more information contact s.morzaria@cgiar.org or e.taracha@cgiar.org



OCTOBER

Hank Fitzhugh named honorary member of a dairy cooperative in Debre Zeit town

Hank Fitzhugh became an honorary member of the Adaa-Liben District Dairy and Dairy Products Marketing Cooperative in Debre Zeit town in Ethiopia on the occasion of the ILRI Open Day on 6 October 2001. The cooperative, which was established in 1998, has made significant strides in milk production and marketing in and around Debre Zeit. ILRI has been supporting the cooperative in organisation, project preparation, advice and training since its inception. Members of the cooperative made an impressive presentation on their success story during the ILRI open day. In recognition of the contributions of ILRI to the cooperative, its executive committee invited Dr Fitzhugh to become an honorary member and issued him an identification card.

Other awards to staff in 2001 include

- The Purdue distinguished Agricultural Alumni Award of Purdue University, USA, to Simeon Ehui. Simeon and Mamou Ehui are the first couple to receive Purdue University's prestigious Distinguished Agricultural Alumni Award. They received their awards from Vic Lechtenberg, dean of the School of Agriculture, during April 20 ceremonies on the Purdue campus.
- The Peter Doherty Award for Outstanding Young Scientists of the CGIAR to Alexander Kahi, for his research on smallholder dairy systems undertaken as a graduate fellow with ILRI and the University of Hohenheim, Germany.



For more information on Alexander Kahi, see 'Training at ILRI' on page 68.

NOVEMBER

International conference on 'Sustainable crop-livestock production for improved livelihoods and natural resource management in West Africa' Ibadan, Nigeria, 19-22 November 2001

Growth in human population and the resulting demand for food is bringing to the fore the critical importance of crop-livestock systems and the pressures confronting them in West Africa. Steering these systems towards sustainable production for improved livelihoods and natural resource management was the topic of a conference jointly organised by ILRI, CTA and other partners.

More than 80 participants from sub-Saharan Africa, Europe and Asia representing farmers' associations,



NGOs, donor agencies, policy makers and scientists examined how crop–livestock systems will adapt to population growth, urbanisation and globalisation in the coming years. They predicted that farms will get smaller and technologies will be needed that promote intensification of crop–livestock systems and enhance land productivity. Specialised crop and livestock systems were expected to evolve according to market forces, and the challenge was seen in the need to make them evolve in a sustainable manner, with minimum negative environmental effects. Emphasis was put on the need for policy research to identify possibilities to promote technology adoption and to improve smallholders' access to markets to enhance their incomes and livelihoods.

For more information contact t.williams@cgiar.org



China liaison office opens in Beijing



The opening of the ILRI liaison office in Beijing was marked by unveiling a plaque by Hank Fitzhugh.

Hank Fitzhugh, C. Devendra, Doug Gray and Han Jianlin travelled to Beijing to attend the formal opening of the ILRI liaison office in December in the headquarters of the Chinese Academy of Agricultural Sciences (CAAS). Representatives from the Chinese Ministry of Agriculture, the World Bank and from Danish, Ethiopian, Kenyan and US embassies participated in the opening. ILRI joined five other centres of the Consultative Group of International Agricultural Research with adjacent offices in CAAS: Centro Internacional de la Papa (International Potato Centre), Centro Internacional de Mejoramiento de Maize y Trigo (International Maize and Wheat Improvement Centre), International Food Policy Research Institute, International Plant Genetics Resources Institute and International Rice Research Institute. Thanks went to Xianglin Li, ILRI's liaison scientist, and to Dr Gong Xifeng of CAAS for their exceptional efforts in establishing ILRI's permanent presence in China and to Vice President Zhang Lijian and President Huqu Zhai for their hospitality.

Xianglin Li can be contacted at x.li@cgiar.org



livestock

poor
map

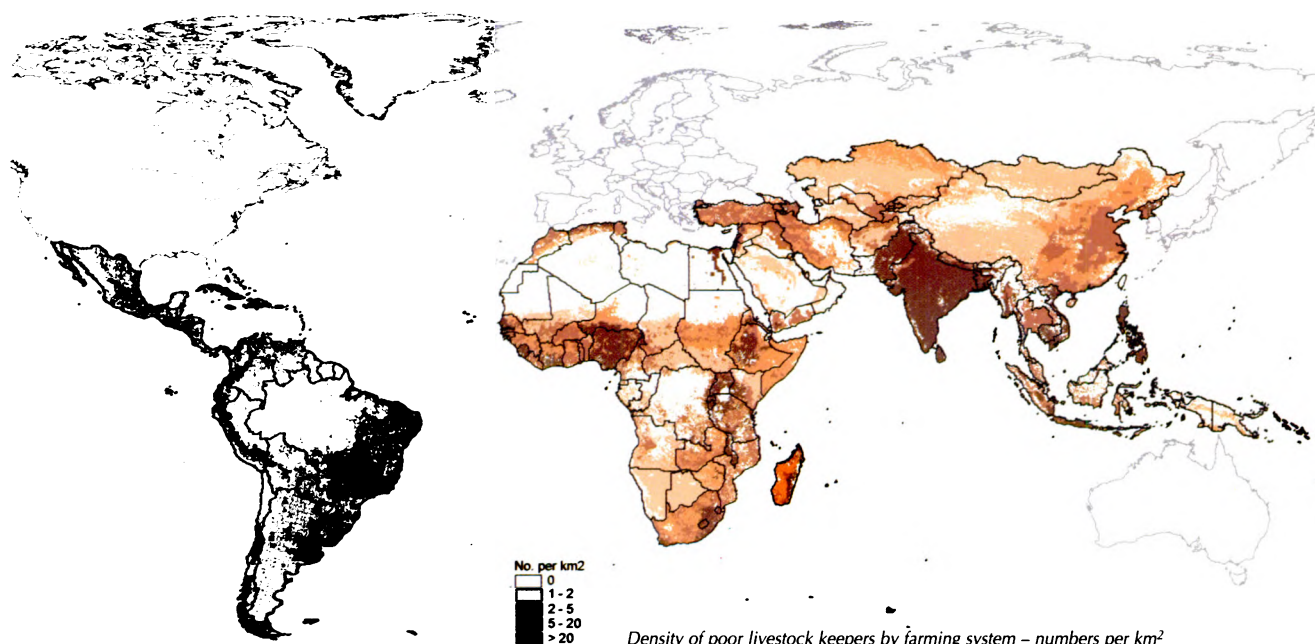
Putting livestock and the needs of the poor on the map

Mapping poverty and livestock in the developing world



The reduction of poverty worldwide is a challenge for the international community that has yet to be met. Funding agencies have been made increasingly aware of the need to target development aid to benefit the poor more effectively.

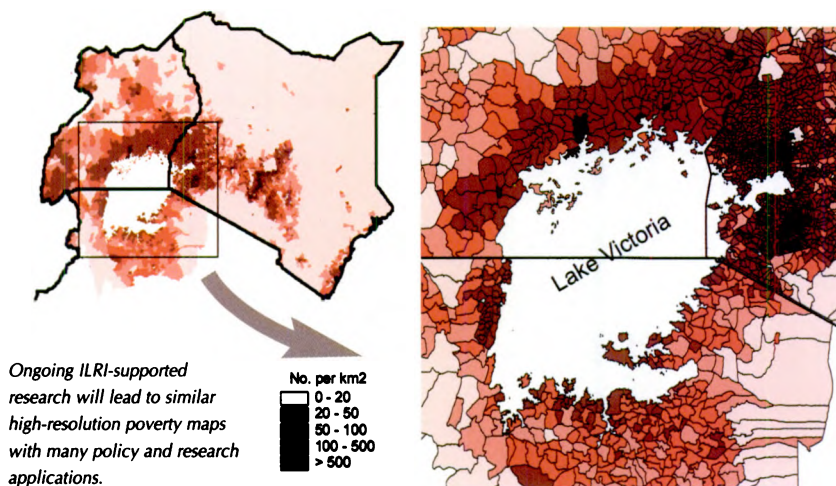
In many developing countries, livestock are an important asset of the poor, providing livelihoods under conditions where other enterprises fail. To realise the full potential of the livestock sector for poverty reduction, donors and researchers have to know where livestock are important for the poor. They also must know which livestock



Inputs into this map and the others found in the report include ideas and data from the following organisations:

- The World Bank, United Nations, FAO, CIAT, TAC (CGIAR), IWMI, IFPRI
- The Central Bureaus of Statistics in Kenya, Tanzania and Uganda, and African Economic Research Consortium researchers, for welfare-monitoring survey data
- The African Economic Research Consortium with African researchers from 14 countries
- The United States Geological Survey for land cover data
- The World Resources Institute

For an example of the application of spatial analysis to dairy smallholder issues, see p. 25.



species are the most important in any community or system, and what are the most severe constraints to enhanced livestock productivity. With such information donors and researchers can determine the best options for intervention to benefit resource-poor farmers.

In 2001, ILRI's Systems Analysis team and several collaborators, led by Philip Thornton, reached a milestone in the effort to make development research and aid more targeted, more efficient and more effective. Using spatial analysis to integrate census and survey data from various sources with geographic information system (GIS) data layers, the group produced a set of global maps that show, for the first time, where the major agricultural production systems relating to livestock are found (for example dry pastoral systems versus wet mixed crop-livestock systems), and where the poorest populations are located in relation to these systems.

Never before had poor livestock keepers been put on the map on a global scale. In

addition, the study showed how these maps are expected to change over the next 50 years with population growth and climate change. Other drivers of change have not been included yet, but the groundwork for this has been laid. The creation of the maps required the development of new tools and methods that will allow further inclusion and analysis of data from various sources. The higher-resolution poverty maps can be used to correlate poverty and livestock keeping with other parameters, be

and livestock in the developing world' was commissioned by the British government's Department for International Development (DFID) on behalf of a group of donor agencies. DFID has been committed to achieving International Development Targets in poverty reduction by the British government's recent White Paper on international development (2000). This has important implications for DFID's investment in livestock (and other) research. Crucially, tools are needed to aid decisions about optimal resource allocation so that the investments in research in the end indeed benefit the poor of the world in a substantial way.

International development targets for poverty reduction include:

- a reduction by one half in the proportion of people living in extreme poverty by 2015
- universal primary education in all countries by 2015
- a two-thirds reduction in infant and under-fives mortality rates and a three-fourths reduction in maternal mortalities by 2015

United Kingdom Government. 2000. Eliminating world poverty: making globalisation work for the poor. December 2000. www.globalisation.gov.uk



they soil quality, rainfall or political stability. Several developing countries are already using poverty mapping tools, developed by the World Bank and other agencies, to conduct their own higher-resolution analyses for more effective national poverty reduction programmes.

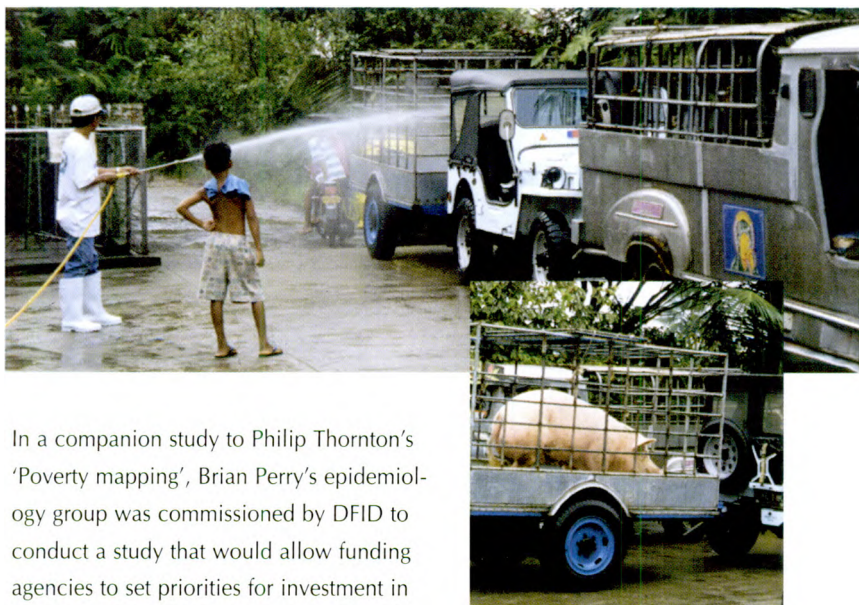
Poverty mapping tools have been strengthened by these new livestock inputs, and the maps and accompanying report will help donor agencies to allocate resources and set priorities for research and development programs.

Thornton P.K., Kruska R.L., Henninger N., Kristjanson P.M., Reid R.S., Atieno F., Odero A.N. and Ndegwa T. 2002. Mapping poverty and livestock in the developing world. ILRI (International Livestock Research Institute), Nairobi, Kenya. 124 pp.

The publication may also be found on the websites of DFID and ILRI: www.DFID.gov.uk and www.ilri.org

Setting priorities in animal health research for poverty reduction

How diseases and their control affect the poor



In a companion study to Philip Thornton's 'Poverty mapping', Brian Perry's epidemiology group was commissioned by DFID to conduct a study that would allow funding agencies to set priorities for investment in animal health research aimed at poverty reduction. Both studies were conceived through an initiative of several major international agencies that support livestock research with the objective of coordinating and focusing further investments to achieve greater efficiency and more impact on poverty reduction.

Perry and colleagues' study on animal health focused mainly on infectious diseases in sub-Saharan Africa, South Asia and South East Asia as major geographic areas of importance in poverty alleviation. The study commissioned expert reviews and set up regional workshops that involved representatives from the major stakeholder groups for the purpose of identifying the major health problems that afflict the different livestock species kept by the poor.

Disease constraints were documented, classified and ranked according to their importance in socio-economic, zoonotic and national spending terms. Research opportunities

were identified to alleviate disease constraints and they were categorised in terms of time frame, annual cost and probability of success.

These research opportunities were divided into categories according to how they would contribute to pathways of poverty alleviation, namely through 'securing assets', 'reducing constraints to productivity' or 'improving market opportunities', as well as in three

The estimated impact of foot-and-mouth disease control in South East Asia: As global marketing becomes more and more a reality, epidemic diseases like FMD affect marketing and export opportunities. Brian Perry and his colleagues at ILRI and in Thailand and the Philippines therefore decided to investigate the economic advantages of different control and eradication scenarios and the benefits of improved access to export markets through implementation of policies to control FMD. In both Thailand and the Philippines, it was concluded that FMD control, and particularly eradication, could be a sound investment for the national economy, especially if access to higher-priced export markets in pork could be achieved.

The study also found that the largely public sector supported measures to control FMD might initially benefit big commercial producers more than the smallholder sector. This emphasises the need to explore private sector contributions to the funding of FMD control measures. It also highlights the need to formulate policies and new technologies including vaccines that will help smallholders participate in gains from raising profits through better export market access. ILRI's work on FMD control aims to assess the risks and chances for smallholders in changing markets and to provide information for policy makers to enable sustainable development to benefit the poor.

For more information, contact b.perry@cgiar.org



different research and development categories, namely 'transfer of knowledge and available tools', 'improved tools, better strategies, better delivered' and 'new tools and approaches'. The study showed that it is not useful to look for one 'most important' disease to be targeted by research. Relevant animal health research has to take the farming system and its requirements among many factors into account to have impact on the livelihoods of the poor.

Perry B.D., Kalpravidh W., Coleman P.G., Horst H.S., McDermott J.J., Randolph T.F. and Glesson L.J. 1999. The economic impact of foot-and-mouth disease and its control in South East Asia: a preliminary assessment with special reference to Thailand. *Revue Scientifique et Technique d'OIE (OIE Scientific and Technical Review, France)* 18(2):478-497.

Perry B.D., McDermott J.J. and Randolph, T.F. 2001. Can epidemiology and economics make a meaningful contribution to national animal-disease control? *Preventive Veterinary Medicine (The Netherlands)*. 48:231-260.

The publication may also be found on the websites of DFID and ILRI: www.DFID.gov.uk and www.ilri.org

Improved cowpea varieties

What good does systems analysis do the poor?



Cowpea is a most versatile African crop: it feeds people, their livestock and the next crop. In the Americas, also known as 'black-eyed peas', cowpea is a high protein food, and very popular in West Africa. The plant itself can be dried and stored until needed as fodder for livestock. As a nitrogen-fixing legume, cowpea improves soil fertility, and consequently helps to increase the yields of cereal crops when grown in rotation.

Cowpea is referred to as the 'hungry-season crop' since it is the first crop to be harvested before the cereal crops are ready. It is a crop that offers farmers a lot of flexibility. They can choose to apply more inputs and pick more beans, or if cash and inputs are scarce, they can pick fewer beans and allow the plant to set more foliage. This means more fodder for livestock, so that lower bean yields are balanced by more livestock feed, which in turn translates into more meat and milk. Cowpea provides a source of cash income for women farmers who make and sell snack foods from this nutritious legume. It is this flexibility in use that makes cowpea an excellent crop under the challenging climatic conditions faced by African farmers.



Farmers stack dry cowpea fodder in trees for storage, out of reach of wild antelopes.



On the left side traditional cowpeas, on the right side the improved variety. In the back, rows of cowpeas are interspersed with rows of maize. In alternating seasons, farmers shift the planting pattern by one row so that the maize or sorghum or millet profits from the nitrogen bound in the soil by the cowpeas in the previous season.

Scientists at IITA (International Institute for Tropical Agriculture) and ILRI, along with many partners, have been developing an improved genetic variety of cowpea that gives more fodder than traditional strains while maintaining grain yields. Shirley Tarawali, a scientist who holds a joint position with IITA and ILRI, and Patti Kristjanson of ILRI's Systems Analysis and Impact Assessment group and their colleagues in both institutes have been working together with National Agricultural Research Systems (NARS) and local farmers in West Africa to provide an impact assessment of the potential net returns to the improved cowpea research.

This *ex ante* impact assessment includes information on adoption, costs and benefits of using the new cowpea varieties. Nigerian male and female farmers participated in the assessment that shows how households are using and benefiting from the new technology.

This research collaboration has given farmers a voice to articulate their needs and identify the improvements they are looking for. IITA and ILRI researchers were helped in defining their research goals to meet these needs. Local decision makers are also now more aware of policy options to aid these farming households.

What is 'Systems Analysis and Impact Assessment' and what does it have to do with the poor, or livestock?

The underlying concept is simple: One can only influence, and improve, something that one understands. We need to understand how, where and why smallholders keeping livestock operate before we can offer options for improvement that will actually work, and not just look good on paper.

Impact assessment provides feedback to researchers and donors on how effective a project has been. In technical jargon, this would be called '*ex post*', meaning 'in hindsight'. But what about 'in advance'? Systems analysts call this '*ex ante*'. ~~Impact~~ impact assessments are powerful tools to give researchers feedback about the suitability of their approach even before implementation has started. In other words, they allow projects to be optimised before bringing them into the field, and to recognise pitfalls before they jeopardise poor farmers. In practice this means that two streams of research run in parallel, one on the technical side of a problem – in this example how to improve the value of cowpeas – and one on the impact side – what is the gained value for every research dollar spent? Ideally, insights from the *ex ante* assessment feed continuously into project design improving it 'on the go', a process that saves valuable resources and time.



Patti Kristjanson listens to expertise offered by a group of Nigerian women.

The *ex ante* impact assessment of improved cowpea varieties has been an important tool for making sure that the research outcome is directly targeted to benefit the poor farmers of West Africa in a tangible way.



For more information, contact p.kristjanson@cgiar.org

Kristjanson P.M., Tarawali S., Okike I., Singh B.B., Thornton P.K., Manyong V.M., Kruska R.L. and Hoogenboom G. Genetically improved dual-purpose Cowpea: *ex-ante* assessment of adoption and impact in the dry savannahs of West Africa. International Livestock Research Institute Impact Assessment Series Number 9. ILRI, Nairobi, Kenya. In press.

Okike I., Kristjanson P., Tarawali S., Singh B.B., Kruska R. and Manyong V.M. 2001. An evaluation of potential adoption and diffusion of improved cowpea in the dry savannahs of Nigeria: a combination of participatory and structured approaches. In: Proceedings from the World Cowpea Research Conference III, IITA, Ibadan, Nigeria, Sept. 2000. IITA, Nigeria.

The South–South workshop on
smallholder dairy production
and marketing

The South–South workshop on smallholder dairy production and marketing

Combining expertise for the benefit of the poor



Few markets of economic significance may be as under-appreciated as the informal dairy sector. A high proportion of the total dairy production in many countries is derived from the smallholder dairy sector. In Brazil, half of all traded milk is marketed in the informal sector, in Costa Rica one-third, in Uganda and

Tanzania over 90%, to give a few examples. In India, whose dairy market recently surpassed the USA's to become the world's biggest, 85% of the milk is traded in the informal and traditional sector. This milk is mainly produced by smallholders with one or two cows or buffaloes.



For these smallholders, a dairy animal is more than a milk source. It often represents the household's largest single **savings mechanism**. What's more, it helps to improve the soil through its manure. As pressure on

'Livestock functions as a **savings mechanism** to compensate for losses in times of need.... The sale of one buffalo can pay a hospital bill and save a life, yet many villagers said they would rather die and leave the buffalo for their family.'

From 'Participatory poverty assessment: Lao People's Democratic Republic', a study report published in 2001 by the Asian Development Bank.



land increases, farmers recognise the benefit of organic matter and nutrients from manure in sustaining the productivity of their fields. Since the animal is often fed with fodder collected off the farm, from communal land or even the roadside, the manure constitutes a net input to the nutrient balance of the farm.

The employment generated by the informal dairy sector is of enormous economic importance and holds great potential for improving the livelihood of the poor.

Employment generation in the informal milk market, is a significant economic factor:

Every 30 litres of milk produced and handled per day in the informal sector provides a livelihood for one person. For comparison, 2500 litres of milk flow per day are required in the Netherlands to generate a single job.

Identifying the major issues affecting dairy smallholders is a major challenge faced by many governments and development agencies. To bring together experts from different parts of the world to exchange their views and experiences, India's National Dairy Development Board (NDDB) and ILRI hosted a South-South workshop on 'Smallholder dairy production and marketing – constraints and opportunities'. The workshop was co-sponsored by the Australian Centre for International Agricultural Research (ACIAR) and held at NDDB's headquarters in Anand, India. Participants were drawn from countries in sub-Saharan Africa and Asia and joined by representatives from ACIAR, ILRI, NDDB and the Swiss Agency for Development and Cooperation.



The workshop recognised:

- the commonality of many issues related to smallholder dairy production and marketing in the countries of the South
- the richness of the experiences in the South applicable to the improvement of the livelihoods of the landless, the marginalised and smallholders through dairy production
- the key role that market-orientation and participatory approaches play in fostering effective efforts in support of dairy development
- the large benefits, actual and potential, for exchanging experiences among the countries of the South
- the importance of taking advantage of the new generation of information technologies to ensure more effective exchange of information in the South
- the willingness and enthusiasm of the participants to work together to plan the agreed actions and to mobilise the resources required for their implementation.



Most of the world's milk is traded like this, from one neighbour to another, or through small-scale traders. The quantities are small, for use on the same day, as refrigeration is not available. The milk is not pasteurised or treated in any way, which keeps the cost down. Milk is generally boiled before consumption, so that the trade of raw milk poses minimal safety risk. Nevertheless, ILRI with partners is studying the health and safety aspects of trade of raw milk in informal and traditional markets to identify ways in which any risks can be further reduced.

Who in Kenya can keep a milk cow? Land size does not always matter as much as one might expect:



To find out what factors determine the possession of a dairy cow in Kenya, household surveys and GIS data were linked through spatial analysis. Surprisingly, land size was not a significant factor, just as it did not matter whether the head of the household was a man or a woman – often seen as an indicator for relative wealth. Much more important is access to infrastructure. The distance of a farm to the nearest main road and dairy collection station is a good predictor as to whether a household has a milk cow or not, as is access to veterinary care and artificial insemination services.

Spatial analysis on a large scale is described on pages 15 ff.

For more information, see www.ss dairy.org

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Protecting valuable
assets for the poor

Protecting valuable assets for the poor

Protecting genetic resources

"FAO estimates that somewhere in the world at least one breed of traditional livestock dies out every week. Many traditional breeds have disappeared as farmers focus on new breeds..... Of the 3831 breeds of cattle, water buffalo, goats, pigs, sheep, horses, and donkeys believed to have existed in this century, 16% have become extinct and a further 15% are rare."

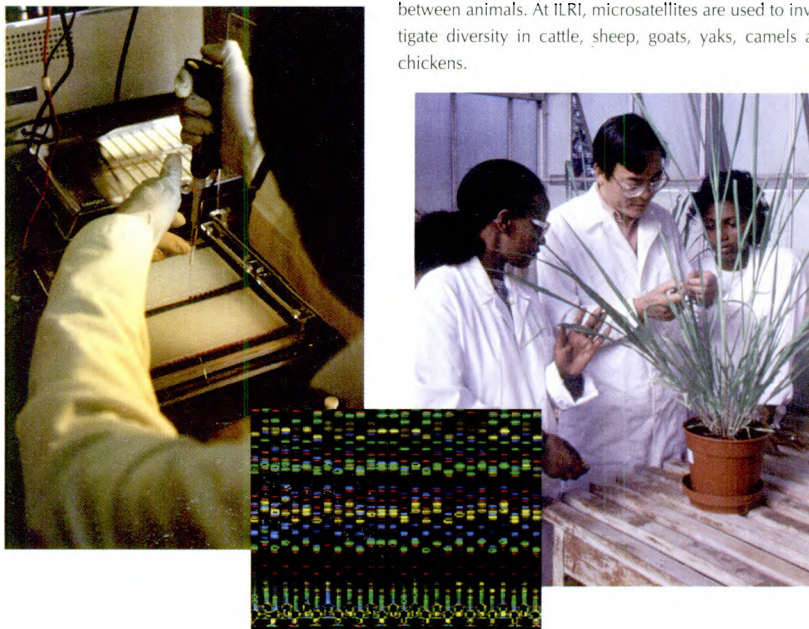
L.A. Thrupp., Linking biodiversity and agriculture: challenge and opportunity for sustainable food security (World Resources Institute, 1997).

<http://www.wri.org/wri/sustag/lba-home.html>

Indigenous livestock worldwide are disappearing at an alarming rate. At least one breed of traditional livestock dies out every week. At the same time, we are only beginning to understand how well adapted these breeds are to local conditions. One of ILRI's goals is to conserve genetic diversity of livestock and forage plants and to optimise the conservation and utilisation of genetic resources for the benefit of the poor.

Genetic variation is the raw material for all animal and plant breeding. It is generally accepted that conservation of biodiversity is a highly desirable goal, but at the same time the techniques of actually doing so are expensive and elaborate. Any effort to conserve genetic diversity, regardless of the technique, is therefore forced to set priorities. Characterisation of genetic diversity provides insight into genetic relationships that helps ensure that conservation maintains the greatest amount of diversity.

Genetic diversity can be measured by comparing microsatellites, short repetitive DNA sequences that occur throughout the genome. Microsatellites are highly variable and the degree of similarity between microsatellites in the same position is an indicator of the phylogenetic relationship between animals. At ILRI, microsatellites are used to investigate diversity in cattle, sheep, goats, yaks, camels and chickens.



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Protecting livelihoods in Ghibe, Ethiopia



The Ghibe Valley, situated in a remote region of south-western Ethiopia, is a place of haunting beauty and tranquillity. For hundreds of people who have settled here over the last few years it is a peaceful place to make a modest living by raising their oxen to plough their fields and milking their cows to feed their families. Sixteen years ago, however, the scene was very different. An epidemic of **trypanosomosis** wreaked havoc and hundreds of cattle died. When ILRI started research in the valley in 1986 only a couple of hundred cattle could be found in the Ghibe Valley, and oxen rarely survived more than one planting season. Today, in this same spot, there are literally hundreds and hundreds of cattle.

Trypanosomosis, the livestock equivalent of human sleeping sickness, costs sub-Saharan countries around US\$ 10 billions annually. This does not include indirect losses due to unavailability of manure or draught power. Trypanosomes are transmitted by the bite of the tsetse-fly and live in the bloodstream of infected cattle. Diseased cows become cachectic and fail to convert the food that they consume into products: no growth, no milk, no calves, no draught power.

What happened? ILRI's reason for going to Ghibe in the first place was to obtain data on the local zebu cattle, which were so obviously susceptible to infection by trypanosomes, for comparison with data on trypano-tolerant cattle collected at other research sites in Central and West Africa. Every month from 1986 to 2001 approximately 800 cattle from this and another site lower down the valley were weighed and blood was sampled; every month those with the parasite detected in the blood and showing anaemia were treated with drugs. In addition, tsetse flies were trapped monthly to measure the challenge imposed on the cattle.



This longitudinal study has produced 16 years of data, rare these days, the quality of which has enabled ILRI to work at the forefront of epidemiological and socio-economic research. But it is the impact on the lives of the farmers that is even more staggering.

Soon after ILRI began working at Ghibe it became apparent that drug treatment was failing to cure the disease. Serum samples were collected and tested in the laboratory in Nairobi, and the parasites were found to be increasingly resistant to drugs available for the treatment of trypanosomosis in cattle. This made drug treatment on its own ineffective, and some way needed to be found to keep the **tsetse** at bay. The solution for the upper Ghibe Valley proved to be an insecticidal 'pour-on', a permethrin applied to the backs of the cattle. Each month farmers brought their cattle for the pour-on treatment. A cost-recovery scheme was introduced whereby ILRI provided the drug at cost to farmers, who kept the decision as to which animals to treat. Not only did the numbers of tsetse fall dramatically but the treatment had an impact on other biting flies too. No longer irritated by the presence of flies, cattle grazed now in peace. Trypanosomosis rates decreased, calf birth rate increased, more animals survived, and 10 years later the herd of one farmer, Ato Bekele, to give just one example, had risen from 4 to 40 head.

Tsetse flies are the only fly whose bite transmits trypanosomes to cattle. One way to control trypanosomosis is to prevent the transmission step by keeping the tsetse fly off the cattle. 'Pour-on' treatment does this very effectively in the upper Ghibe Valley.



ILRI's scientist on the ground Woudyalew Mulatu has worked conscientiously and painstakingly with the farming community to achieve this success. By his modesty this has become ILRI's best kept secret, yet one that has had major impact on poverty reduction in the valley.

What remains to be done? Insecticidal pour-ons on their own are not totally successful in all situations, and at the lower Ghibe site, control of the tsetse fly has been more problematic. More needs to be done to choose the appropriate methods of tsetse control to fit each situation. For the upper Ghibe Valley ILRI is now actively engaged in investigating options for the community to join up with government and non-governmental organisations in organising the treatment themselves. Maybe in a year or two ILRI will be able to leave Ghibe in the knowledge that its inputs are no longer required and that the sustainability of the application of this technology has been secured.

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Protecting ecosystems

Can wildlife and pastoralism enter a win-win relationship?



Since people keep animals as a means of securing food supply, pastoralists have made use of areas where the soil and/or climatic conditions are unsuitable for crop production. In fact, rangelands cover some two-thirds of the entire land surface of the earth. In many places, soil degradation is a serious challenge to the productivity of the system, as are climatic changes and the problem of growing pressure on the land by an ever-increasing population.

Robin Reid has had a long-term interest in the interactions of people, livestock and wildlife. In her quest of a useful way to measure the effects of [REDACTED] the environment, she found the presence of big mammals proved to be a most sensitive indicator. Different species disappear at different stages of land-use changes, so that the presence or absence of different species indicates the degree of pressure on the land.

To describe and define the impact of [REDACTED] Reid analysed the distribution of wild mammals deep inside parks, bordering livestock grazing land, and right where the livestock were. Her finding was that the most variety and the highest concentrations of wildlife were found not inside the parks, but rather in the neighbourhood of grazing livestock. Reid wants now to look at the soil itself to find out whether the diversity above ground is matched by diversity underground. In a collaboration of Maasai communities, the Maasai Mara Reserve, The Institute for Genome Research, the Tropical Soil Biology and Fertility Programme, the International Centre for Agroforestry, Colorado State University and the United States Geographical Survey, microbial diversity in soil samples will be analysed. This could be a very good and sensitive indicator for soil health, an important parameter for the health state of the entire ecosystem. Only a healthy ecosystem can be a productive ecosystem, and that is what both herders of cattle and wildlife alike need.



Maasai researchers are trained by Sue Phillips of the US Geological Survey to sample DNA from soil.



When looking at the distribution of the wildlife, however, Robin Reid and her colleagues found a most surprising result: Not all mammals prefer to live as far as possible from people. On the contrary, big herbivores like wildebeest and zebra follow livestock, albeit at some distance. In fact, it is not exactly the livestock itself they are following, it is the effects of the grazing that they are after. Where pastoralists drive their herds for grazing, the pastures improve, similar to the effects of a bush fire. The stimulated young growth is twice as nutritious as tall savannah grass. An additional positive side effect of staying close to livestock might be the protection against predators that herbivores derive from 'multi-species assemblies'. These scenic assemblies of different species, of gazelles, zebras and giraffes, are a familiar sight for safari and wildlife film enthusiasts all over the world. Every species contributes its own strength to the group in detecting predators – a gazelle's ears for sharp hearing or an extra-long giraffe neck for improved visual surveillance. This tendency to seek the company of other herbivores might be extended to livestock herds.



Whatever the most important reason is, Robin Reid's group studies have demonstrated that wildlife diversity is highest in the interface between human settlements and wildlife, and similarly on the boundaries of wildlife parks. This surprising result shows that wildlife can gain from the presence of settlements and pastoralists. But can the people gain, too? Reid's answer is yes. The income derived from rangelands can be higher through wildlife tourism than from livestock use. The existence of both land-use forms side by side could be most beneficial for the maximisation of income and food security in rangeland areas.

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Farmers fighting poverty
– as research partners . . .

Farmers fighting poverty – as research partners

Researching technologies
to raise goats more productively in South-East Asia



In a tightly-knit network of national and international research organisations, provincial and local government units and local farmer-partners, ILRI has initiated a project on 'sustainable parasite control' (SPC) for goats and sheep. The project puts the experience and expertise of farming communities at the centre of the research.

The project started in 1998 as one of the first projects of ILRI based in South East Asia. It is coordinated in the Philippines by the Philippine Council for Agriculture, Forestry and Natural Resources Research and Development, the focal agency of the national agricultural research system. The project identifies effective technologies to control parasites in goats and

sheep and is developing the best ways to modify the technologies using teams and groups in which farmers, scientists and extension workers all participate.

The project now operates in five countries in the region: Cambodia, Indonesia, Laos, the Philippines and Vietnam.

The farmers involved in the project are typical of the region, making most of their living from crops such as rice, mango and coconut, or from fishing. Livestock are usually secondary enterprises but can provide up to half the income for a household.

A closely related participatory project in South East Asia is the Crop-Animal Systems Research Network (CASREN), which aims to sustainably improve the integration of crop and livestock production by making better use of nutrients. Five countries are involved: China, Indonesia, the Philippines, Thailand and Vietnam, with significant support from the Asian Development Bank. The approach of CASREN is also to develop a basket of options with farmer-partners, with a focus on making better use of feeds for livestock and manure as a crop fertiliser, and use of legumes and other strategies to increase soil fertility. There are two major links between SPC and CASREN efforts. First, nutrition has a big impact on resistance to disease, and parasites reduce the efficiency of feed use. Second, the participatory approaches being used by the projects are similar and have led to a deeper understanding of how and why these technologies are adopted by farmers.

The project on sustainable parasite control grew out of the conviction that productivity of small ruminants in the livestock sector could be increased by focusing on the problems caused by **intestinal worms** in small

Integrating several approaches: chemicals, nutrition, genetics and management, could offer the most sustainable increase in productivity for farmers. A basket of options has been jointly developed with farmer-partners that include strategic deworming, use of medicated feed blocks, use of tree and shrub leaves as feeds, complete confinement during the wet season, rapid rotational grazing, improved housing and controlled breeding. Farmers choose the options that are convincing and suitable to their circumstances. They monitor and report their observations, evaluate them with project specialists, and then select the best options for the future.

An indicator for the importance of the project and the suitability of the approach has been the strong buy-in from state departments who are interested in using the research outcomes in their own programmes. The investment of many national partners in the project provides useful feedback to ILRI about the relevance of its work and, most importantly, ensures sustainability of the research effort.

The first results are encouraging. The farmer-partners are highly motivated and engaged in the research and report reduced kid mortality, which has been the major problem in goat production. On a different level, the project has become a springboard for other projects, which can use both the technologies and the participatory approach to develop extension programmes.

rumnants is tackled by Leyden Baker, geneticist at ILRI, Nairobi, from a rather different angle. Starting with the observation that indigenous Red Maasai sheep in Kenya are highly resistant to intestinal worms, Baker developed test populations by crossing the resistant Red Maasai sheep with susceptible Dorpers, a sheep breed from South Africa. The crossbred populations were used to verify the genetic basis and susceptibility to worm infection in a quantitative way.

Ultimately, the aim is to use the genetic information to develop new breeding strategies to improve worm resistance and productivity in sheep.

This would reduce the dependence of smallholders on deworming drugs, which are becoming less effective due to the development of resistances by the parasites. Alternative worm control through controlled grazing has limited scope in the African savannah or the Central Asian rangelands. Improved breeds could hold a solution to this perpetual constraint to livestock productivity.



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Improving crop–livestock systems in the dry savannahs of West Africa



In Mali, farmers from the village of Wolodo visit their neighbours in Zanguena to discuss with scientists their views of the livestock feeding options.

In West Africa, integrated crop–livestock systems promise the highest potential for sustainable productivity increases and are predicted to become the dominant farming systems, on which well over 50% of West Africa's vast population will depend during the next five decades. ILRI, IITA (the International Institute of Tropical Agriculture), ICRISAT (the International Crops Research Institute for the Semi-Arid Tropics), national research partners and other institutions have combined their complementary expertise in livestock feeding, manure management, improved crop varieties and agronomic management as it relates to the region's farming systems.

In an integrated participatory approach used in Mali, Niger and Nigeria, each of the three institutes contributes their best-bet technologies for combined on-farm evaluation. IITA's improved cowpea varieties, ICRISAT's improved sorghum, and ILRI's expertise on livestock feeding and management in general, and nutrient cycling in particular, come together as one integrated set of options. Assessing the economic benefit of the options in this form follows what farmers do all the time: evaluate benefits and trade-offs when faced with choices of investments.

Farmers' options in each of the three countries have differed in relation to the farmers' circumstances and priorities. In Niger, strategies include the use of the improved fodder, especially cowpea, to maximum effect for animal production. When starting with a poor-quality basal diet (which is all that is available to most farmers), low levels of cowpea supplementation resulted in doubled animal weight gain. Participating farmers are very impressed with this strategy because it means that they can now fatten more sheep especially for religious festivals by using a small amount of cowpea fodder each day as opposed to their previous ad hoc strategy, which meant the fodder supply would be quickly exhausted. Another implication is the increased availability of manure that can be returned to the land – a vital input to maintain soil fertility.

Results from Nigeria indicate that with improved dual-purpose sorghum and cowpea varieties, judicious input use and crop management, livestock feeding and manure management, farmers can increase grain and fodder yields for cereals and grain legumes, and there is a potential to increase livestock production in terms of both live-weight gain and manure output. Furthermore, the strategy of confining animals for better feeding and manure collection has been so successful that many farmers have reinforced their animal shelters so they can be used all year round to the benefit of nutrient cycling.



In Nigeria, farmers have reinforced the locally made pens for their animals so they can be confined and fed on a year-round basis. Such more intensive management suggests a greater market orientation – but it also ensures more manure is collected to go back onto the crop fields.

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Participatory research

A two-way street

In West Africa as in South East Asia, participatory research fulfils two important functions. It is hugely important, if not essential, for researchers to continuously check that their work is still on track. The input of farmer-partners helps evaluate tools and technologies, and gives direction for future research. The continuous give and take in participatory research projects means that research is regularly updated to keep its focus, and that farmers experience minimal delay in access to new farming technologies that can make all the difference when living on the edge.



But more than anything else, it puts into the centre of attention the people for whom livestock research matters most. Women who pay the school fees of their children from the cash income that their one dairy cow provides. Children who cannot grow up believing in the future and their own chances if they see their family's business ruined through one epidemic of livestock disease. Farmers who work hard to escape poverty and who deserve to see the fruits of their labour grow and thrive.

publications in 1961.....

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Financial statements

Statement of activities for the year ended 31 December 2001

Currency – US\$,000	Unrestricted	Temporarily restricted	Total 2001	Total 2000
Revenue				
Grants	11,820	12,935	24,755	23,316
Other revenue	1,593	–	1,593	1,783
				25,099
Expenses				
Programme-related expenses	9,123	12,935	22,058	20,455
Management and general expenses	6,980	–	6,980	6,450
Other expenses and losses	62	–	62	189
Indirect cost recovery	(692)	–	(692)	(411)
				26,683
				(1,584)
				31,333
				29,749



Statement of financial position as at 31 December 2001

Currency – US\$,000	2001	2000
Assets		
Current assets		
Cash and cash equivalents	7,752	10,349
Accounts receivable		
Donors	6,940	4,724
Employees	167	636
Others	875	1,188
Inventories	1,224	1,378
Prepaid expenses	171	235
Non-current assets		
Property and equipment, net	16,272	17,303
Intangible assets, net	203	361
Investment in subsidiary	1,816	1,816
Liabilities and net assets		
Current liabilities		
Accounts payable		
Donors	2,864	1,863
Employees	1,350	1,803
Others	893	1,506
Accruals	1,695	2,229
Funds in trust	369	339
Non-current liabilities		
Accounts payable		
employees	560	501
Net assets		
Unrestricted		
appropriated	18,835	20,013
unappropriated	8,854	9,736
TOTAL LIABILITIES AND NET ASSETS	35,420	37,990

Investors in 2001

Investor Governments	Currency – US\$,000		
	Unrestricted	Restricted	Total
Australia	172	247	419
Austria	175		175
Belguim	133	89	222
Brazil	8		8
Canada	699	3	702
China, People's Republic	20		20
Denmark	535	78	613
European Union		2,238	2,238
Finland	283	85	368
France		605	605
Germany	188	116	304
India	37		37
Ireland	496		496
Italy	403	191	594
Japan	416	796	1,212
Kenya		113	113
Korea		16	16
Luxemburg		6	6
Netherlands	160	77	237
Nigeria		9	9
Norway	933	214	1,147
South Africa		50	50
Spain		40	40
Sweden	748	18	766
Switzerland	814	492	1,306
United Kingdom		3,380	3,380
United States of America	2,950	54	3,004
Sub-total governments	8,170		

Agencies and organisations

Asian Development Bank	448	448
FAO	52	52
Ford Foundation	1,000	1,000
GEF	160	160
IAEA	26	26
IDRC	105	105
IFAD	911	911
Leverhulme Trust	53	53
OPEC	70	70

Investor	Currency – US\$,000		
	Unrestricted	Restricted	Total
Rockefeller Foundation		121	121
WOTRO		13	13
USNSF		8	8
USDA		10	10
World Bank	2,650		2,650
WHO		5	5
Others		158	158
Sub-total agencies and organisations	2,650	3,140	5,790
CGIAR intercentre initiatives			
PRGA-CIAT		8	8
SGRP-IPGRI		10	10
G&D-ICRAF		5	5
CAPRI-IFPRI		108	108
Non CGIAR organisations contracting ILRI			
CTA		2	2
CFC		63	63
GL-CRSP			
- Colorado State University		12	12
- Texas A&M University		142	142
ICMB		30	30
OAU/IBAR		101	101
OADB		73	73
Princeton University		2	2
University of Liverpool		91	91
University of Nottingham		5	5
University of Warwick		1	1
Utah State University		225	225
Sub-total non CGIAR organisations		747	747

Research grants

Investor		
Project title	Project coordinator	Value (USD)
Agip		
Intergration of small ruminants into smallholder farming systems of oil-producing areas of south-east Nigeria	Tim Williams	325,097
Belgium		
Control of vector-borne diseases in livestock through development of improved vaccines and diagnostic tools	Phelix Majiwa	111,296
CAPRI		
Integrated resource management	Simeon Ehui	125,000
Enhancing the role of community actions in disease control and natural resource management	John McDermott	125,000
CFC		
Markets and regional trade in livestock in West Africa	Tim Williams	367,460
CIAT		
Assessment of the impacts of stakeholder participation in the diffusion of a Vertisol management technology in highland Ethiopia	Don Peden	36,000
ICRAF		
Gender and diversity programme	Susan Dewey	35,000
CSU		
Environmental toolbox	Philip Thornton	73,000
Integrated modelling and assessment of balancing food security, conservation and ecosystem integrity	Philip Thornton Robin Reid	15,000
CTA		
Seminar on sustainable crop livestock production for improved livelihoods and natural resource management in West Africa	Tim Williams	38,095
Danida		
Examining efficiency of smallholder dairy in Uganda	Dannie Romney Steve Staal	478,500
DFID		
Assessment of diversity of the genetic resources in goats and sheep in sub-Saharan Africa	Ed Rege	159,731
Development of sub-unit vaccine against East Coast fever in cattle, using a novel prime boost immunization strategy	Evans Taracha	157,360
Genetic enhancement of feed quality and quantity of sorghum and millet	Michael Blumell S.Fernandez-Rivera	288,000
Research and development support to smallholder dairy sector	Steve Staal	2,750,718
Development of seasonal nutritional and resource management strategies for smallholder dairy systems	Steve Staal Simeon Ehui	64,021
Market mechanisms and public health risks in developing peri-urban markets - Ghana project	Steve Staal	426,506
The implication of disease in maize production in smallholder dairy farms and the utilisation of maize as food and fodder	Steve Staal	118,993



Investor		
Project title	Project coordinator	Value (USD)
Talking pictures: feeding decision support systems	Steve Staal	35,268
Crop-livestock modelling and minimum data set feeding strategies	Steve Staal	136,352
Manure management – collection, storage and compositing strategies to enhance organic fertiliser quality	Steve Staal	263,003
Identifying priority areas for international animal disease research	Brian Perry	128,700
Mapping poverty and livestock	Philip Thornton	97,200
Feeds and nutrition workshops	S.Fernandez-Rivera	42,918
Development of farm field school methodology for smallholder dairy	Bruno Minjauw	428,768
Cowdria in tick cell lines – heartwater	Subhash Morzaria	32,189
Feed and nutrition workshops	Jean Hanson	35,765
East Coast fever vaccines	Evans Taracha	5,323,680
Epidemiological and economic evaluation of cross-border disease control in southern Africa (foot-and-mouth disease)	Brian Perry	70,813
Animal health research for poverty alleviation	Brian Perry	118,080
EDF		
Programme Concerte de Recherche – developpment sur l'élevage en Africa de l'ouest	Kamuanga Mulumba	482,390
FAO		
Breed surveys (animal genetic resources conservation)	Ed Rege	40,000
FAO GIS databases on livestock distribution	Philip Thornton	20,000
Contribution of small-scale farming to rural off-farm employment	Steve Staal Simeon Ehui	5,000
Farm power and implements for sustainable livelihoods – workshops	Habib Ibrahim	40,000
Food safety	Steve Staal	20,000
Finland		
Associate expert GIS (Juho-Ville Vuorio)	Philip Thornton	182,200
CIRAD/EU		
Anti-disease approach for immunological control of livestock trypanosomosis	Edith Authie	*
UNEP-GEF		
Land-use change analysis as an approach for investigating biodiversity loss and land degradation	Robin Reid Joseph Maitima	771,000
GTZ		
Development and application of genetic markers to bovine type genes	John Gibson Olivier Hanotte	250,000
Animal genetic resources conservation	Ed Rege	170,430
IAEA		
Environmental impact assessment of control of tsetse fly using SIT in the south Rift Valley of Ethiopia	John McDermott	82,016

* Varies annually based on agreements.

Investor		
Project title	Project coordinator	Value (USD)
ICMB		
Malaria pathogenesis	Fuad Iraqi	*
IDRC		
Epidemiology and disease control – sleeping sickness, Uganda	John McDermott	98,934
Programme to improve crop–livestock productivity through efficient nutrient management in mixed farming systems of semi-arid West Africa	Tim Williams	360,565
Enhanced human well-being through livestock and natural resource management (East African highlands)	Don Peden	301,730
IFAD		
Development and testing of an integrated approach to the control of gastro-intestinal parasites in small ruminants in South and South East Asia	Leyden Baker Doug Gray	875,000
Impact of Immunization with an improved sub-unit vaccine against East Coast fever on the smallholder dairy sector in Central Province of Kenya	Tom Randolph	600,000
Programme to improve crop livestock productivity through efficient nutrient management in mixed farming systems of semi-arid West Africa	Tim Williams	600,000
An integrated approach to assessment of trypanosomosis control technologies and impacts, agricultural production, human welfare and natural resources in tsetse-infected areas of Africa	Robin Reid	919,000
An integrated approach to the assessment of trypanosomosis control technologies and their impact on agricultural production, human welfare and natural resources in tsetse-affected areas of Africa	Tom Randolph	44,000
INIA-Spain		
CFC-CA enhancing beef productivity, quality, safety and trade in Central America	Steve Staal	75,000
IPGRI		
Forages and animal genetic resources	Jean Hanson	29,000
ISNAR		
Systems prototyping and impact assessment for sustainable alternatives in mixed farming systems in high-potential areas (ILRI-KARI-WAU)	Philip Thornton	370,850
Japan		
Trypanosoma evansi immunology	Honda Yoshikazu	45,000
Kenya		
EU/KARI backstopping and services funds – plant genetic resources	Jean Hanson	*
EU/KARI backstopping and service funds – GIS	Philip Thornton	*
EU/KARI backstopping and services funds for animal genetic resources	Ed Rege	*
Leverhulme Trust		
Isolation of genes encoding secretory pathway proteins of tick salivary glands	Richard Bishop	137,156

* Varies annually based on agreements.

Investor		
Project title	Project coordinator	Value (USD)
Michigan State University		
Climate and land-use workshop of East Africa	Philip Thornton	2,800
Netherlands		
Policies for sustainable land management in the East African highlands – Phase II (ILRI-IFPRI)	Simeon Ehui	42,196
Norway		
Policies for sustainable land management in mixed crop–livestock systems in the highlands of East Africa	Simeon Ehui	468,471
Genetic resources	Ed Rege	*
OADB		
Characterisation of indigenous ruminant livestock population in Oromia Regional State of Ethiopia	Ed Rege	77,558
OAU		
Promoting sustainable delivery of trypanosomosis control technologies in East Africa under the FITCA project	David Hall	64,276
OAU/IBAR		
Environment monitoring and management component	Robin Reid	673,624
Bourzat training workshops on GIS databases	Robin Reid	40,352
The Organization Change Programme		
Virtual system-wide livestock programme	Normand Demers	10,000
OPEC Fund for Development		
Under–nutrition of ruminant livestock in smallholder crop–livestock farming	Salvador Fernandez-Rivera	70,000
Princeton University		
Collaborative research with Princeton University	Robin Reid	3,000
Rockefeller Foundation		
Spatially referenced crop and livestock production database for eastern and southern Africa (poverty mapping)	Philip Thornton	135,000
A spatial database on poverty for East Africa	Philip Thornton	160,000
Workshop on enhancement of capacity in applied biometry in east and southern Africa	John Rowlands	28,428
International conference on sustainable crop–livestock production systems in sub-Saharan Africa		20,000
Switzerland		
Policies for sustainable land management in mixed crop–livestock systems in the highlands of East Africa	Simeon Ehui	783,060
Associate experts – smallholder dairy	Steve Staal	290,228
Associate expert – agricultural economist, West Africa	Tim Williams	183,086
SLP		
Transregional analysis of small holderdairy sector	Steve Staal	183,000

* Varies annually based on agreements.

Investor		
Project title	Project coordinator	Value (USD)
Sasakawa Global 2000		
Evaluation of quality protein maize plants as feed for ruminant livestock	Salvador Fernandez-Rivera	27,000
Sweden		
Anthelmintic properties of ethnoveterinary preparations used by smallholder farmers to treat internal parasites of their livestock	Leyden Baker	*
UNDP		
Italian associate expert	Giulia Conchedda	177,632
University of Nairobi		
Drug testing against theileria	Tony Musoke	1,393
University of Nottingham		
Mapping genes for resistance to gastro-intestinal nematodes – phase II	Leyden Baker	376,019
USAID		
Livestock crisis mitigation	Jean Ndikumana	100,000
Collaborative linkages – animal health services	Subhash Morzaria	48,000
USDA		
Microbial genomics research	Subhash Morzaria	50,000
Development of diagnostic tests for Babesia bovis	Subhash Morzaria	10,000
USNSF		
Strengthening Africa – US linkages for conservation biology	Robin Reid	10,278

* Varies annually based on agreements.



Training at ILRI

Training is a crucial part of ILRI's work. Training makes sure that the knowledge and expertise gained through ILRI's research will have a lasting effect.

Training at ILRI comes in two main forms:

Uncounted workshops in all forms and sizes bring together researchers and stakeholders, enabling the exchange of information that stakeholders need to make informed decisions and that scientists need to make relevant research.

The second form is the training of graduate students from all over the world for whom working at ILRI is a unique opportunity to train at the forefront of science, in an environment that knows and recognises the problems of the poor at the same time.

In 2001, ILRI had 30 graduate fellows, coming predominantly from Kenya, Uganda and Zambia, but also from China, Switzerland and the USA.

Two graduate fellows worked towards an MSc degree, the others towards their PhD with Universities in Kenya, South Africa, Uganda, China, the Netherlands, Sweden, Switzerland and the USA.



Alexander Kahi is congratulated by Ian Johnson, CGIAR chairman.

Alexander Kigunzu Kahi won the 2001 Promising Young Scientist Award of the CGIAR for his work as a graduate fellow with ILRI and the University of Hohenheim, Germany.

Alexander Kahi was sent in 1993 as a graduate fellow to ILRI by Egerton University, Kenya. He earned his MSc degree, under the supervision of Leyden Baker and Bill Thorpe, so well that he gained a DAAD fellowship to join the PhD programme at the Faculty of Agriculture, Hohenheim University, in Germany. His supervisor in Hohenheim, Prof. Gall, considers him one of the best PhD students he has ever supervised.

His research on smallholder dairy systems combines genetic and economic analyses and simulation models to assess alternative options in livestock crossbreeding, including optimised breeding strategies for smallholders.

Alex Kahi knows the economics of smallholder farming first hand. Born and raised on a crop-and-livestock farm in Kenya's western highlands, where the population density is among the highest in the world and 95% of the population live below the poverty line of US\$1 a day, Alex Kahi's description of his home is a synopsis of the African smallholder perspective: 'We were a very small family, just six children, but we had a big farm – at least five acres.'

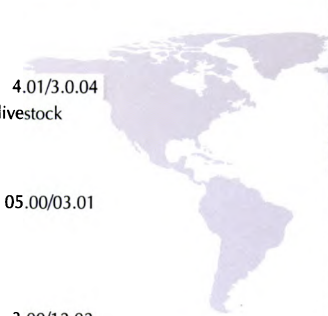
Alex Kahi represents the first generation in his family to obtain university education, and he has done them proud.

For more information on ILRI's graduate programme, contact v.adell@cgiar.org

Graduate fellows in 2001

	nationality	degree	supervisor	registered	field	support	start/end
Bebe Bockline	Kenya	PhD	Thorpe	Wageningen	Dairy	WOTRO	4.99/3.02
	Herd dynamics of smallholder dairy in the Kenya highlands						
Githiori John	Kenya	PhD	Baker	Uppsala	Helminths	Sida	7.99/5.04–4.99/3.02
	Anthelmintic properties of ethnoveterinary preparations used by smallholder farmers to treat internal parasites of their livestock						
Jirimo Adan	Kenya	MSc	Graham	Nairobi	Immunology		08.01/07.02
	Evaluation of bovine dendritic cells in the induction of cytotoxic T lymphocyte responses to <i>Theileria parva</i>						
Kamau Lucy	Kenya	PhD	Musoke/Bishop	Kenyatta	Immunology	DAAD	4.00/3.02
	Isolation and characterisation of genes encoding candidate vaccine antigens from <i>Rhipicephalus appendiculatus</i>						
Kanga Simon	Kenya	PhD	Hanotte	Kenyatta	Genetics		7.98/12.01
	Development and application of genetic markers linked to bovine trypanotolerance genes						
Koskey Isaac	Kenya	PhD	Baker	Wageningen	Genetics	WOTRO	3.00/2.04
	Breeding objectives and breeding strategies for small ruminants in the tropics						
Lukuyu Bernard	Kenya	PhD	Romney	KARI	Animal health	DFID	9.01/8.03
	Strategies for feeding smallholder dairy cattle in the intensive maize forage production systems and implications for integrated pest management						
Machila-Eisler Noreen	Zambia	PhD	McDermott	Edinburgh	Epidemiology	DFID	1.00/12.02
	Tools to improve targeting of drugs for African bovine trypanosomiasis						
Makokha Stella	Kenya	PhD	Staal	Nairobi	Socio-economics	SDP	1.01/12.03
	Household and spatial analysis of factors limiting dairy development in Western Kenya						
McOdimba Francis	Kenya	PhD	Majiwa	Edinburgh	Molecular epidemiology		10.01/9.04
	Characterisation of field isolates of <i>Trypanosoma brucei</i>						
Menge David	Kenya	PhD	Iraqi	JKUAT	Molecular genetics	Wellcome	1.00/12.02
	Genetic mapping of quantitative trait loci (QTLs) controlling resistance to gastro-intestinal (GI) nematodes in a mouse model						
Mubiru Sarah	Uganda	PhD	Romney	Makerere	Soil science	Danida	5.01/4.04
	Nutrient management and efficiency of production under intensification of smallholder dairying in Uganda						
Mugasi Sam	Uganda	PhD	McDermott	Makerere	Economics		6.00/9.02
	Community actions in disease control and natural resource management: economic issues						
Muigai Anne	Kenya	PhD	Hanotte	JKUAT	Genetics		8.98/12.01
	Genetic diversity of sheep populations in sub-Saharan Africa						
Mulinge Wellington	Kenya	PhD	Thorpe/Staal	Nairobi	Dairy		01.98/03.01
	Identifying the determinants of competitiveness in intensifying dairy systems in highland Kenya						
Musoke Winnie	Uganda	PhD	McDermott	Makerere	Sociology	IDRC	6.00/9.02
	Community assessment of sleeping sickness in Uganda						

	nationality	degree	supervisor	registered	field	support	start/end
Nanyeenya William	Uganda	PhD	Romney/Staal	Makerere	Soil science	Danida	5.01/4.04
	Efficiency of production under intensification of smallholder dairying in Uganda						
Ndungu Leah	Kenya	PhD	Randolph	Pretoria	Epidemiology		/12.01
	Socio-economic, infrastructural and policy constraints to the delivery and adoption of vaccines for the control of tick-borne diseases						
Ng'ang'a Joseph	Kenya	PhD	Iraqi	JKUAT	Molecular genetics	Wellcome	3.00/2.03
	Positional cloning of trypanosomosis resistance QTL, Tir1, 2 & 3, in the mouse. This project is part of an ILRI-University of Liverpool collaboration funded by the Wellcome Trust						
Odiit Martin	Uganda	PhD	McDermott	Edinburgh	Epidemiology	DFID	4.01/3.04
	Rhodesienses sleeping sickness in Uganda; special and temporal risk factors and impact of potential control and treatment options						
Odongo David	Kenya	PhD	Bishop	Brunel	Molecular genetics	IFAD	10.00/9.03
	Assessing the carrier state prevalence and the genetic diversity of Theileria parva in contrasting production systems in Kenya.						
Ouma Emily	Kenya	MSC	Staal	Egerton	Economics		8.01/7.02
	Livestock's contribution to phosphorus cycling: small-scale mixed farming set-up in the central highlands of Kenya						
Salasya Beatrice	Kenya	PhD	Thornton	Wageningen	Agricultural economics		8.00/7.04
	System prototyping and impact assessment for sustainable alternatives in mixed farming systems in high-potential areas of eastern Africa						
Smucker Tom	Kenya	PhD	Thornton	Michigan	Policy		8.00/7.03
	Land-use change and wildlife conservation in Kajiado District, Kenya, as part of the integrated modelling and assessment programme in East Africa						
Thuranira Christine	Zambia	PhD	McDermott	Edinburgh	Epidemiology		4.01/3.0.04
	Socio-economic factors influencing productivity and uptake of veterinary services in mixed crop-livestock farming systems in tsetse-infested areas of Kenya						
Utiger Christa	Switzerland	PhD	Romney	ETH Zurich	Dairy		05.00/03.01
	Nutrient cycling and nutrient balance analyses in intensive and semi-intensive tropical maize-dairy production systems						
Wangeci Rosemary	Kenya	PhD	Rowlands	Limburgs	Biometrics		3.00/12.02
	The frailty model in animal breeding research						
Wangui Edna	Kenya	PhD	Reid	Michigan	Ecology		
	Links between land use and gendered access to resources on the ecological gradient of Mount Kilimanjaro, Kenya						
Worden Jeff	USA	PhD	Reid	Colorado	Ecology	CSU	9.99/9.02
	Maasai settlement, landscape mosaics, and the spatial patterning of vegetation and wildlife in East African savannahs						
Xuebin Q	China	PhD	Rege	Lanzhou	Genetics		2.01/1.04
	Assessment of the genetic diversity in wild and domestic yak populations of Asia using microsatellite DNA markers						





Senior programme and support staff

Directors

Hank Fitzhugh

director general

Bruce Scott

director of corporate services

Carlos Seré

director general (joined on 1 January 2002)

David W Taylor

deputy director general

Ralph von Kaufmann

director of external relations

Research and senior administrative staff

Nairobi-based staff

Idris Abdullahi[†]

accounting officer

Joan Abila

assistant to director of external relations

Joseph Alaro[†]

treasury accountant

William Anyika

head, engineering

Samuel Asura[†]

database specialist

Edith Authié

cellular immunologist ^{vs1}

Elias Awino

research technician

Leyden Baker

quantitative geneticist

Isabelle Baltenweck

agricultural economist ^{pd}

Richard Bishop

molecular parasitologist

Gro Bjørnstad[†]

geneticist ^{avs2}

Alain Boulangé

immunologist ^{vs1}

Daniel Bourzat[†]

agronomist, ^{vs1}

Francis Chuma

research technician

Susan Dewey[†]

human resources manager

Tineke de Wolff

geographer ^{avs3}

Guy d'Ieteren

animal scientist

Simeon Ehui

agricultural economist, programme coordinator

Rob Eley^{*}

education officer

Dave Elsworth^{*}

head, graphics unit

Getachew Engida

chief financial officer

Salvador Fernandez-Rivera

animal scientist, programme coordinator

James Gachanja

research technician

Henrie Gathuo

research technician

John Gibson

geneticist, programme coordinator

David Gichure

head chef

Simon Graham

immunologist ^{pd}

David Hall[†]

agricultural economist

Olivier Hanotte

molecular biologist

Mario Herrero

livestock modeller

Christopher Hinson

head, administration

Yoshikazu Honda

molecular immunologist

Christian Ikeobi[†]
animal breeder/geneticist ^{pd}

Fuad Iraqi
molecular geneticist

Ramni Jamnadass[†]
molecular biologist

Han Jianlin[†]
geneticist ^{pd}

John Kabata
research technician

Robert Kaitho
research officer

Grace Kamau
librarian

Roger Kamidi
data analyst

Edward Karira^{*}
communications supervisor

Joseph Katende
protozoologist diagnostician

David Kennedy
veterinarian

Henry Kiara
research officer

Gerold Kierstein[†]
animal geneticist, ^{pd4}

Kamau Kimani
research technician

Bob King
head, experimental animal units

Charles Kinyanjui
food and beverage controller

David Kinyanjui
chief security officer

Bernard Kirgotty
food services supervisor

Sylvester Kisonzo
computer software officer

Luka Juma Kiundi
research technician

Patti Kristjanson
agricultural economist

Russ Kruska
geographic information systems specialist

Tumuluru Kumar [†]
budget and project administration officer

Bronwen Lambson
molecular biologist ^{pd5}

Sahr Lebbie
coordinator, SADC animal agriculture
research network (S-AARNET)

Thierry Lefrancois
biologist ^{vs1}

Helen Leitch
manager, funding support systems

Marjan Leneman
veterinary epidemiology and social economics ^{avs3}

Eunice Lenkoina
liaison and protocol officer

Clement Lugonzo
research technician

Niall MacHugh^{*}
cellular immunologist

Susan MacMillan
head, public awareness

James Magundu
head, fluorescence-activated cell sorter services

Jackson Makau
research technician

Mary Maina
research technician

Phelix Majiwa
molecular biologist

Faith Matee
purchasing officer

Crispin Matere
research technician

Joseph Matere
research technician

Simon Mbugua
human resources officer

David Mburu
research officer

John Mburu
research technician

Ferdinand Mbwika
research technician

Nancy McCarthy
agricultural economist⁶

John McDermott
epidemiologist

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Ezekiel arap Meli^{*}
farm manager

Bea Mertens^{*}
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Bruno Minjauw[†]
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Margaret Morehouse^{*}
human resources manager

Subhash Morzaria
molecular parasitologist, programme coordinator

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research technician

Peter Muema
housekeeper

John Mugambi
helminthologist

Paul Muiya
research technician

Maria Mulindi
administrative assistant to director general

Cecilia Muriuki
research technician

Noel Murphy*
molecular geneticist

Tony Musoke
immunologist

David Muteti
research technician

Anthony Muthiani
research technician

Joshua Mutua†
financial systems officer

Joel Mwakaya
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Duncan Mwangi
cellular immunologist^{vs1}

Stephen Mwaura
research technician

Jan Naessens
immunologist

Sonal Nagda
statistical computer programmer

David Ndegwa
research technician

Rose Ndegwa
intellectual property officer

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Vish Nene*
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John Ngatti
stores superintendent

Daniel Ngugi
research technician

John Ngugi
head driver

Liston Njoroge
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Timothy Njoroge
research technician

David Njubi
senior computer programmer

Catherine Nkonge
immunologist

Joseph Nthale
research technician

Meshack Nyabenge
research technician

John Nyanjui
research technician

Andrew Odero
research technician

George Ogoti†
network administrator

Veyrl Adell Okiro†
administrative officer – training

Ignatius Okumu
research technician

Amos Omore
research officer

Julius Osaso
research technician

Janepher Owino
housing officer

Pratibala Pandit
research technician

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Brian Perry
epidemiologist

Jacob Quaye*
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Robin Reid
landscape ecologist, programme coordinator

Tim Robinson
decision support modeller

Deborah Romney
ruminant nutritionist

John Rowlands
biometrician

Sam Sawe
transport officer

Rosemary Saya
research technician

Rob Skilton
molecular parasitologist

Bo Soderstrom†
ecologist⁸



Paul Spooner
tissue culturist

Steve Staal
agricultural economist

Evans Taracha
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Kathy Taylor*
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Veronica Waiyaki
human resources officer

John Wambugu
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Stephen Wanyonyi
research technician

David Wanzala
building and grounds supervisor

Delia Wasawo
research technician

Clive Wells*
head, electron microscopy services

Peter Werehire
webmaster

Ethiopia-based staff

Abate Tedla
forage seed production officer

Abebe Mesgina
senior research assistant

Abebe Tessema
research assistant

Abenet Gebrehana*
chief cook/catering supervisor

Abiye Astatke
agricultural engineer

Abraham Bekele
head, computer services

Abu Tilaye
transport pool head

Ali Ahmed
senior typesetter/designer

Ameha Berhanu†
maintenance engineer

Anteneh Getachew
purchasing supervisor

Antonio Silla
internal auditor

Asfaw Yemegnuhal
senior research technician

Asmelash Werede*
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Ayenew Mequanent
senior purchaser

Aynalem Tesfahun
computer programmer

Azage Tegegne
debre zeit station manager

Azeb Abraham
librarian

Bekelu Shiferaw
accounting officer

Belayhun Wondimu*
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Benin, Samuel
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Berhanu Gebremedhin
agricultural economist ^{pd}

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Birru Dori†
webmaster

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agricultural economist ^{vs1}

Brown, Dan†
nutritionist¹¹

Conchedda, Giulia*
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Demers, Normand
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Drucker, Adam†
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Elias Mulugeta
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assistant to SPLR programme coordinator

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budget officer

Enyew Negussie*
research officer

Ephrem Getahun
systems specialist

Eshetu Woldekidan
financial systems support

Franco Leone*
physical plant manager

Gebreselassie Mulatu
chief electrician

Gemechu Degefa
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Genet Asefa
research assistant

Getachew Bulfeta
database manager

Girma Tadesse
research officer

Hanna Zerfu
senior accountant

Hanson, Jean
plant geneticist

Kahsay Berhe
research assistant

Kebede Alemu
security officer

Kebede Seyoum
lan administrator

Likyelesh Feke
supervisor, communications

Mamadou Diedhiou
biometrician

Mamo Hundie
senior group leader

McCrabb, Graeme†
ruminant nutritionist

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chief mechanic

Mekuria Lemma
senior store man/insurance assistant

Meskele Berhan Mengesha
senior accountant

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housing and catering officer

Mohamed Ahmed
agricultural economist

Mohamed El-Habib Ibrahim
training materials specialist

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head nurse

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Tall, Aguibou
head, administration

Tena Reta
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Tesfaye Admassie†
systems specialist

Tesfaye Jemaneh
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Tirsit Debebe
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Workneh Ayalew†
research officer

Worku Adera
chief electronics technician

Woudyalew Mulatu
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research technologist

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Yilma Jobre Makonnen[†]
training programme officer

Zelalem Meaza[†]
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applied biometrician

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agricultural economist

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agro-ecologist, china liaison scientist

Colombia

Federico Holmann
agricultural economist¹³

India

Michael Blummelt[†]
ruminant nutritionist

Malaysia

Canagasaby Devendra
animal nutritionist

Nigeria

Pierre Hiernaux
ecologist

Asmoah Larbi
forage agronomist

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agronomist¹⁵

Timothy Williams
agricultural economist, project manager

Peru

Carlos Leon-Velarde
animal production systems specialist¹⁶

Philippines

Douglas Gray
animal scientist, regional coordinator

Lucila Lapar
economist

Danilo Pezo
animal nutritionist

Notes

This list includes all internationally recruited staff, visiting scientists, associate professional officers, seconded staff and senior nationally recruited staff groups.

- * left in 2001
- † joined in 2001
- pd postdoctoral scientist
- vs visiting scientist
- avs associate visiting scientist
- 1 seconded by CIRAD-EMVT (Centre de Coopération internationale en recherche agronomique pour développement – élevage et médecine vétérinaire de pays tropicaux), France
- 2 seconded associate scientist through the Government of Norway
- 3 seconded associate scientist under the associate professional officers scheme through the Government of the Netherlands
- 4 seconded postdoctoral scientist funded by the Government of Germany
- 5 funded by the University of Edinburgh, UK
- 6 joint appointment with IFPRI (International Food Policy Research Institute)
- 7 seconded by VVOB (Vlaamse Veringung Voor Ontwikkelingssamenwerking en Technische Bijstand), Belgium
- 8 funded by Sida (Swedish International Development Cooperation Agency)
- 9 funded by the Government of Japan
- 10 seconded associate scientist through the Government of Finland
- 11 seconded scientist from Cornell University
- 12 seconded associate scientist through the Government of Italy
- 13 50% joint appointment with CIAT (Centro Internacional de Agricultura Tropical)
- 14 seconded by SDC (Swiss Development Cooperation), Switzerland
- 15 50% joint appointment with IITA (International Institute of Tropical Agriculture)
- 16 50% joint appointee with CIP (Centro Internacional de la Papa)

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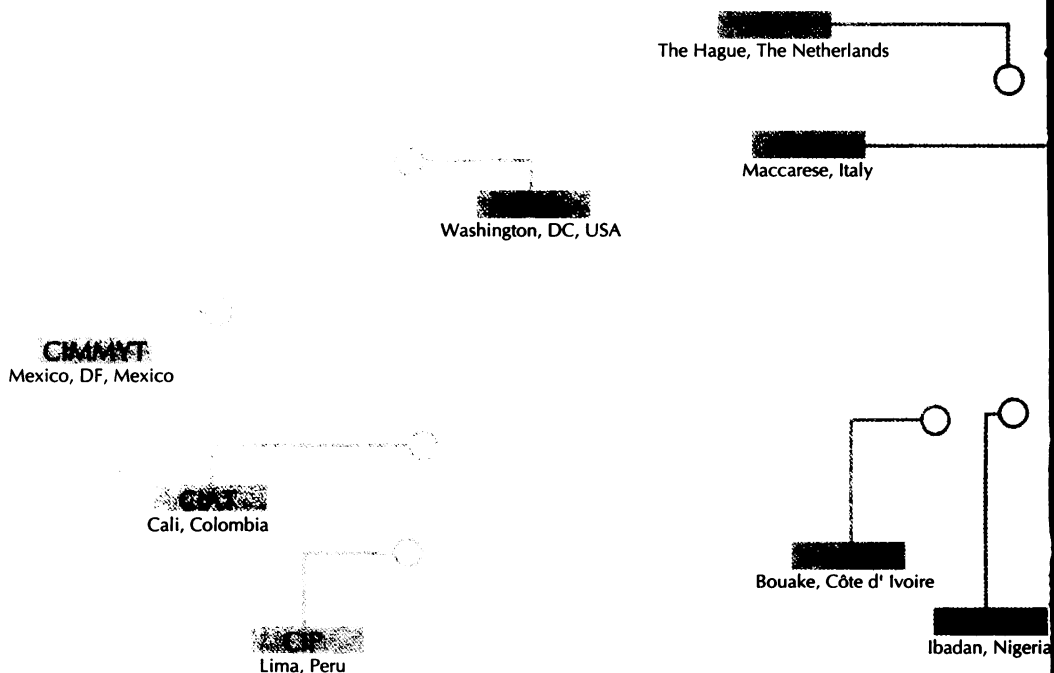
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The International Livestock Research Institute

(www.ilri.org) has a mandate to enhance the well-being of present and future generations in developing countries through research to improve sustainable livestock production. It works in partnerships and alliances with other organisations, national and international, in the fields of livestock research, training and information exchange. ILRI was formed in 1994. Its headquarters are in Nairobi, Kenya, with a second major campus in Addis Ababa, Ethiopia, and offices in six more countries around the world.



ILRI is one of 16 Future Harvest Centres FUTURE HARVEST (www.futureharvest.org), which conduct food and environmental research to help alleviate poverty and increase food security while protecting the natural resource base. The centres are funded by government agencies, development banks, private foundations, regional and international organisations, and are supported by the Consultative Group on International Agricultural Research (CGIAR).

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