Enhancing Livelihoods of Poor Livestock Keepers through Increased Use of Fodder:

Smallholder cattle fattening in Viet Nam
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Funded by the International Fund for Agricultural Development
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ABSTRACT

This Technical Advisory Note (TAN) describes the transition of smallholder farmers in Ea Kar, whose livelihood was based on small, diversified crop-livestock farms, from traditional ‘cattle keepers’ to market-oriented ‘cattle producers’. Many smallholder farm families keep 1-3 cattle as part of a diversified smallholder livelihood. They graze cattle on grass, herbs and shrubs growing along road sides, fields and waterways, and in nearby forests. In intensively cropped lowland area, farmers supplement grazing with freshly cut native grasses and crop residues. Almost invariably, there are two main issues with this type of production system:

1) Feed supply is insufficient for good animal growth as animals are unable to find enough fodder on heavily grazed land, and
2) Cattle management is very labour intensive as grazing needs to be supervised in cropping areas and cut-and-carry of low-growing, native grasses is very time consuming.

This situation has resulted in thin animals with a low meat yield at slaughter and poor reproductive performance; these animals can only be sold on local markets for local consumption. The purpose of keeping cattle has, usually, been related to preserving capital which can be liquidated easily rather than producing cattle which command good prices as meat animals. There are now opportunities for smallholders to benefit from the increasing demand for higher-quality beef in larger towns and cities but smallholders cannot access these markets unless they change the way they raise, produce and market cattle.

Conditions for uptake

Smallholder cattle fattening, based on growing fodders on farm, is possible in a wide range of environments and conditions. In Ea Kar, more rapid adoption occurred in more intensively cropped agricultural areas. Adoption was slower and lower in extensive farming areas where farms tended to have access to larger grazing lands which are well suited to extensive cow-calf production. Very poor households without cattle and cash reserves could not easily participate in cattle fattening unless credit facilities were available to them. A separate TAN describes an innovative approach of providing credit for cattle fattening through traders.

Existing linkages with other IFAD initiatives:

We, the research project ‘Enhancing livelihoods of poor livestock keepers through increased use of fodder’ (Short name: Fodder Adoption Project or FAP), collaborated closely with the IFAD investment project ‘Improving Market Participation of the Poor’ (IMPP) in Ha Tinh province. The FAP project introduced fodder production and cattle fattening to Ky Anh, an IMPP target district, working with staff of the Department of Agriculture and Rural Development (DARD), commune extension workers and farmers in four communes. IMPP scaled out successful examples from Ky Anh to a further two IMPP target districts, Can Loc and Huong Son. IMPP staff participated in project meetings, field days and training courses arranged by the FAP.

1 TAN # 853-3 ‘Credit through traders – enabling the poorest to engage in cattle fattening’
The target group of the project was poor smallholder farm families operating small, diversified farms producing a range of crops and livestock for home consumption and sale. Farmers used cattle for draught, calf production and as a capital reserve for use in times of financial need. In Ea Kar, often the poorest households belonged to ethnic minority groups or indigenous groups, and these were a special focus of FAP. Women, men and children were all involved in feeding and managing cattle.

**Ea Kar livelihoods**

Smallholder farm families constituted the vast majority of people in Ea Kar District. They operated small, diversified farms (mean size = 1.3 ha) located in an undulating and mountainous area. Soil fertility was low, except for small pockets of fertile land where farmers grew coffee, fruit trees and rice (< 25% of agricultural land). On the remaining land farmers grew maize and a range of other annual crops. Most farms raised poultry, pigs and about 33% of farms raised 1-3 cattle. The mean annual rainfall was 1,600 mm and there was a dry season of 4 months.

A previous project by the International Center for Tropical Agriculture (CIAT) had introduced a range of grass and legume forages to Ea Kar farmers to increase feed availability and reduce the high labour requirements for supervising cattle grazing. The main fodder crops grown were the grasses *Panicum maximum* ‘Simuang’, *Pennisetum purpureum* ‘Napier’ and a *Pennisetum* hybrid ‘VA06’ with small areas of *Brachiaria* hybrid ‘Mulato 2’ and the legume *Stylosanthes guianensis* ‘CIAT184’.

At the start of the FAP in 2007, 2400 farmers were already growing small areas of fodder (mean size = 890 m²) which they used as a supplementary feed for their animals, so reducing grazing time and keeping animals much closer to their house. With only small amounts of fodder available initially, the project had encouraged farmers to use this fodder to fatten individual cattle prior to sale rather than give small amounts to all animals. It had been hypothesised that short-term fattening of thin cattle (mostly 1-2 months) would result in high returns to farmers. Fat cattle attracted a higher price than thin cattle as traders paid for the estimated amount of meat per animal. This strategy was highly successful and by the start of the FAP many smallholder farms were using the concept of ‘buy thin – sell fat’ to generate considerable income for their families.

Commencing in 2007, the FAP engaged with a wide range of stakeholders and built capacity at Government district level to improve smallholder cattle production and marketing in Ea Kar. The project combined participatory approaches to developing and extending agricultural technologies (e.g. Horne and Stur 2003) with an innovation systems approach (e.g. World Bank 2006, Hall et al. 2007). The focus of activities was on linking farmers to city markets, improving the efficiency and quality of cattle production to enable farmers to access these markets, and building capacity of local stakeholders for sustainable cattle development. A separate TAN² describes how the Ea Kar example was up-scaled to more farmers, new districts and in an IFAD-investment project.

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² TAN # 853-1 ‘Up-scaling fodder development in Viet Nam’
Developing market linkages
The project facilitated a series of participatory market studies to assist local traders, farmers and government agencies to better understand the cattle value chain, and facilitate linkages with city traders and slaughterhouses. As some Ea Kar farmers were already producing fat local cattle, participants in market studies identified strong opportunities for Ea Kar cattle producers to access city markets. The idea of these opportunities provided encouragement to traders, farmers and the Ea Kar government and a vision of what might be achieved in Ea Kar.

At the beginning of the project, local traders sold most animals to neighbouring districts and the provincial capital, Buon Ma Thuot but, with the development of market linkages, traders were soon accessing other city markets. In 2004, approximately 70% of cattle were sold to other farmers for breeding and only 30% of animals were sold for slaughter, mostly within the province (Khanh et al., 2004). By 2008, this had changed dramatically and 50% of cattle were sold for slaughter to city markets in Ho Chi Minh, Da Lat and Nha Trang. Unlike local markets, these markets had strict quality requirements which demanded a minimum body weight of 300 kg, a body condition score of 4-5 (with 5 being the highest score for very fat animals) and a maximum age of 4 years.

Building stakeholder capacity
The project placed special emphasis on building a strong coalition of local stakeholders to manage and facilitate fodder and cattle development. Local ownership of the process was seen as key to success and sustainability. By 2010, the range of project partners and key stakeholders involved in the forage and cattle activities had grown from an initial small group of researchers and district extension workers to include farmers’ clubs, local and destination market traders, agricultural banks, women’s and farmers’ unions, DARD and other district government departments, commune governments and commune extension workers (Figure 1).

Staff of the district extension office (DEO) had become the central facilitators, interacting and facilitating the involvement of all local stakeholders (Figure 1). They learnt to facilitate complex stakeholder interactions; form and facilitate farmers’ clubs and farmer production groups; develop technical skills in fodder and livestock production by working with researchers and attending training courses; use participatory extension skills such as Village Learning Activities and cross visits; conduct on-farm experiments with researchers; train commune extension workers in participatory extension, fodder and cattle production; conduct participatory market studies and facilitate linkages with city traders; and engage with policy makers to enable cattle development.

Outputs and impact

**Project outcomes:**
- Farmers adopted fodder production, increased their fodder areas, kept animals in pens, raised more animals, changed from native to larger cattle breeds, produced younger and fatter cattle, sold fat cattle regularly, formed cattle producer groups for sharing experiences and selling cattle, and entered into contracts with traders to supply beef cattle to market specifications.
- Traders forged linkages with slaughterhouses and traders in large cities and delivered high-quality cattle to these markets.
- The local government and the extension office learnt to manage, facilitate and support fodder-based cattle production for the benefit of smallholder farm families, traders and other stakeholders.
- The efficiency of cattle production increased dramatically and provided significant additional income to smallholder farm families.

**Figure 1. Stakeholder linkages in Ea Kar, 2010**
**Fodder adoption and novel production systems**

By 2010, more than 3,100 farms had adopted fodder production (= 31% of households with cattle) and 525 of these farmers were practicing stall-fed cattle fattening for city markets. Another 800 farmers practiced stall-fed cow-calf production using improved breeds and artificial insemination, and others continued to supply local markets. During the project, the average size of fodder plots grown by farmers had increased from 890 to 1,310 m², which was sufficient for stall-feeding two growing cattle. Forage productivity was very high as almost all farmers grew and tended forages like crops, and applied manure and nitrogen fertiliser. Many farmers irrigated at least part of their fodder area during dry periods using existing irrigation equipment needed for coffee production. Water was pumped from fish ponds and ground water.

Cattle fattening underwent significant changes (Table 1). By 2010, the farmers engaging in cattle fattening had increased the average size of their fodder areas to 2,860 m², increased the average number of cattle fattened to 3.8 animals; moved from native cattle breeds to larger Laisind and cross-bred cattle; produced younger cattle as demanded by markets; and fed ad libitum fresh fodder plus an average of 2.9 kg of farm-mixed concentrate supplement.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>2007</th>
<th>2010</th>
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<tbody>
<tr>
<td>Forage area (m²)</td>
<td>890</td>
<td>2,860</td>
</tr>
<tr>
<td>Number of cattle / fattening cycle</td>
<td>1.7</td>
<td>3.8</td>
</tr>
<tr>
<td>Percentage of native cattle breeds, %</td>
<td>74</td>
<td>8</td>
</tr>
<tr>
<td>Age of animal at start of fattening, months</td>
<td>33</td>
<td>14</td>
</tr>
<tr>
<td>Length of fattening cycle, months</td>
<td>2.5</td>
<td>4.5</td>
</tr>
<tr>
<td>Finishing weight, kg</td>
<td>295</td>
<td>355</td>
</tr>
<tr>
<td>Daily weight gain, kg</td>
<td>0.65</td>
<td>0.75</td>
</tr>
<tr>
<td>Monthly financial gain, USD/animal</td>
<td>n/a</td>
<td>40</td>
</tr>
</tbody>
</table>

The changes in the production system were supported by stakeholders. One example was the increase in the demand for artificial insemination (AI), which was essential for cross-breeding. While AI was available free of charge from the government from 1996-2000, demand was low and only 100 cows were successfully inseminated in 2000. By 2008, farmers had to pay for both semen and AI service (USD 14-17 per successful conception) but demand had increased and 1,540 cows were successfully inseminated. AI service providers reported that raising cows in pens had a positive effect on the accuracy of heat detection by farmers and improved conception rate.

**Financial returns and labour inputs into cattle fattening**

Farmers’ profit from cattle fattening ranged from USD 0.7 – 1.2 per animal per day (deducting all cash inputs including interest on capital, fertiliser, animal health and concentrates, but not considering the cost of land and labour).

Farmers, fattening 2 cattle at one time, on average spent 1 hour / animal / day to cut fodder, provide feed and water, clean the pen and look after the animals during the fattening period; resulting in a return to labour of approximately USD 0.95 per hour. Farmers fattening 4 animals at one time were able to reduce labour inputs per animal fattened further.

For comparison, a case study of 20 households practising traditional cattle production in Ea Kar showed that the mean financial return was USD 0.30 per animal per day (4 cattle per household, no planted fodder), and the return to labour was USD 0.18 / hour.
Constraints faced during the implementation

One issue that was difficult to address was the low participation rate of indigenous people who made up 9% of the population and tended to be among the poorest households of Ea Kar. Several factors contributing to this situation were identified. These were (i) the relatively remote location of indigenous villages and their better access to communal grazing areas, (ii) cultural and language misunderstandings, and (iii) limited access to finance. The project addressed these issues by employing an indigenous extension worker to work with interested indigenous villages, and by facilitating access to credit for cattle fattening through traders on a pilot scale. These measures met with some success and the credit through traders’ mechanism is discussed in a separate TAN # 853-3.

Sustainability, Acceptability and Accessibility

The relatively high adoption rate of fodder production, stall-feeding, new breeds, efficient animal production techniques and changes in cattle marketing reflected the ability of local stakeholders to make smallholder cattle fattening more profitable and sustainable. Many factors contributed to sustainability and acceptability: The high degree of farmer and local stakeholder involvement in the development of fodder and cattle production and marketing ensured that there was strong local ownership of activities, and that the solutions were appropriate for local conditions. Strengthening the capacity of DEA staff in growing into the role of stakeholder facilitator was central to ensuring local leadership. DEA interacted closely with DARD and the local government to ensure that the fodder and cattle development activities were fully supported by the government, consulted continuously with farmers and their representatives, worked closely with the researchers and managed the extension process. The researchers accepted their changing role from major driver of the process to strengthening capacity of local stakeholder and becoming a supplier of research and training. Excellent personal relations among the key stakeholders was another critical factor that contributed to success and sustainability.

For farmers who already had cattle there were no significant limitations to adoption. Forage grasses could all be propagated vegetatively from rooted stems and a local market for planting material developed during major expansion phases. New farmers only needed a small amount of planting material and could then expand the area from their own cuttings. Fattening cattle before sale could be done by anyone who already had cattle, and this added considerable value to the animal. Often farmers obtained an additional USD 50-100 for an animal that had been ‘reconditioned’ for 1-2 months prior to sale. Once farmers sold a fat animal, they generally tried to buy (or share-farm) other thin animals which they could fatten for sale. Often, selling only 1-2 fat animals enabled farmers to save sufficient funds to continue to ‘buy thin – sell fat’.

Farmers without cattle and cash reserves could not easily participate in cattle fattening. In Ea Kar, the local government negotiated with local banks to provide loans for cattle fattening for eligible poor households, provided they had attended training and joined a farmers’ club to ensure support from experienced farmers. This enabled many, otherwise excluded households to engage in cattle fattening. Credit for this activity only needed to be provided for short periods as fattening took only 2-4 months so loans could be paid back quickly. Nevertheless, obtaining credit is always an arduous task and farmers tried to manage without loans if at all possible. Share farming arrangements were also common in many villages and these enabled farmers without animals to get started.
Gender dimension

The vast majority of cattle in Viet Nam were raised by smallholder farm households usually consisting of a married couple and their children; occasionally households also included a grandmother and/or grandfather. All family members contributed to livelihood activities to the best of their abilities. The husband and wife usually worked full-time on the farm, and it was the children (and older people) who helped with supervising the grazing of cattle in traditional cattle production systems. Without children (and older people), supervising the grazing of cattle was very difficult as it was so time consuming. With the introduction of fodder crops, farmers could feed and manage stall-fed cattle more quickly and the task of doing so was generally performed by the husband and wife team. Children were still responsible for taking cattle for a walk 1-2 hours a day, but this was a much shorter task than when they had had to spend 4-8 hours a day supervising cattle grazing.

Further research needs

There is a need for continued support for farmers so they can make their evolving cattle production system more efficient and competitive. In particular, animal nutrition research is needed to help farmers provide well-balanced and cost-effective diets, and breeding strategies need to be developed. There is a need to further explore marketing options such as the development of an ‘Ea Kar beef’ brand, and the potential for establishing a local livestock markets for buying and selling animals. As smallholder fodder and cattle production develops further, assessing the impact of the new systems on households, gender and different ethnic and social groups is vital in order to find ways to ensure equitable and inclusive development.

Dissemination pathways

The main mechanisms for farmer learning and up-scaling were the (i) formation of farmers’ clubs (farmers’ interest groups for cattle fattening, cow-calf production or extensive cow-calf production), (ii) introduction of Village Learning Activities (VLA) where farmers’ clubs evaluated different options for improvements (e.g. ad libitum feeding of forages, different amounts and composition of concentrates) and sharing of the results with other farmers, (iii) cross visits and field days to introduce new farmers to successful examples, and (iv) training courses. Farmers’ clubs were an effective mechanism for facilitating learning among farmers and delivery of appropriate training.
USEFUL INFORMATION

Year of publication  2011

References / Further information


Hall, A., Sulaiman, R. & Bezkorowajnyj, P. 2007. Reframing technical change: livestock fodder scarcity revisited as innovation capacity scarcity. (ILRI), UNU-MERIT), ICRISAT, IITA on behalf of the System-wide Livestock Programme (SLP) of the CGIAR.


Useful links

http://fodder-adoption-project.wikispaces.com/
http://fodderadoption.wordpress.com/

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Acronyms

CIAT    International Center for Tropical Agriculture
DARD    District Agriculture and Rural Development
DEO     District Extension Office
FAP     Fodder Adoption Project – short for TAG 85 Enhancing Livelihoods of Poor Livestock Keepers through Increased Use of Fodder’
IFAD    International Fund for Agricultural Development
IMPP    Improving Market Participation of the Poor
ILRI    International Livestock Research Institute
NGO     Non-Government Organisation
NIAS    National Institute of Animal Science
TAN     Technical Advisory Note
TNU     Tay Nguyen University
VLA     Village Learning Activities
Background
Livestock are an important pathway out of poverty for the rural poor. Worldwide, 50% of the world’s poor own livestock and depend on them for their livelihoods. Livestock are living assets contributing to food security and are an important source of protein and minerals for nutritional security.

There is increasing demand for livestock products worldwide in the form of meat, milk and milk products such as cheese and butter. This presents poor livestock producers with significant opportunities to increase benefits from their livestock and raise income through livestock markets. Access to fodder and water are often identified as major constraints to livestock productivity. This inability to feed livestock adequately remains one of the most widespread global constraints in the livestock sector. Removing it would assist smallholder livestock producers to improve their livelihoods by taking advantage of market opportunities and building assets.

Past efforts to enhance smallholder livestock production have shown little evidence of widespread adoption of new technological innovations such as new fodder options or new ways of feeding livestock. This has been attributed to a range of factors including poor approaches to introducing technologies, inappropriate technologies and services relative to the needs of the poor, low sustainability of the changes introduced, inadequate local livestock-support organizations and weak linkages to markets. Recent experiences in Nigeria and India focusing on fodder issues have highlighted the importance of understanding and developing partnerships and processes and working in what is known as an “innovation systems framework” to achieve sustainable improvements in poverty reduction. In effect this involves focusing on putting knowledge to achieve desired social/economic outcomes. Such knowledge is held by different “actors” within the system; looking at how these actors interact, their working practices and the policy environment in which they operate can help to remove bottlenecks to development. Recent experiences in Southeast Asia with developing forage technologies with active participation of poor farmers and local extension services have shown that this approach results in high adoption rates at project sites and surrounding areas.

Furthermore, studies by International Agricultural Research Centres (IARCs) and their partners show that when fodder options are linked to markets for meat and milk and when they have direct effects on income generation, fodder options to support livestock production are competitive with other farm enterprises in terms of returns to land and labour. These successful experiences in fodder uptake and significant accumulation of knowledge on preferences for fodder plants, seed systems, fodder management and integration of fodder into feeding systems provide the technical platform for this project.

Project Goals
The current project seeks to engage with a wide range of stakeholders to strengthen the capacity of poor livestock keepers to:

- select and adopt fodder options
- access market opportunities to enable them to improve their livelihoods.

The project seeks to achieve these goals in ways that will ensure the sustainability of their farming systems. The programme is framed around four overall outputs and associated activities. The project seeks to establish:

- Mechanisms for strengthening and/or establishing consortia of players in the livestock/fodder arena to allow small-scale innovations to spread across systems.
- Options for getting research off the shelf and into practice including innovative communication strategies and strategies for making changes at farm level to sustainably improve fodder supply.
• Enhanced capacity of project partners to experiment with and use fodder technologies through effective communication, improved access to technical information and training and a better understanding of the role of diverse players and their interactions in successful fodder development.

• Generic lessons with wide applicability on innovation processes and systems, communication strategies and partnerships that provide a suitable environment for fodder innovations to spread across systems.

Geographical focus

The project is implemented in Ethiopia, Syria and Vietnam:

• Ethiopia. The project has activities in four pilot learning sites. We are working with the Improving Productivity and Market Success of Ethiopian Farmers (IPMS) project (a Canadian-funded Ethiopian Ministry of Agriculture and Rural Development project, implemented under ILRI’s leadership in collaboration with national organizations and other CGIAR centres) in Atsbi, Alamata, Mieso and Ada’a.

• Syria: The project is being implemented at El-Bab, Salameih and Tel-Amri in Aleppo, Hama and Homs provinces respectively. It builds upon previous forage introduction by ICARDA and the Syrian Ministry of Agriculture and Agrarian Reform in El-Bab, and ICARDA and Aga Khan Development Foundation in Salameih.

• Vietnam. The project is working at two learning sites. These are located in Ea Kar district, Daklak and in Ky Anh district, Ha Tinh. In Daklak, the project builds on previous introduction of forages by CIAT and Tay Nguyen University. In Ha Tinh, the project works within the project area of IFAD Loan Project ‘Programme for improving market participation of the poor (IMPP)’ using the lessons on fodder innovations generated at the Daklak learning site.

Project partners in the implementation of the programme

The International Livestock Research Institute (ILRI) is the implementing agent on behalf of the System-wide Livestock Programme. SLP provide strategic guidance and provide links with a sister project on Fodder Innovations funded by the UK Department for International Development. The programme is funded by the International Fund for Agricultural Development (IFAD). ILRI coordinates the project in the three countries, and leads activities on the ground in Ethiopia in collaboration with the IPMS project which has an ongoing programme of fodder development research. In Syria activities are led by the International Centre for Agricultural Research in the Dry Areas (ICARDA) with co-operation from the Syrian Ministry of Agriculture and Agrarian Reform and the Aga Khan Foundation. In Vietnam activities are led by the International Centre for Tropical Agriculture (CIAT) with co-operation from the Vietnam National Institute of Animal Science, Tay Nguyen University, district and provincial Departments of Rural Development at the pilot learning sites and the IFAD IMPP project.

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