



Investing in rural people

## Development of innovative integrated animal health packages for poor rural people

GRANT RESULTS SHEET



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The goal of this grant was to develop **holistic animal health packages** for the management and control of animal diseases

### Goals and objectives

Livestock contribute to the livelihoods of roughly 70 per cent of the world's poor people. The increasing demand for livestock products for the growing populations of developing countries, particularly in Africa, offers new market opportunities for poor farmers in rural areas. Success in raising smallholder productivity leads to improvements in household food security, nutrition and income. However, in vast areas of sub-Saharan Africa, animal production by smallholder farmers is greatly hampered by livestock diseases, in particular tick-borne diseases, tsetse-transmitted trypanosomiasis, gastrointestinal parasitism and other diseases caused by biting insects.

The goal of this IFAD grant to the Food and Agriculture Organization of the United Nations (FAO) was to develop holistic animal health packages for the management and control of animal disease constraints/risks in order to improve livestock production and increase opportunities for rural development, improved food security and poverty alleviation.

The main element of these packages was the Livestock Protective Fence (LPF), which was tested in three different agroecological zones on three different livestock production systems: small ruminants in Burkina Faso, pigs in Ghana and dairy cows in Kenya. The LPF is a net which is impregnated with Pyrethroid Deltamethrin, a safe and environmentally friendly insecticide. In Burkina Faso, LPFs were complemented by other interventions to control internal and external parasites. In addition to the three target countries, project activities also benefited other countries in which LPF adoption training was undertaken: Benin, Burundi, Côte d'Ivoire, Eritrea, Ethiopia, Liberia, Mali, Niger, Nigeria, Rwanda and Togo. A socio-economic and animal productivity study was carried out in each of the three target countries to evaluate the impact of the package. For Burkina Faso, the study also evaluated the interventions to control parasites.

The LPF is supplied by the private enterprise Vestergaard Frandsen (<http://www.vestergaard-frandsen.com>), and the commercial name is ZeroFly® Livestock.



## Facts at a glance

### Grant implementing agency

Food and Agriculture Organization of the United Nations (FAO)

### Theme

Innovative animal health packages

### Benefiting countries

Burkina Faso, Ghana, Kenya

### Total programme cost

US\$3,600,000

IFAD contribution: US\$1,600,000

Cofinancing (other donors):  
US\$2,000,000

### Partners

International Centre of Insect Physiology and Ecology (ICIPE), Centre International de Recherche-Développement sur l'Élevage en zone Subhumide (CIRDES), Pan African Tsetse and Trypanosomiasis Eradication Campaign (PATTEC) national offices, private sector entities

### Effectiveness and duration

July 2009 – March 2014; four years

### Linkages to IFAD investment projects

- Smallholder Dairy Commercialization Programme, Kenya
- Sustainable Rural Development Programme and Community Investment Project for Agricultural Fertility, Burkina Faso

## Beneficiaries

Direct beneficiaries were smallholder livestock keepers, farmers and their associations/organizations, and extension services. Indirect beneficiaries included national agricultural research systems (NARS), international and regional research institutions (e.g. CIRDES, Bobo Dioulasso, Burkina Faso; ICIPE, Nairobi, Kenya; and the national offices of PATTEC in Burkina Faso, Ghana and Kenya). Training involved 496 farmers (60 per cent women) in Kenya, 332 farmers (35 per cent women) in Ghana and 116 farmers in Burkina Faso. Additional training was provided to students and trainees from vocational schools, and officers from veterinary services. An international training course was also provided for 16 participants from West African countries.

The project proved relevant to IFAD's primary target group. In addition to family labour, dairy farming generates jobs in wage labour and mobile milk trading. The improved quality of milk production fosters market-driven development in the informal dairy industry, which works with poor smallholder dairy producers and traders to strengthen their capacity to respond to market opportunities.

## Main results

**In Kenya**, the development of animal health packages focused on the enhancement of milk productivity in areas where there is a shortage of grazing land, and zero grazing or semi-zero grazing takes place. LPFs were an essential component. The animal health package was developed using a participatory approach. The most significant results are as follows:

- Following the intervention, milk offtake steadily improved (20 per cent increase the year before last and 60 per cent during the last year of the project). LPFs had a positive effect on milk production, with an increase recorded for both LPF-protected and pit waste-protected units. In semi-grazing units, the increase in milk offtake was 40 per cent.
- Mastitis was also reduced in both LPF-protected and waste-protected units, although with more comprehensive results in the former. Stomoxys housefly and mosquito numbers were greatly reduced. There appears to be a positive correlation between the density of stomoxys and mastitis cases. In this study, the reduction in stomoxys was followed by a fall in mastitis cases.
- The reduction in mosquito numbers and the corresponding fall in malaria cases reported indicate that LPFs can have a significant impact on human health and contribute significantly to the One Health concept.
- The average economic benefit per farm household exceeded US\$2,600 per year.

**In Ghana**, prior to the project's intervention, communities had resorted to desperate measures (e.g. pouring engine oil on piglets) in an attempt to reduce pig mortality caused by disease in swine production, for the most part tsetse-transmitted trypanosomiasis. In the project intervention area, the challenge posed by tsetse flies was significant, with 100 flies caught per trap per day before the LPF intervention. Some of the results of using LPFs including the following:

- Two months after the deployment of LPFs, tsetse numbers had been reduced by more than 98 per cent, while animal health had improved. Trypanosomiasis prevalence in pigs fell from 30 per cent to zero within five months of the first use of LPF. Mortality in piglets fell by 80 per cent in a year. An evaluation showed that pigs in protected pigsties had a mean litter weight gain – from birth to weaning – which was around 10 kg higher. This was attributed mainly to the reduction in tsetse-transmitted

trypanosomiasis. In particular, pigs in protected pigsties showed a better overall productive performance than those that were unprotected.

- Farmers using LPF to protect their pigs sold six-week old piglets at twice the price obtained by farmers who did not use the technology (US\$30 compared with US\$15) owing to the better physical conditions of LPF-protected piglets.
- The cost of trypanocidal treatment was approximately 60 per cent lower for farmers who applied the LPF technology than for those who did not.
- The capacity of farmers to manage viable pig production units was strengthened as a result of the training they received from the project. Their ability to keep good records, prepare more nutritious pig feed and maintain adequate pigsty hygiene contributed to significant increases in production yields (up to 90 per cent increase in production compared with traditional systems).

**In Burkina Faso**, the animal health package included treatments for gastrointestinal parasites and ectoparasites, and vaccination against pasteurellosis in sheep and goats. The following results were achieved:

- Mortality decreased by 93 per cent
- Growth rate increased by 12 per cent
- Abortion rate fell by about 10 per cent

This resulted in a higher proportion (17 per cent) of animals sold to the market. Moreover, the improved growth rate and physical conditions enabled the selling prices to increase by 78 per cent.

The adapted packages were fine-tuned and replicated for wider dissemination in different agroecological systems and countries. Dissemination mechanisms included informing policymakers of the project's achievements through field visits, videos and media work, and facilitating institutional arrangements between partners.

In target countries, the use of LPF technology had a significant positive impact on animal health and productivity and on human health, helping to embrace the One Health concept and its potential regional and global impacts. The fact that LPF technology was tested in three different agroecological zones and on three different animal species provided the opportunity for a broad spectrum of replication. For example, in Ghana and Kenya, LPF was adopted by the national veterinary services, indicating that there may be potential for further replication of the technology in other sub-Saharan countries.

## Lessons learned

Considering the circumstantial evidence that malaria cases have been declining since the project's intervention in Kenya, the need for further investigation (in partnership with the World Health Organization and ministries of health) into the effects of LPF on human health cannot be overstated. However, the need for further development of appropriate policies (e.g. registration and disposal of LPF nets) is crucial in guiding future investments to further scale up the technology.

The main negative perception of smallholder farmers was that LPF was not sufficiently accessible, given that the trial communities were located some distance from commercial centres. The private sector must, therefore, be fully involved in the sale and distribution of LPF.

There is a need to better understand the lifespan of the nets and to develop methodologies to recycle or dispose of them, as well as to investigate their potential residue in the environment.

The Atlas of Health and Climate, published by the World Health Organization, reports that the linkage between diseases and climate change is well demonstrated and that maps have been developed to identify areas at risk around the world.

The costs of controlling "environmental diseases" is projected to increase by US\$2-4 million per

The effectiveness of the LPF technology in target countries had a significant positive impact on animal health and productivity and on human health

year by 2030. Diseases such as malaria, dengue, trypanosomiasis and others transmitted by vectors will threaten a further 2 billion people by 2080. Prevention is key to avoiding these disasters, and the LPF technology integrated in holistic health packages represents a notable step forward in responding to this priority in poor countries worldwide.

## Way forward

The project was highly innovative in developing the technology in partnership with the scientific and development communities, as well as the private sector. The LPF technology that was tested and adopted is simple and does not require significant know-how, unlike other vector and disease control strategies. It can be easily replicated in diverse agro-climatic conditions and with different livestock species. The technology can be further applied to control hygiene conditions of animal products, for instance milk during the milking process, and on farms, in village schools, hospitals and peri-urban areas, where the nets can be used for fencing waste. In Kenya, the local government and national officials see LPF as an integral part of their vector control strategies. The government's argument for scaling up was strengthened by the changes to milk production in the target districts since the introduction of LPF. In Ghana, the government has included LPF in its development strategy for enhancing pig production, and earmarked part of its budget for the training of farmers and linking them with the private sector to enhance the roll-out of LPF.

When considering the sustainability and potential adoption of LPFs, there is much to learn from the use of insecticide-treated nets (ITNs) for mosquito/malaria control. In this case, mosquito nets are being used as a public good (provided free of charge) and through public-private partnerships, and more importantly integrating ITN delivery into maternal and child health programmes (immunization in particular). The use of ITNs is also part of the health policy in sub-Saharan countries. This is a valid approach for the adoption of LPFs.

In order for LPF to be rolled out in all sub-Saharan countries, it is important not only to enhance public-private partnerships with producers but also to take steps to ensure commercial registration of the product in all African countries. Appropriate policies for the disposal of LPF also need to be developed and disseminated with the product. In this regard, a document entitled Disposal of Livestock Protective Fence (LPF) Material was produced. Further efforts are also needed to ensure increased adoption of this innovative technology together with different animal husbandry systems, in order to further develop integrated packages and disseminate them more widely among beneficiaries. Whatever the approach, major donor funding will be required, and socio-economic surveys will need to be continued to gather more information on the farmers' perceptions and adoption potential.

## Knowledge generated

The project shared its findings through reports, videos and various communication material (e.g. press releases in the national press and on TV, leaflets) to enhance the capacity of farmers and to promote the packages among policymakers, development experts and other key stakeholders. Training materials and courses were also developed, and presentations were given at international scientific conferences and institutions, and to political audiences, including donors. Results of the impact of LPFs on animal health and production and on socio-economics were posted on the FAO website. Some of the results can be viewed at the following links:

- Livestock Protective Fence (LPF) for enhanced milk production and mastitis control in intensive zero-grazing dairy farms in Kenya (<http://www.slideshare.net/dairyasada/livestock-protective-fence-lpf-for-enhanced-milk-production-and-mastitis-control-in-intensive-zero-grazing-dairy-farms-in-kenya-dr-rajinder-kumar-saini>)
- Livestock net fencing and animal and human Health ([https://www.youtube.com/watch?v=eD6Ve\\_SjW08](https://www.youtube.com/watch?v=eD6Ve_SjW08))



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