

## Programme Completion Report

TAG 853-ILRI



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

A report prepared for

## The International Fund for Agricultural Development

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

Short name: Fodder Adoption Project (FAP)  
(TAG 853-ILRI)

## Programme Completion Report

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Report prepared by Alan Duncan<sup>1</sup>, Werner Stur<sup>2</sup>, Asamoah Larbi<sup>3</sup> and Tassilo Tiemann<sup>4</sup>

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<sup>1</sup> International Livestock Research Institute, PO Box 5689, Addis Ababa Ethiopia; [a.duncan@cgiar.org](mailto:a.duncan@cgiar.org)

<sup>2</sup> International Center for Tropical Agriculture (CIAT), P.O. Box 783, Vientiane, Lao PDR;  
[w.stur@cgiar.org](mailto:w.stur@cgiar.org)

<sup>3</sup> Dr Asamoah Larbi, ICARDA, PO Box 5466, Aleppo, Syria ([a.larbi@cgiar.org](mailto:a.larbi@cgiar.org))

<sup>4</sup> International Center for Tropical Agriculture (CIAT), P.O. Box 783, Vientiane, Lao PDR;  
[t.tiemann@cgiar.org](mailto:t.tiemann@cgiar.org)

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## 1. Extended Summary

### Goal and purpose

The goal of the Programme was to improve the livelihoods of poor livestock keepers in Ethiopia, Syria and Vietnam in a sustainable manner through increased access to and adoption of fodder interventions.

With activities in Ethiopia, Syria and Vietnam and linking with a project implemented in Nigeria and India, this Programme aimed at better understanding the factors and processes that determine the success of fodder interventions in developing countries. This understanding was used to strengthen the capacity of poor farmers and service providers to better meet their needs for fodder.

### Implementation

The programme was co-ordinated by the International Livestock Research Institute. The programme was divided into three separate country components in each of Ethiopia, Syria and Vietnam. These country components were led by the International Livestock Research Institute (ILRI) for Ethiopia, the International Center for Agricultural Research in the Dry Areas (ICARDA) for Syria, and by the International Centre for Tropical Agriculture (CIAT) in Vietnam. In each country, project implementation was achieved by close collaboration with a range of national research and development organizations. Harmonization of project activities was achieved through annual co-ordination meetings which rotated around the different project locations. The project sat within the portfolio of projects managed by the CGIAR Systemwide Livestock Programme (although without financial support). This facilitated links with the DFID-funded Fodder Innovation Project, a sister project on fodder innovation with activities in India and Nigeria.

### Outputs and results

#### *Output 1 - Mechanisms for strengthening and/or establishing multi-stakeholder alliances that can enable scaling up and out of fodder technologies.*

The project embraced an innovation systems conceptual framework and placed a strong emphasis on experimenting with different ways of building innovation capacity at project sites through establishment of multi-stakeholder alliances. The first step for the project was the selection of learning sites in the three countries (**activity: Identification of project sites, partners and work plans**). In Ethiopia project sites were selected from a long-list of learning sites which had already been established by the Improving Productivity and Market Success of

Ethiopian Farmers project (IPMS). The specific research sites for FAP were selected on the basis of their potential for enhancing livestock value chains. The selected research sites were at Mieso, Ada'a, Alamata and Atsbi. The IPMS project was already adopting an innovation systems approach as part of its strategy and this was built upon for the purposes of FAP. In Syria project sites and partners were identified through start-up workshops involving research and development partners and decision-makers from the public and private sectors. El-Bab, Salameih and Tal-Amri in Homs, Hama and Aleppo provinces respectively, were identified as pilot learning sites using sheep population, market access and availability of partners as selection criteria. Local advisory committees responsible for preparing work-plans and budgets, and implementing and monitoring activities were established early on. In Vietnam, the project was implemented at two sites, one in the southern central part of Vietnam, Ea Kar district, Daklak province and one in the northern central part, Ky Anh district, Ha Tinh Province. The first site was selected as a more advanced site where forages had already been introduced and so provided an opportunity for market-oriented cattle development while the second site was a new site embedded within an IFAD loan project. Strong linkages between the two sites were developed to enhance learning innovation, and so accelerate the adoption and change processes.

Having established project sites, partners and workplans, a further step was to assess the existing innovation capacity at project sites using innovation system principles (**activity: Evaluation of actors, linkages, practices and habits related to fodder innovations**). Early in the project a training workshop on innovation systems tools and concepts was arranged in Ethiopia (with participation by partners from Syria and Vietnam). This workshop was influential in raising awareness of innovation system principles among project participants in the three project countries. In Ethiopia, the workshop laid a good basis for subsequent establishment of local innovation platforms at the FAP learning sites in Ethiopia. In Syria, diagnosis of innovation capacity at local learning sites showed that feed and livestock producers and staff of public research and extension, ICARDA, and the Aga Khan Rural Support Programme were the key actors in the fodder innovation system at the pilot sites. These players were subsequently involved in learning alliances responsible for implementation of project activities. In Vietnam, innovation capacity was assessed through consultations with key informants to identify local stakeholder groups and individuals. Further stakeholder analyses were conducted at intervals through the project. These analyses helped to build understanding of key actors and led to formation of local coalitions driving innovation around cattle production at the two learning sites.

Having identified learning sites the original project plan was to use GIS methodology to identify recommendation domains for fodder interventions (**activity: Development of Geographical Information Systems on pilot sites in relation to fodder interventions**). In the event, as the project evolved participants became less convinced on the utility of this approach since we came to realise that institutional factors were stronger determinants of adoption than agro-ecological factors. As a result there was limited effort in the use of GIS in the project. In

Vietnam, maps were used to track spread of adoption of planted forages and identify areas (and factors) of low adoption but here and elsewhere conventional suitability maps were not ultimately developed.

The project placed a strong emphasis on the role of market “pull” in driving adoption of improved feeding practices at local level. To this end various market appraisals were conducted in project countries over the course of the project (**activity: Evaluation of livestock market environment influencing fodder demand, access and utilisation**). Rapid market appraisal methods were the topic of a cross-country training event arranged in Ethiopia and drawing participants from all three countries. In Ethiopia this training was used as the spring board for rapid market appraisals on the fodder market in project sites. These RMA’s were conducted by local partners and revealed a nascent but growing market for commercial smallholder fodder trading. In Syria, a survey at El-Bab and Salameih showed that fodder/livestock markets to be well developed. The survey identified government controls on export and import of fodder/livestock and prices of major feeds, including barley grains, wheat bran and cotton seed cake. Supply and use of fodder was found to be dependent on factors such as the availability of land, water, forage seed, markets, and annual rainfall. In Vietnam, cattle marketing studies and a participatory market study delivered valuable information and permitted representatives of farmer clubs, traders and extension workers to identify demand (in terms of quantity and quality) for cattle and beef and to assess opportunities for smallholders to access city markets. The establishment of contacts between farmer groups and traders and a meat company, respectively, was facilitated with the successfully achieved aim to improve the supply chain and market opportunities for smallholders through contract fattening to agreed prices.

### *Output 2 - Options for effective delivery systems including innovative communication strategies and on farm interventions to improve fodder supply:*

Previous efforts to introduce improved feeds into smallholder livestock systems have tended to focus on introducing the technologies themselves through demonstrations, technical training and provision of inputs. Such project-led approaches have tended to neglect crucial sustainability issues including the means by which farmers will gain access to needed inputs such as seed and technical information once the project phases out. Furthermore there has been a tendency to focus on “technology promotion” without adequate characterization of existing feed resources, seasonal gaps and the wider issues that constrain technology adoption. This output was about addressing these wider issues.

The first step was to develop simple tools for characterization of livestock production and feeding constraints (**activity: Innovative approach for evaluation of year-round feed inventory, assessment and database**). Partners from Vietnam, Ethiopia and India worked together to develop a rapid assessment tool for feed resources (FEAST). The prototype tool was developed

at a cross-country workshop and was subsequently extensively modified through testing in field sites in Ethiopia, Vietnam, Kenya, India, Bangladesh and Nepal. The tool was designed to provide a systematic framework for characterizing feed resources and teasing out key constraints and solutions using participatory methods. In Syria a simple tool was developed and used to document household feed inventory at El-Bab and Salameih. Feed gaps were revealed during early spring and winter. In Vietnam, the Feed Assessment Tool (FEAST) was tested in 2010 in an Asian context and found to be a useful means of characterizing feed resources. The tool is now being used in a range of other projects implemented by ILRI including the East Africa Dairy Development Project and the Cereal Systems in South Asia project.

As well as these rapid assessment methods, formal baseline surveys were undertaken in all three project countries (**activity: Collection of baseline data**). In Ethiopia a socio-economic baseline survey in 560 households was conducted across 3 learning sites. This survey gave a comprehensive picture of feeding practices and productive outputs from the livestock enterprise across the study sites. It revealed the heavy reliance on unimproved feed sources of low nutritive value, primarily crop residues, with a near absence of improved feeds. It also showed the near absence of livestock of improved genetic merit. As the project evolved, the emphasis moved to the characterization of institutional blockages to change along with action research to overcome such blockages. We therefore also conducted a baseline stakeholder analysis. In Syria a baseline survey was also conducted in around 300 households across project sites. The survey revealed a shift from extensive grazing to semi-intensive, and intensive fattening and dairying systems based on zero grazing. Barley grain, wheat bran and cotton seed cake were identified as the most important concentrate feeds. Survey results indicated that most farmers (65-80%) considered high feed cost as a major livestock production constraint. Rainfed barley, common vetch, grasspea, and irrigated alfalfa were found to be the main fodder crops. Scarcity of land, water, forage seed, and high labour cost were identified by respondents as constraints to fodder production. In Vietnam, a wide range of production and market surveys was carried out over the course of the project, documenting the change in cattle production systems from a traditional asset-based system towards a commodity based, market-oriented production system in the last 5 years.

To deal with sustainability issues and to enhance likelihood of improved forage options continuing to be used and to spread following project exit we addressed delivery mechanisms for planting material and other inputs including knowledge inputs in various ways in the three project countries (**activity: Evaluation of fodder and seed delivery/input supply mechanisms**). Delivery mechanisms to smallholder farmers (of inputs and information about improved feeding methods) were a strong focus of FAP activities in Ethiopia. Work in this area focused on trial forage introductions with an emphasis on participatory and stakeholder-led mechanisms including developing linkages between smallholders, extensions services and private sector seed suppliers. We also arranged national level discussions on seed supply mechanisms and these have continued after project exit. In Syria, village-based seed systems were promoted to improve seed supply. Improved forages/feeding packages were disseminated through on-farm



demonstrations. In Vietnam, previous forage introduction had focused on grasses which can easily be propagated vegetatively using farmer-to-farmer exchange. With abundant planting material already in the system there was less need for strengthening seed supply mechanisms. The focus here was on delivery of other inputs. For example, a credit system was facilitated through a local bank which gave the poorest farmers the opportunity to start with cattle fattening activities.

*Output 3 - Enhanced capacity of project partners to experiment with and use fodder innovations through effective communication, technical information and training in diverse aspects placing fodder interventions in the context of systems of innovation*

In adopting an innovation systems conceptual framework, one of our starting points was the acknowledgement that stagnation in feed development partly relates to insufficient pathways for knowledge exchange among key actors at different scales. We thus experimented across the project with different mechanisms for making knowledge travel and for connecting actors at different scales in order to accelerate innovation (**activity: Development of appropriate communication strategies for joint learning within and between countries**). We looked at within country knowledge sharing mechanisms at scales from local to national. Furthermore, the regional nature of this project with activities going on in 3 very distinct regions allowed us to experiment with ways of sharing knowledge and research for development approaches across countries. This was one of the key opportunities and ultimately a key strength of FAP.

In Ethiopia the project experimented with mechanisms for co-learning among stakeholders at various scales. At the learning site scale the main learning mechanism we tried was the establishment and facilitation of local innovation platforms. These brought together diverse stakeholders on a regular basis to identify current constraints to livestock feeding and to look for practical ways of dealing with such constraints. We had variable success with such approaches but developed some useful lessons on how to make such methods work and also highlighting some limitations. In Syria, to enhance capacity of partners to experiment with fodder innovations, joint learning between project sites was facilitated through annual planning workshops, short-term training, field days, and exchange visits. In Vietnam, at learning site level strong local coalitions consisting of local stakeholder including representatives of district and commune government, veterinary and extension offices, farmer groups, women's union, traders and researchers ensured local leadership, communication and involvement of all relevant stakeholders. District governments reported progress of cattle development to provincial governments who sent representatives to all major project meetings and took the lead in upscaling successful forage and cattle development to other districts. The two learning sites were linked through annual review and planning workshops, which included field visits and brought together key stakeholders from both sites. To improve exchange and mutual learning further trainers from the more advanced site were sent to support and mentor staff at the later established site. The National Institute of Animal Science (NIAS) was the main national partner



of the project and was responsible for reporting and bringing project outcomes to the attention of the national government.

Through partnership with the Fodder Innovation Project we drew insights on innovation theory and experimented with their practical outworking (**activity: Identification and participation in training modules for innovation systems (with DFID Fodder Innovation Project)**). This was achieved through cross-project visits, co-participation in co-ordination meetings, cross-project participation in workshops and through e-mail correspondence with FIP colleagues. The alliance between FAP and FIP provided a rich learning ground and strengthened critical mass of those assessing feed scarcity from an innovation systems perspective.

Capacity building at different levels was a strong emphasis of FAP (**activity: Identification of partner capacity building needs**). In Ethiopia, we assessed training needs informally and soon identified the need for upgrading skills of extension workers and farmers on forage management. We delivered many training events in collaboration with our local partners in each of our study sites. We also engaged in upgrading skills and understanding of innovation systems approaches through a number of local, regional, national and international workshops. Project partners from Syria participated in a short-course on innovation systems organized by ILRI in Ethiopia. In Syria short-courses on forage/forage seed and livestock production, crop-livestock integration, and socio-economic survey methods were organized for extension and research staff. Two graduate students (1 M.Sc. and 1 Ph.D.) were trained. In Vietnam, training for farmers included: forage establishment, management and utilization, cattle fattening and improved cow-calf production. Training courses for extension workers included (i) technical issues such as forage agronomy, animal nutrition and feeding systems; (ii) extension methodology such as participatory approaches to working with farmers, improved communication and group facilitation skills, and how to conduct Village Learning Activities (VLA) and (iii) market-related issues such as formal market assessment and participatory market studies.

Turning to communication mechanisms, we developed communication products at various scales in FAP (**activity: Development of project communication material**). In Ethiopia, for example at site level we worked with national partners to produce forage fact sheets. At national level we convened regular Fodder Roundtable Meetings which were written up as briefs. We communicated project results internationally through an active blog, through online videos, and by posting documents and presentations on the ILRI repository. Similarly in Syria we engaged in development of extension leaflets in collaboration with specialists from the Animal Wealth Research Administration and Extension Directorate of the Syrian Ministry of Agriculture and Agrarian Reform. One thousand copies of each leaflet were printed and distributed to farmers. A range of other publications, including Technical Advisory Notes (TANs) and journal publications are in progress. In Vietnam, a range of communication materials were produced including three guide booklets summarizing essential information on cattle fattening, cow-calf management and forage management for extension workers, practitioners and other

stakeholders, a range of extension leaflets for distribution to extension offices and farmers, a poster on planting and using forages for extension offices, and several presentations at international conferences and publications in national and international journals.

*Output 4 - Generic lessons with wide applicability on innovation processes and systems, communication strategies and partnerships that provide an enabling environment to enhance scaling up and out of fodder innovations*

The diversity of sites and the range of country contexts provided a natural laboratory for considering issues related to site selection and comparison (**activity: Principles for site identification and comparison (innovation systems framework)**). Early on we developed a site description matrix which provided systematic information on all nine FAP project sites. This was taken up in a meta-analysis of project sites and application of innovation systems in the final year of the project. This meta-analysis allowed an overview of the very diverse approaches to enhancing feeds for livestock development adopted across the project and allowed some generic lessons to be distilled. The study clearly showed the importance of national context and how this constrains approaches. For example, strong government subsidy regimes for cereals in Syria are an obvious barrier to forage development. Furthermore, increasing demand for livestock products in Vietnam provide a strong enabling environment for development of improved feeding strategies.

The regional nature of the project provided scope for developing cross-country approaches in various areas (**activity: Identification and streamlining of project tools/methodologies**). At the first co-ordination meeting we identified three areas of commonality across the project which would form the basis for cross-country learning. These were Feed Assessment, Market Appraisal and Innovation System Tools. Various steps were subsequently taken to bring together the activities of the three countries in these three areas. For Feed Assessment, we convened a cross-country workshop in Hyderabad, India in 2009. This brought together experts from Vietnam, India and Ethiopia to develop a rapid feed assessment tool. Out of this meeting we developed a prototype feed assessment tool (FEAST) which was subsequently refined and tested in Ethiopia, Vietnam, Kenya, India, Bangladesh and Nepal. The tool is now being used to support design of intervention strategies in at least two research for development projects (East Africa Dairy Development Project and Cereal Systems in South Asia Project). For the market appraisal theme, a training involving participants from all project countries was organized in Addis Ababa in 2008. This was used as the springboard for fodder rapid market appraisals at the Ethiopian sites. Rapid market appraisal methodology was already being used in the Vietnam sites. For Innovation System tools and methods, again, we convened a cross-country training workshop in April 2008 in Ethiopia which brought together participants from all three project countries. The training was influential in setting the innovation agenda for the project. The Workshop led to application of similar tools across all countries for assessment of innovation capacity. More importantly, it

helped to develop the conceptual thinking of the project participants in innovation systems perspectives and this had a strong influence on subsequent activities.

Finally, the focus on innovation system principles as a conceptual framework for project activities meant that we acknowledged the need to consider policy issues and the way in which context either enables or inhibits innovation at local level (**activity: Evaluation of policy and institutional environment**). In Ethiopia we conducted a policy analysis and also analysed the institutional context using a diagnosis of innovation capacity at three learning sites. Results revealed a strong policy emphasis on arable production and minimal consideration of livestock as an income generation option for smallholders. In Syria, interviews with stakeholders at learning sites showed that fodder and livestock production could be improved through government policies aimed at removing restrictions on import and export of fodder/livestock, enhancing small-scale farmers access to subsidized loans and feed, ensuring effective forage seed delivery systems, improving water availability through irrigation, provision of improved rams, and revising the list of strategic crops to include more fodder crops. In Vietnam, the emphasis was on local policy issues. Collaboration of the local government was identified as key to creating an enabling environment for forage and livestock development. Examples of issues under local government control included grazing restrictions in forage growing areas and simplification of trading regulations. District governments at both project sites were very interested in promoting cattle development further and created a favourable environment for these activities, increasing the likelihood of a sustainable impact of this project. Lessons on how to engage local policy makers were drawn.

### **Outcomes and Lessons: Synthesis of work on innovation, scaling out and market development**

Three strands of the project provided our framework for summarising some of the approaches to fodder development that evolved through project activities in the three countries. These were *Innovation, Scaling Out* and *Market Development*

#### **Innovation**

The assimilation of innovation systems thinking into project activities was an emerging theme of the project and played out in different ways in the three project countries. In Ethiopia, the project pro-actively established and facilitated local innovation platforms at study sites and used these as the central mechanism for bringing about change in farming practice. Innovation platforms were combined with introduction of planted fodder early in the project. This combination of technology introduction and a focus on enhancing stakeholder networking was a hallmark of activities in Ethiopia. The result was modest adoption of forage technologies at farm level accompanied by significant change in stakeholder attitudes and behaviour which we anticipate will lead to more substantial long-term change at farm level.

In Syria the approach was similar although perhaps with greater emphasis on introducing new technologies to farmers. In Syria there was a more challenging external environment with a strong extension service, heavy government intervention in pricing of agricultural commodities

and few NGO or private sector actors. This scarcity of non-government actors limited the diversity actors involved in innovation platforms. Within these constraints we noted strong farmer adoption of technologies introduced by the project and a greater connectedness of key actors including the Ministry of Agriculture and Agrarian Reform and the Aga Khan Rural Support Programme.

In Vietnam we saw widespread system change in farming practice from subsistence based cattle system to a market-oriented system in which breeding and feeding practices were substantially changed with strong benefits for farmer livelihoods. This change was facilitated by the Fodder Adoption Project and, in the case of the more advanced learning site Ea Kar, predecessor projects led by CIAT. In Vietnam a coalition of local key stakeholders was formed at each learning site and these took responsibility for driving and facilitating cattle development. While national project partners were initially instrumental in facilitating local coalitions, this responsibility quickly evolved to local partners, the district extension of agriculture offices. Also, the composition of local coalitions changed as the project progressed. These stakeholder changes were described in detail in a paper by Khanh et al (2009). “Actor-oriented” approaches were a strong element of project activities. As in Ethiopia, there was an early emphasis on introduction of promising forage technologies using participatory approaches. “Village learning activities” were used to great effect to develop farmer capacity to experiment with new feeding and breeding practices. Following early pockets of success in introducing new technologies there was strong emphasis on working with local government extension workers to bring about sustained change, link farmers with markets and upscale adoption. As the project progressed the range of actors reached by the project widened; actors from across the value chain became involved, notably traders and buyers of cattle from distant markets. The link between promising technologies and linking farmers to markets through facilitation of stakeholder linkages was a key element of success in Vietnam and in many ways, the example of Vietnam provided the project with a flagship model for livestock development, elements of which were tried in the other countries.

In summary, across all three project countries our approach was to combine the introduction of promising technologies with a pro-active emphasis on bringing key actors together at important points in the development process. In Ethiopia and Syria this was done through innovation platforms while in Vietnam the same end was achieved through facilitation of ad hoc interactions among important stakeholders. In Vietnam a tipping point was reached and we saw widespread system change following continuous engagement by CIAT and local partners in project sites for a number of years. In Ethiopia and Syria the tipping point has yet to be reached but we see promising signs of change in actor behaviour which will need to be followed to assess whether they are sustained and lead to widespread change in farmer practice.

### Scaling Out

Scaling out activities were somewhat different in the three project countries partly because project activities were at a different point in the development trajectory in each country. The

most advanced scaling out activities were in Vietnam where a strong strategy for scaling out early successes was developed. The general approach was to focus at village level to begin with through introduction of new practices through Village Learning Activities. Some of this had happened before FAP began. Having established early pockets of success local extension workers were brought on board through site visits and interactions with farmers. The project then provided technical support for scaling out of successful technologies but the scaling out was led by the local extension department. Such scaling out approaches were still relatively local involving the local district extension workers. An important activity of FAP was to extend project activities to a completely new site, Ha Tinh. This was achieved through exchange visits early in the project. A key element success was allowing government officials to hear first hand from their counterparts in the advanced learning site about how things had progressed in their site. This led to rapid adoption of new feeding practices in the new learning site over project life.

In Ethiopia, scaling out of technologies did not progress beyond district level (woreda) during the lifetime of FAP. However, the project did have some impact in terms of scaling out of innovation systems approaches to actors beyond project sites. This was achieved through regular meetings of a national Ethiopian Fodder Roundtable at which innovation approaches were presented. At district level we found considerable enthusiasm for scaling out of planted fodder by local extension offices. The scaling out was achieved through conventional government mechanisms rather than through spontaneous adoption and it remains to be seen how sustainable such efforts are and whether they continue beyond the project lifetime. One issue we encountered was the question of what was being scaled out: technologies or innovation approaches. We tended to find that government extension officers were keener on the former and it is too early to say whether we see sustained use of innovation approaches in study districts and beyond.

In Syria, again we saw scaling out of successful technologies at district level but as in Ethiopia it is as yet unclear whether the use of local stakeholder platforms has been taken on by local stakeholders and will persist beyond project life.

### Market development

Market development activities varied by country partly because of the different stages of maturity of project efforts in the three locations. In Ethiopia, the project started by introducing planted forages at district level. Early successes were used to build stakeholder engagement. Towards the end of the project we saw local stakeholders turning attention to marketing issues in at least one of our sites. Thus in Ada'a, by the end of the project local stakeholders were negotiating arrangements for procurement of milk rather than focusing on fodder production issues. In all three countries a similar pattern was observed: using fodder as an entry point but maintaining a strong focus on stakeholder processes led naturally to dealing with bottlenecks further along the value chain. In Vietnam, this process had reached maturity so that much of the

project effort was focused on developing market arrangements with traders, re-orienting production to meet market demands, dealing with credit provision and so on. In Syria, there was limited work on market development perhaps because livestock production systems are already relatively mature and market linkages for farmers are already well established.

## **2. Project purpose**

### **Goal**

The goal of the Programme was to improve the livelihoods of poor livestock keepers in Ethiopia, Syria and Viet Nam in a sustainable manner through increased access to and adoption of fodder interventions.

### **Purpose**

With activities in Ethiopia, Syria and Viet Nam and linking with a project implemented in Nigeria and India, this Programme aimed at better understanding the factors and processes that determine the success of fodder interventions in developing countries. This understanding was used to strengthen the capacity of poor farmers and service providers to better meet their needs for fodder.

## **3. Project Outputs**

Using participatory approaches and considering a range of fodder options in pilot learning sites in the three countries, the Programme aimed to deliver the following outputs:

- Mechanisms for strengthening and/or establishing multi-stakeholder alliances that can enable scaling up and out of fodder technologies.
- Options for effective delivery systems including innovative communication strategies and on farm interventions to improve fodder supply.
- Enhanced capacity of project partners to experiment with and use fodder technologies through effective communication, technical information and training in diverse aspects placing fodder interventions in the context of systems of innovation.
- Generic lessons with wide applicability on innovation processes and systems, communication strategies and partnerships that provide an enabling environment to enhance scaling up and out of fodder innovations.

## **4. Collaborators and institutional affiliation**

### **Ethiopia**

**Ethiopian Institute for Agricultural Research:** Mr Seyoum Bediye chaired the Ethiopian Advisory Committee. Mr Taye Tadesse was main contact person for our work on multi-site testing of dual purpose sorghum.

**Tigray Agricultural Research Institute.** Dr Gebrezhiabher Gebreyohannes was our initial contact and we then had collaborations with a range of researchers for the rapid market appraisal exercise and for the ongoing work of the stakeholder platform in Alamata.

**Oromiya Agricultural Research Institute.** Mr Aliye Hussain was our initial contact and we then had collaborations particularly with Adami Tulu Agricultural Research Centre (Berhanu Shilima and subsequently Taha Mume) on rapid market appraisal and the various activities associated with the stakeholder platforms in Mieso and Ada'a.

## Syria

**Extension Directorate (ED SMAAR).** Stakeholder mobilization, networking, farmer training, scaling out and up, extension materials development, and on-farm data collection. Led by Dr. Mohammad Abdullah, Director of Extension, Syrian Ministry of Agriculture and Agrarian Reform (SMAAR), Damascus, Syria.

**Animal Wealth Research Administration (AWRA SMAAR).** Research, source of livestock management technologies, technical support and training on livestock production. Led by Mr. Adnan Assad, Director, Animal Wealth Resource Administration (AWRA), General Commission for Scientific Agricultural Research (GSCAR), SMAAR, Damascus, Syria.

**Universities of Aleppo, Damascus, and Tishreen.** Research and graduate training.

**Aga Khan Foundation (AKRSP).** Non-governmental partner, technology testing/dissemination, farmer training, and input provision e.g. loans/ micro-credit. Led by Mr. Ali El-Zien, Director, Aga Khan Rural Support Program (AKRSPAKRSP), Aga Khan Foundation, Salameih, Syria and Mr. Mohannad Obaido, Livestock Section Leader, AKRSPAKRSP, Salameih, Syria.

## Vietnam

**National Institute of Animal Husbandry (NIAH).** National coordination of project led by Dr Nguyen Thi Mui until her retirement in October 2009 and Dr Nguyen Ngoc Anh from November 2009 onwards (NIAH, Hanoi). Learning site coordinator for Ha Tinh: : Dr Nguyen Van Giang and Dr Nguyen Ngoc Anh, NIAH, Hanoi

**Tay Nguyen University, Buon Ma Thuot, Daklak.** Learning site coordinators for Daklak: Dr Truong Tan Khanh and Mr Van Tien Dung



## 5. Implementation strategy

With ILRI as the implementing agency, this Programme was managed through the System-wide Livestock Programme (SLP) of the CGIAR, with overall guidance provided by the Livestock Programme Group (LPG). The LPG is an inter-centre committee composed of representatives of eleven CGIAR centres that steers the SLP. An ILRI scientist, Alan Duncan, working closely with the SLP Coordinator coordinated the project. The project coordinator chaired the Programme Steering Committee which included the SLP coordinator, the country coordinators from Vietnam and Syria, one national representative from each country and an IFAD representative. The steering committee met once a year and functioned to provide general direction and oversight, and to ensure work plans were in place. A D-group web space was established for the Programme Steering Committee for document sharing and communication.

Programme activities in each country were implemented under the guidance and supervision of a Country Coordinator. Asamoah Larbi (ICARDA) assumed this role in Syria, Werner Stür (later Tassilo Tiemann) in Vietnam and Alan Duncan in Ethiopia. In each country the Programme had an Advisory Committee composed of representatives of partner organizations and local communities in pilot learning sites that was chaired by each Country Coordinator. The Advisory Committees met at least twice annually to provide a forum for agreement on country level implementation, site identification etc. and to review and provide feedback on work plans. IFAD representatives in the three countries were invited to participate in the meetings of the Advisory Committees.

At the local level, in each pilot learning site a coalition of partners from rural communities, NARS, civil society, the private sector, IFAD loan projects and other development projects, together with CGIAR centres were involved in programme implementation to varying degrees and according to country-specific models.

Part of the Programme implementation included developing synergies with the DFID-funded Fodder Innovation Project which was being concurrently implemented in Nigeria and India. Functional linkages were established between the two projects for cross-fertilization of ideas, information sharing and dissemination of lessons learned. This was achieved through establishment of a joint working group to explore opportunities for added value through collaborative outputs and cross-project learning events. Cross-project participation in workshops and meetings continued throughout the lifetime of both projects. A meta-analysis of innovation approaches across all 5 countries involved in the two projects was commissioned. These linkages added value to the results of the two initiatives and promoted south-south exchanges to enhance the capacity of actors involved in fodder innovations to meet the needs of poor farmers.

## In Ethiopia

In Ethiopia the project was implemented in close collaboration with the CIDA-funded Improving Productivity and Market Success (IPMS) project. The IPMS project adopted a value chain approach to commodity development and had strong elements of innovation thinking embedded in its design. In addition the project had a ready-made staffing infrastructure at ten learning sites around Ethiopia. Early in the project 4 of these learning sites were nominated as Fodder Adoption Project sites based on their potential for livestock development. These were Mieso and Ada'a in Oromiya Region and Alamata and Atsbi in Tigray Regions

Partner organizations for the ongoing activities of the project were selected on an ad hoc basis. For conventional research-based activities the project partnered with national research partners including the Ethiopian Institute for Agricultural Research (EIAR), Oromiya Agricultural Research Institute and Amhara Regional Agricultural Research Institute. Our main partners for the innovation systems activities were the local and regional offices of the Ministry of Agricultural and Rural Development. In addition we developed informal partnerships with an array of other livestock actors associated with the local innovation platforms. These included training organizations such as the Ethiopian Meat and Dairy Technology Institute, private sector players such as Eden Field Seeds, cooperatives such as Ada'a Dairy Cooperative, NGO's such as SNV Ethiopia and other projects such as the Land O Lakes Ethiopia Dairy Development Project.

In Ethiopia, we established an Ethiopian Advisory Committee which met twice a year to review project progress and to make recommendations on linkages with other national livestock initiatives. The committee was chaired by Ato Seyoum Bediye, Livestock Director of EIAR and had representation from regional research institutes, the Federal Ministry of Agricultural and Rural Development, Land O Lakes, IFAD and IPMS.

The key mechanism for project implementation was the establishment and mentorship of local innovation platforms in 3 of our pilot sites. These were loose associations of relevant actors and met 3 or 4 times per year and more frequently as sub-groups on specific topics. The innovation platforms jointly identified constraints to feed supply and worked together to deal with these constraints. Meetings generally took the form of a participatory review and updating of rolling action plans.

Research agreements were drawn up for various diagnostic research activities and for experimental work. These included rapid market appraisals early in the project and a multi-location testing programme for imported dual purpose sorghum lines.

## In Syria

Partner institutions and sites were selected during multi-stakeholder national, provincial and local start-up workshops involving farmers' group, research and development partners and

decision-makers in the public and private sector. El-Bab, Salameih and Tal-Amri in Homs, Hama and Aleppo provinces respectively, were selected as pilot learning sites using provincial spread, sheep population, partner availability, and market access as selection criteria. A National Advisory Committee (NAC), responsible for the overall management of the project was established. A Site Advisory Committee (SAC) made up of representatives of farmers' groups, district extension and research divisions, and ICARDA's assistant project coordinator was established at each site. The SAC was responsible for supervising site activities including developing work-plans and budgets, implementing and monitoring of activities, identifying training needs, organizing field days, as well as data collection in consultation with the project coordinator. The NAC met 2-3 times per year, while the SAC met every 3-4 weeks. Work-plans for each pilot learning site were consolidated to form a national work-plan in each project year. Annual meetings were held to present and discuss project results from each site. Linkages with Universities of Aleppo, Damascus and Tishreen allowed graduate students to use some project activities for their dissertation research.

### **In Vietnam**

In Vietnam two institutions were selected as national main collaborators before proposal submission: The National Institute of Animal Science (NIAS) and Tay Nguyen University (TNU). NIAS was chosen as national coordinator given its strategic role as a livestock focused research institution in Vietnam and its good connection to governmental bodies. TNU was chosen as one of the most experienced partners to support the project in providing and improving forage technologies.

At learning sites, the project team consulted extensively with the provincial and district governments to ensure that the project goals were fully aligned with the goals of local governments. This was followed by stakeholder analyses to identify key partners for the project. In Ea Kar, the Agricultural Extension Office was nominated as the key partner of the project. In Ky Anh, the Office of the Department of Agriculture and Rural Development was nominated for this role. Additional partners (e.g. commune extension service, commune governments, traders, local banks, farmer groups and women's union) joined the project and formed the 'coalition for cattle development'. The more advanced site Ea Kar served as example for partners from the new site Ky Anh and greatly motivated partners and provided a vision for farmers at the new site. TNU was asked to take responsibility of managing the learning site in Ea Kar and NIAS took responsibility for managing the learning site in Ky Anh. An Advisory Committee was established at the beginning of the project and included senior management of NIAS, TNU, CIAT and representatives of the provincial and district governments and the IFAD loan project. Planning and review meetings took place once a year alternating between sites: 2007 in Ha Tinh, 2008 in Đắk Lắk, 2009 in Ha Tinh and 2010 in Đắk Lắk. All relevant partners and the advisory committee were invited to join these reviews including project managers from NIAS and TNU, local staff and representatives of the involved extension services and farmers groups.

## 6. Implemented work programme and results per output and activity

### Output 1. Mechanisms for strengthening and/or establishing multi-stakeholder alliances that enable scaling up and out of fodder technologies

#### Identification of project sites, partners and work plans

This activity was about establishing learning sites and working relationships with key partners at local level. There was considerable variation across project countries in how this was achieved. This partly related to the different national contexts and partly to the place of FAP within the evolution of ongoing research programmes of the lead CGIAR institutions. As can be seen from what follows, a range of criteria were used to select sites including the importance of livestock within the farming system, the extent to which previous partnerships could be built upon, the links with ongoing IFAD projects, local political factors and extent of market orientation. The resulting set of learning sites was diverse and provided a useful learning ground for looking at the how context influences innovation.

#### *Ethiopia*

The project activities in Ethiopia built upon an ongoing project, *Improving Productivity and Market Success of Ethiopian Farmers* (IPMS) which was being implemented in 10 pilot learning sites across the country. IPMS was an Ethiopian Ministry of Agriculture and Rural Development project, implemented under ILRI's leadership in collaboration with national organizations and other CGIAR centres. **Identification of project sites** was therefore conducted in consultation with IPMS. Four out of the ten IPMS pilot sites, where livestock fodder related activities had been initiated, were identified to be the focus of activities for the Fodder Adoption Project. The IPMS project had already initiated interventions in fodder and feed activities (including capacity building of various actors in technical aspects) related to needs based on site-specific livestock market opportunities. These interventions lacked a common framework for implementation, priority setting and comparison. It was in this context that FAP, and its broader links to both studies in other countries and the innovation systems framework through the DFID-FIP project engaged to assess feed systems but also to include dimensions of investigating key actors, institutional capacities and arrangements to enable cross-site comparisons and syntheses.

The inception period was used to visit a number of IPMS sites, interact with IPMS and other partners and assess the opportunities for the two projects to work synergistically in the area of fodder innovations. In this context the four IPMS sites were visited, Atsbi, Alamata, Ada'a and Mieso. There were a number of common features from the four locations, which have helped to shape the work plan for FAP. These included the need for ways to assess the available feed resources at different times of year and strategies to tailor these with the demand for livestock products. An additional dimension to this was to explore, in relation to the feed gaps, where

there are opportunities for introduced feeds, and to conduct an analysis of innovation capacity to identify the appropriate links needed for such fodder options to become available and be adopted by farmers.

### *Syria*

Project sites and partners were identified through multi-stakeholder consultations and start-up workshops at national, provincial and local levels. Participants included farmers' group, research and development partners, and decision makers (policy makers, investors, directors) of public and private agencies related to fodder/livestock. A national start-up workshop was held at ICARDA's headquarters, Aleppo, in February 2007. Participants included directors of Extension, Planning and Statistics, Animal Production, Animal Wealth Research Administration, General Organization for Fodder, General Organization for Seed, and Agricultural Cooperative Bank divisions of the Syrian Ministry of Agriculture and Agrarian Reform (SMAAR); Aga Khan Rural Support Program (AKRSPAKRSP), and Farmers' Union.

Six invited papers were presented to review the feed/livestock industry in Syria, namely: 1) Livestock wealth and feed needs, 2) Livestock feed industry, 3) Fodder seed production, processing and marketing, 4) Communication and delivery systems for fodder/livestock feed, 5) Policy and institutional options for small-scale fodder/feed enterprises, and 6) Agricultural credit and loans for small-scale fodder/livestock enterprises. Aleppo, Hama, Hasake and Homs provinces were selected for implementation using sheep population, availability of effective research and development partners, and market access as selection criteria. In addition, site selection took into account the need to spread project activities across provinces. A 5-member National Project Advisory Committee (NAC) was established, with representatives from ICARDA (Director of Diversification Program and the Syria FAP Project Coordinator), MAAR (Directors Extension and Animal Wealth Research Administration), IFAD (Country Representative), AKRSPAKRSP (Director of Rural Support Programme), and Agricultural Cooperative Bank.

The national workshop was followed by provincial workshops to select project sites, and local or site workshops to introduce the project to stakeholders at the selected communities. El-Bab, Salameih and Tal-Amri in Homs, Hama and Aleppo provinces respectively were identified as pilot learning sites. Pilot Site Advisory Committees (SAC), made up of representatives of farmers' groups, district extension and research divisions, and ICARDA's assistant project coordinator were established at each site. The SAC was responsible for developing site work-plans and budgets, implementing and monitoring activities, identifying training needs, organizing field days, and data collection. Following the start-up workshops, work-plans were developed that incorporated the suggestions of local stakeholders. Each year, work-plans from the learning sites were consolidated to form a national project work-plan.

### *Vietnam*

The project was implemented at two sites, one in the southern central part of Vietnam, Ea Kar district, Daklak province and one in the northern central part, Ky Anh district, Ha Tinh Province. Ea Kar was selected because of a favourable political environment at district level and positive

experiences from a previous forage project (LLSP) in 2000-2005, in which many farmers had already participated in using forage for cattle feeding and had had good experiences as to the impact of forages on their animals, their livelihoods and the environment. Ha Tinh was selected as a new site and was embedded in the IFAD loan project 'Improving market participation of the Poor' (IMPP). The IFAD loan project facilitated consultations with the provincial government and proposed Ky Anh as a project site. Ky Anh is located near the main north-south highway and as such had good potential for livestock marketing. The local government had identified cattle development as an opportunity for economic development of the district. The presence of IMPP provided an opportunity to link activities of both projects and to allow research outputs to feed into development activities.

### **Evaluation of actors, linkages, practices and habits related to fodder innovations**

This activity aimed at building a picture of stakeholder dynamics at the project learning sites through assessment of various elements of "innovation capacity". The framework for this diagnosis built upon the World Bank 4-Element Tool for characterizing innovation capacity (although the 4<sup>th</sup> element, the policy environment, was addressed as a separate activity). The way in which this activity was interpreted in different country contexts was somewhat variable. However, some commonality of approach was aided by an early workshop organized in Ethiopia which helped project personnel to get to grips with innovation theory. As a project we wrestled with "innovation thinking" from the outset but there was a gradual convergence of thinking helped by joint development of a conceptual framework early in the project.

#### ***Ethiopia***

A training course entitled "Understanding Fodder Innovation" was held in Ethiopia in April 2008 bringing together participants from each of the project countries. Trainees were exposed to various existing tools for innovation system diagnosis. Following this, a rapid diagnosis of innovation capacity at the 4 Ethiopian learning sites was conducted early in the project. The results of this diagnosis indicated the dominant role of government line departments in rural development in Ethiopia. This has both positive and negative implications; positive in that there is a well developed extension and rural development institutional infrastructure which, well handled, could lead to development impact at wide scale; negative in that many of the rules and norms by which public actors currently operate can stifle rather than enhance innovation. As well as providing an overview of the existing situation in each study site, the innovation capacity diagnosis was useful in establishing contact with key local actors and building relationships early in the project. It was out of these early contacts that local innovation platforms were established at each of 3 project sites. A journal article presenting results of the formal diagnosis and subsequent action at local level has been prepared.

Later in the project we continued to monitor changes in actor configuration and practices through a "change log" which systematically captured emergence of new actors in the stakeholder platform, changes in behaviour of existing actors and changes to the enabling

environment. We plan to repeat our innovation capacity diagnosis post-project to allow changes to be assessed. We have prepared a paper on this diagnosis which is soon to be submitted for publication.

### *Syria*

The Actor Linkage Matrix methodology was used as an analytical tool to evaluate actors, linkages, practices and habits related to fodder innovation at the project sites. The objective was to provide insights into the quality of interactions among the various actors, and to identify constraints and opportunities that would enable better development, adaptation and use of feed/fodder options. Preliminary meetings and interviews were held with potential actors to document their roles and interactions.

At the start of the project, active actors in the fodder/livestock innovation at Salameih were identified as farmers, traders and staff of public extension and research, ICARDA and AKRSP/PAKRSP. At El-Bab, active actors were found to be farmers, traders, the local extension office and ICARDA; at Tal-Amri we identified the key actors as farmers, traders and extension staff. Regarding actor roles, these were catalogued as follows: farmers produced fodder and livestock; traders marketed feed/fodder, sheep, and milk; AKRSP staff trained farmers, disseminated technologies, and provided inputs such as loans and micro-credit; extension staff trained farmers and disseminated improved fodder/livestock options; research staff provided training and improved options for fodder/sheep production; ICARDA staff provided international research expertise on forage/livestock, and improved forage varieties. The diagnosis revealed that there was a weak interaction and lack of trust between staff of AKRSP and the national research and extension system at Salameih. We also noted weak links between farmers and extension staff at El-Bab.

The project strengthened linkages, and built trust among extension and AKRSP staff at Salameih. At El-Bab AWRA research staff became more active; a strong linkage was established between ED staff and farmers, and between farmers and traders. Staff of AWRA and ICARDA staff became active at Tal-Amri. In general, ICARDA assumed additional responsibility of coordinating stakeholder platforms. Women's groups were allowed to participate in project activities.

### *Vietnam*

A strong emphasis was placed on ensuring that project activities were locally 'owned' and managed. Embedding project activities within (and affecting) local government programs and ensuring that key stakeholders had an opportunity to contribute and participate in project activities was a key strategy of the project in Vietnam. This resulted in a 'coalition for cattle development' at each learning site. Local government and other key informants were consulted to identify local stakeholder groups and individuals, who were then invited to start-up workshops. Stakeholder analyses were conducted at both learning sites to identify key stakeholders affecting fodder and livestock development, analyse their interests, influence and linkage. This analysis assisted the project in forming local project teams that included key partners and ensured that appropriate stakeholder were involved in all project activities. To



improve the project efficiency, it was focussed on strengthening linkages with related government and donor-funded development projects in other districts in Daklak province and to researchers and research projects in other areas in Vietnam including agreements with the IFAD funded IMPP.

### **Development of Geographical Information Systems on pilot sites in relation to fodder interventions**

The thinking behind this activity was to use GIS to develop suitability maps for promising feed options based on similarity of conditions between learning sites and other geographical areas. The idea was then to develop recommendation domains for scaling out of fodder options. In none of the countries was this idea developed to any great extent. Maps were produced but only to a limited extent. This partly relates to the evolving thinking within the project: moving from a paradigm where agro-ecological conditions are the main determinant of fodder adoption to one in which markets and institutions are dominant drivers of uptake.

#### ***Ethiopia***

GIS maps of the Ada'a, Alamata and Mieso sites were produced showing the location of households in which fodder had been introduced. In Ethiopia the original objective of producing agro-ecological suitability maps was not pursued to any great extent. The reasons for this relate to the evolving nature of the project and the paradigm on which the project was based. The initial idea had been to draw up suitability maps to indicate how successful fodder options could be scaled out to other areas with similar agro-ecology. This idea was based on the hypothesis that the success of scaled out technologies was primarily determined by agro-ecology. As our thinking developed we began to see that although agro-ecology is an important condition for successful scaling out, there are other more critical social, institutional and market-related issues that are more constraining and that these were difficult or impossible to map. We therefore focused our efforts on understanding these issues without feeling a need to attempt to map them.

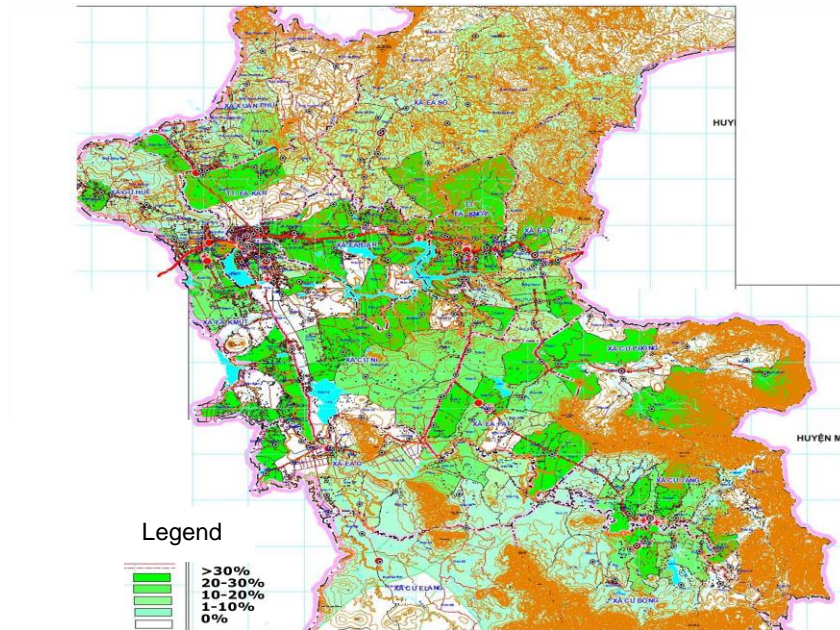
#### ***Syria***

Existing GIS information on the project sites was reviewed. The Salameih site had well advanced GIS maps developed by AKRSP which were used to develop fodder related basic GIS maps. In order to integrate production data into the GIS databases and maps, production cost of barley, vetch, grasspea and narbon vetch for grain and straw, as well as GPS data were collected from 90, 65 and 25 farms at in Salamieh, El-Bab, and Tal-Amri respectively.

#### ***Vietnam***

A GIS system was developed in Ea Kar to assist with the analysis of forage adoption patterns in 2007. Adoption maps assisted in identifying low-adoption areas and these were related to social, farming system and economic factors (Figure 1). This analysis has led to a suite of targeted interventions in 2008. One example is the stronger focus on indigenous farmers in three villages in Cu Ni commune (Ea Sinh, Ea Knop and Ea Pal village) where adoption of cultivated fodders was extremely low. In Ky Anh, the project assembled basic GIS information

and produced maps, which can be used to add fodder-related information collected by the project. GIS maps are available for both project districts. But, as in Ethiopia and Syria the project team in Vietnam felt that agro-ecological suitability maps would be of little value.

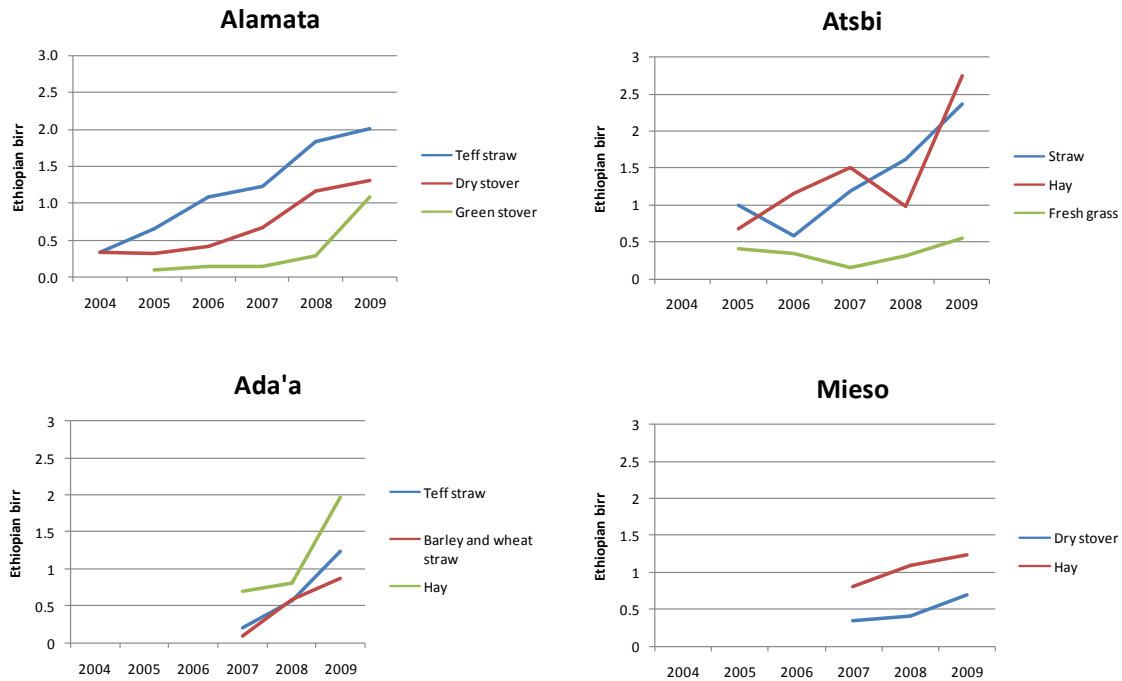


**Figure 1. Forage adoption in Ea Kar, 2007**

### **Evaluation of livestock market environment influencing fodder demand, access and utilisation**

An important strand of FAP was the recognition that markets for livestock products play an important role in farmer decision making about feeding strategies. Farmers are more likely to invest land and labour in fodder production if it is profitable to do so and this depends on their ability to sell meat and milk easily. To this end we undertook a number of market evaluations across the project countries. These included market evaluations for livestock products as well as intermediate markets for fodder itself since fodder markets tend to grow as smallholder livestock production commercializes. Another strand of FAP were participatory market studies involving farmers, local traders and other key stakeholders which improved farmers' (and other participants) understanding of markets and market demand, and provided a vision of what they needed to do to connect to these markets.

### **Ethiopia**

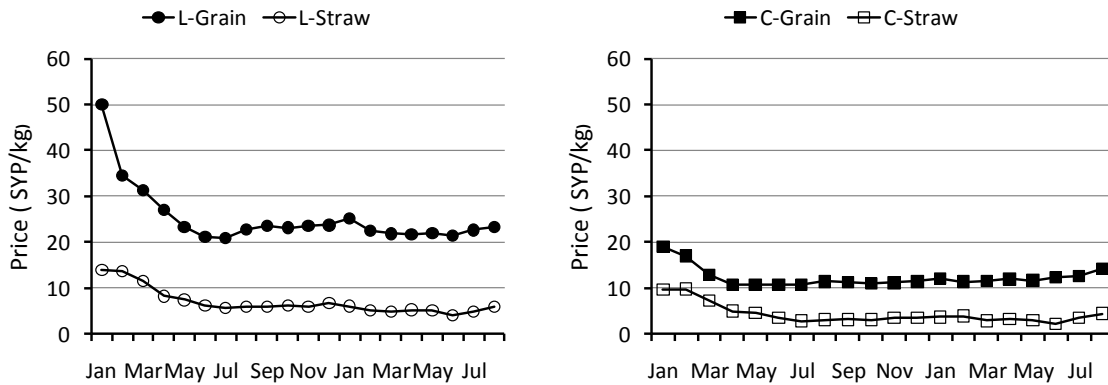


**Figure 2 - Indicative prices for different fodder types in the study woredas in Ethiopia. Prices are adjusted for inflation figures published on [www.indexmundi.com](http://www.indexmundi.com)**

Ethiopian partners were trained in Rapid Market Appraisal (RMA) methodology along with colleagues from Syria and Vietnam in 2008. Training was provided by CIAT. RMA designs were developed and rapid market appraisals on fodder as a commodity were undertaken by Ethiopian regional research partners in Tigray and Oromia Regions in 2009. The Tigray study revealed a nascent but rapidly developing fodder market manifested by rapidly rising prices for fodder since 2005 and increased informal exchange of fodder resources among smallholders in the region (Figure 2). A parallel exercise was conducted in Oromia Region. Reports of our rapid market appraisal for fodder were completed and a paper was presented at the 5<sup>th</sup> All Africa Conference on Animal Agriculture in Ethiopia in Sept 2010. The 3<sup>rd</sup> Ethiopian Fodder Roundtable meeting was convened on the topic: “Linking Fodder Production with Commercial Livestock Production”. Monthly fodder market data was collected on a monthly basis at 3 prominent market sites for 18 months.

### *Syria*

Fodder markets at the El-Bab and Salameih pilot sites were studied in order to understand market incentives for producers, identify constraints in the production to market chain, and opportunities to improve market participation of farmers. Group and individual discussions were held with forage producers and traders. Market prices of cereal and legume grains and straws, and agro-industrial by-products were monitored monthly.



**Figure 3 - Seasonal change in retail prices of (left) forage legume grain and straw and (right) cereal grains and straw at El-Bab, north-west Syria (January 2009-August 2010)**

Fodder/feed markets are well developed both in the private and public sectors. Key actors in the feed/fodder markets at the national level include public agencies such as the General Organization of Fodder and General Establishment of Cereals, which procure, store and market feed to farmers through the Peasants Federation. The central government controls feed import and export permits, and market prices of strategic crops such as barley, wheat and cotton.

At local level, producers (seed, sheep), feed processors, traders (livestock, feed/fodder), and staff of extension and research services are the main actors. Fodder supply and use are driven by several factors including: availability of land and water, availability of forage seed, market conditions, competition with cash crops, prices of lambs, as well as annual distribution and amount of rainfall. Prices of key feed resources, especially cereal and legume grains and straws varied seasonally with generally higher prices in winter (Figure 3). As a strategic crop, government controls production and distribution of barley grains to farmers. In contrast, the private sector produces and markets non-strategic (those not governed by national policy) feeds/fodder crops e.g., common vetch, narbon vetch, grasspea, alfalfa, corn and sorghum.

### **Vietnam**

Cattle market appraisals were carried out in both Ea Kar (2008) and Ky Anh (2009) to gain a better understanding of the constraints and opportunities for smallholders to access provincial and city markets. The studies followed the Rapid Market Appraisal (RMA) method developed by CIAT and used in the FAP. The surveys were carried out by the local project teams with support from TNU and NIAS. The studies provided a clear picture of the way cattle were traded at the time and an example of a market chain is presented in Figure 4.

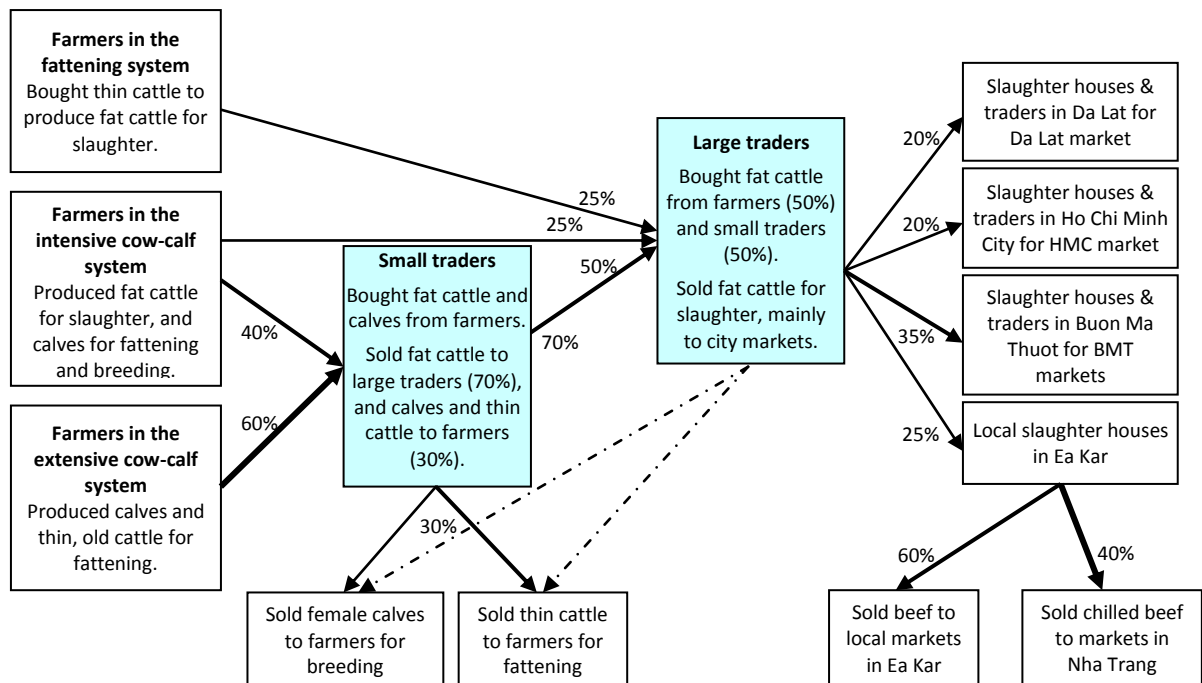


Figure 4. Market chain of cattle traded in Ea Kar, drawn by the trader group

To raise a better understanding among farmers of the problems faced by other stakeholders in the market chain, these studies were followed by a participatory market study visit in early 2009 including representatives of farmer clubs, traders and extension workers from Ea Kar. Visiting slaughter houses and livestock markets in Dalat City, one of the destination markets for high-quality cattle from Ea Kar, participants identified demand (in terms of quantity and quality) for cattle and beef and evaluated opportunities to improve their competitiveness in this important market. They established contacts with traders in Dalat and, in return, Dalat traders visited Ea Kar in November 2009 to discuss options for cattle supply contracts for farmers in Ea Kar. A first contract had been established between farmer fattening groups and a large cattle trader from Dalat, specifying the number of cattle with a minimum weight, maximum age and range of body condition to be supplied each week. In return, the trader guaranteed a minimum price per kg live weight for the next 3 months. This arrangement ensures regular supplies of high-quality animals for traders who need to arrange full truckloads of animals at any one time, and higher prices for farmers because of lower transaction costs.

## **Output 2 Options for effective delivery systems including innovative communication strategies and on farm interventions to improve fodder supply**

### **Innovative approach for evaluation of year-round feed inventory, assessment and database**

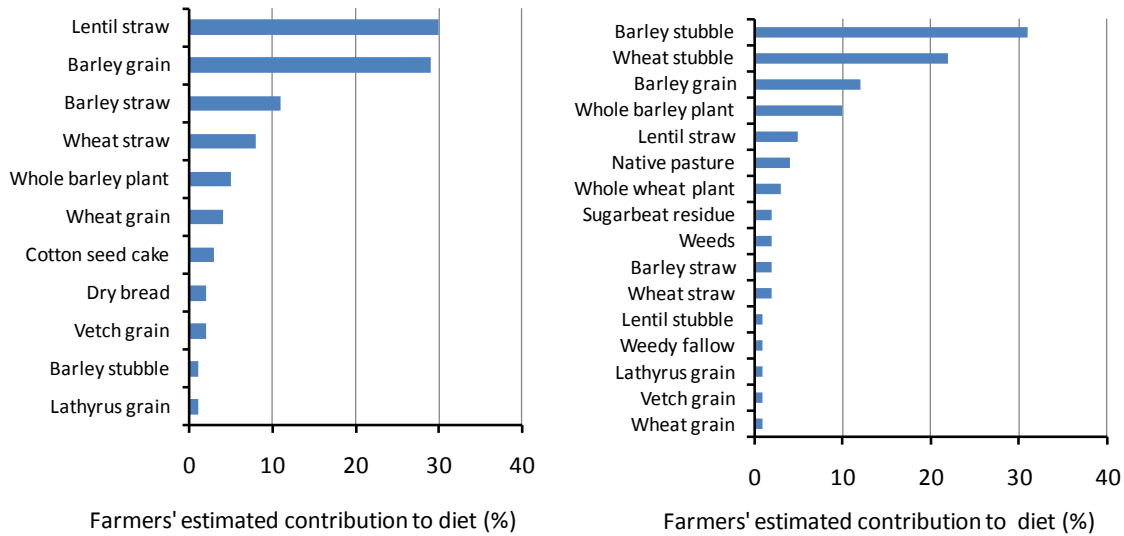
In seeking to deal with feed scarcity issues, there is often an information gap on what feeds are currently available and how they are being used; how feed availability varies seasonally and what farmers perceive the main feed problems to be. Formal surveys are of limited benefit to address this information gap since they are cumbersome to administer and often the information they provide comes too late to inform feed interventions. The project therefore experimented with rapid methods of assessing feed resources. The idea here was to develop rapid feed assessment tools that could be used by development practitioners to assess feed resources quickly and come up with some first ideas for feed interventions based on some systematic evidence.

#### ***Ethiopia***

To bring together ideas on feed assessment methods, a cross-project workshop led by the Ethiopian component of the project was organized and held in Hyderabad, India, in June 2009 to develop and validate a simple tool for diagnosing feed scarcity issues at village cluster level to assist in planning of interventions. A prototype tool was developed and has continued to evolve over the project lifespan. The Feed Assessment Tool (FEAST) has been tested in various locations for FAP and other projects including in India, Nepal, Bangladesh, Ethiopia and Kenya. Preliminary validation of the tool shows its usefulness as a systematic method of combining PRA style approaches with quantitative data on feed issues to inform intervention strategies. Considerable interest has been shown by other projects for use of FEAST and following further refinement we will publicise a public version. A website providing information and previous FEAST reports has been developed (<https://sites.google.com/a/cgxchange.org/feast/home>)

#### ***Syria***

In Syria, a review of methods used to estimate feed demand and supply was conducted. Approaches to estimation of year-round feed supply were discussed with research and development partners. It was agreed to use group and individual discussions to record year-round feed inventories. Accordingly, a simple tool to assess year-round feed inventory was developed and tested at El-Bab in 2008. The tool was refined and used at El-Bab and Salameih in 2009.



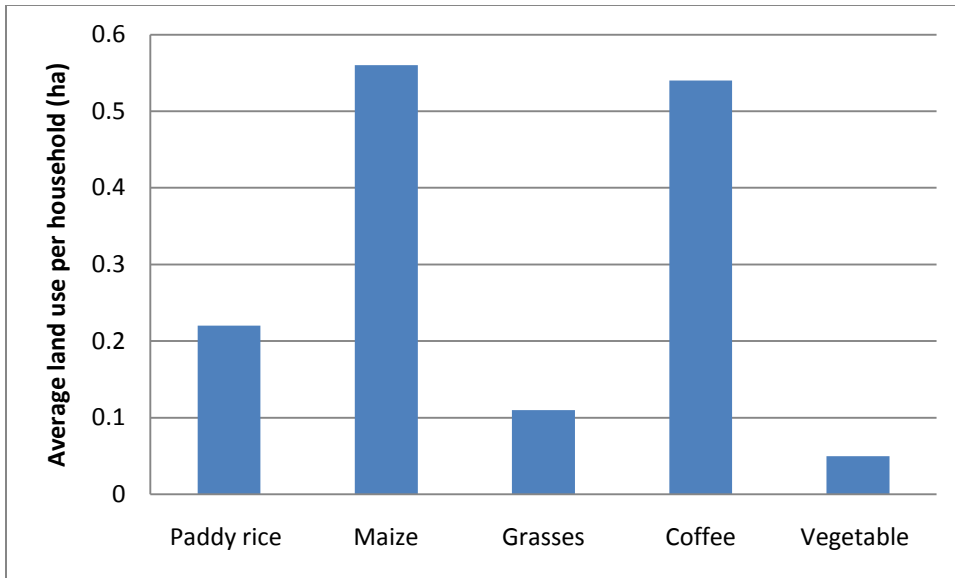
**Figure 5 - Farmers' estimated contribution to animals' diet in summer (May-June), El-Bab, Syria.**

Farmers' estimates of the percentage contribution of different feed resources to the diet of sheep varied with season (Figure 5). Feed gaps were evident during early spring and winter. There was heavy reliance on cereal residues and/or stubble in summer and straw and barley grain in winter.

**Vietnam**

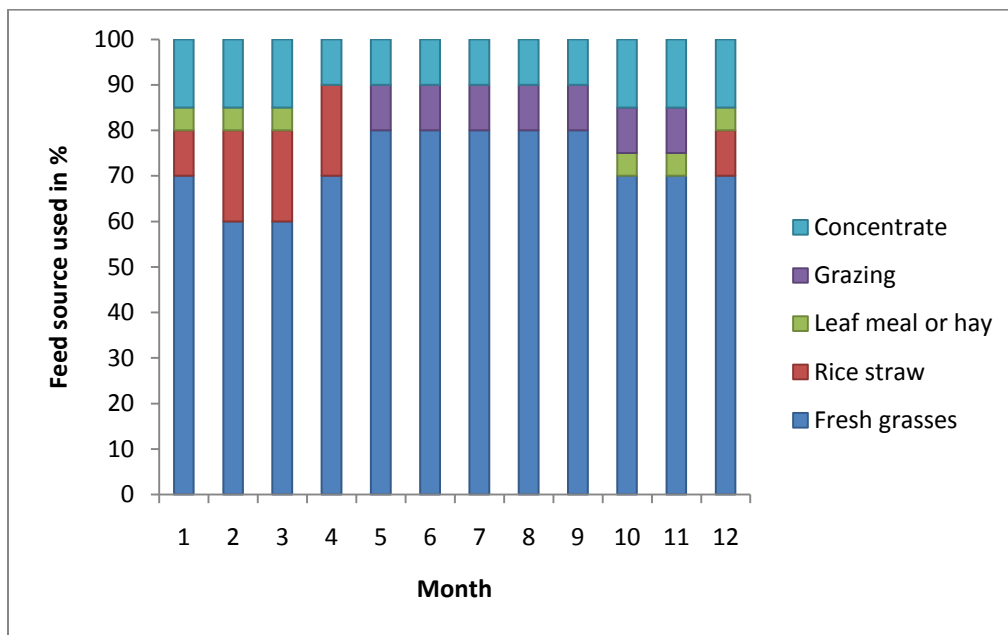
The Feed Assessment Tool (FEAST) was tested in 2010 in Dak Lak and Ha Tinh in an Asian context with the objective of evaluating its suitability in assessing available local feed resources and the implemented intervention strategy to mitigate feed deficiencies and improve feeding systems. In Dak Lak the evaluation was carried out in Chu Cuc village where upland mixed crop/livestock systems with an average agricultural land size of about 0.75 ha/HH (0.3 to 3.5 ha/HH) are the dominant agricultural system. The analysis revealed that forage grasses were amongst the major crops in terms of cultivated area (Figure ). This was surprising as cattle production has developed only in the last 10 years after the introduction of forages in a former CIAT led project.





**Figure 6 - Average Land use in ha per household in Chu Cuc village, Vietnam**

The assessment showed that currently 40 out of 60 households keep cattle and plant forages. Farmers fattening cattle sold 3-4 cattle per year after a 5-6 months period of ad libitum feeding. All farmers keeping cattle cited beef cattle as their most important income resource, accounting for about 60% of their total annual income. Coffee and maize were the main income sources for farmers without cattle. FEAST helped further to identify the main feed resources used throughout the year, identifying grazing, in contrast to traditional systems, as almost insignificant for these smallholders. Fresh grasses on the other hand, were revealed by FEAST to be the dominant feed resource in beef feeding systems (Figure 6).



**Figure 6 - Feed resources for cattle throughout the year in Chu Cuc, Vietnam**

The main constraints identified were the lack of grasses with good growth in October and November, lack of feed storage technologies, limitations of the artificial insemination service, insufficient knowledge in animal nutrition and market oriented cattle production, and limited linkages to other actors in the market chain.

The tool itself was assessed as helpful in describing feed resources and seasonal feed scarcity, and identifying potential solutions for overcoming feed constraints. Its simplicity and ease of use were appreciated. Minor changes were suggested, as some questions were too complex or could not easily be answered by farmers.

### Collection of baseline data

A range of baseline socio-economic data were collected in each project site across all three study countries early in the project to give an overview of the livestock production system, current feeding practices, levels of production, connections with markets etc. This data was useful within country although in retrospect a harmonized household survey across all study sites would have yielded stronger data and helped to draw study country agendas together. Never-the-less some useful data were collected and these will form a useful baseline for monitoring long term change in project sites after project lifetime. There was no attempt to revisit the study sites for an impact survey at the end of the project since it was felt that the innovation processes catalyzed by the project had not fully matured and that a later survey would make more sense.

### Ethiopia

Household baseline data on livestock management and feeding practices were collected from a total of 560 households in 3 sites. Findings showed a near absence of livestock with improved genes at study sites, minimal marketing of livestock products and a high proportion of feed resources being used to support draught animals. A similar survey was applied to target households where forage interventions are being implemented as well as to matched control households. The total number of households surveyed was 156. As the project evolved the emphasis on household data reduced since the main focus for project activities was at the level of local stakeholders and the processes that characterized their action and interaction. This being the case, we focused more effort on collection of qualitative baseline data on stakeholder behaviour and interaction than on the quantitative aspects of household management at household level (see *Evaluation of actors, linkages, practices and habits related to fodder innovations*). However, we do have a household database which will prove useful to assessing impact and change in livestock feeding practices in the future.

### Syria

Rapid rural appraisals and formal surveys were conducted to record land and livestock ownership, sources of household incomes, production objectives and constraints, market access and management practices related to fodder and livestock. Two hundred and forty-six households at the project sites were interviewed - Tal-Amri (22), El-Bab (69) and Salameih (155).

Average land size at Tal-Amri ( $1.19 \pm 0.96$  ha) was smaller than El-Bab ( $9.1 \pm 2.58$  ha) and Salameih ( $35.4 \pm 4.78$  ha). The average household flock size at El-Bab ( $39 \pm 7.1$ ) was lower than Tal-Amri ( $109 \pm 10.7$ ) and Salameih ( $71.2 \pm 10.3$ ). Nearly 25% of farmer interviewed at Salameih owned cattle, compared with less than 7% at the Tal-Amri and El-Bab sites.

The survey showed that livestock production systems are changing from extensive grazing to semi-intensive and intensive fattening and dairying systems based on zero grazing. Livestock provided about 24-33% of household income for crop-livestock farmers and about 76-82% for pastoral families. Rangeland and crop residue grazing were the main feed resources. Grain barley, bran and cotton seed cake were the most important feed resources at all sites. Purchase of feed from government sources and market (86% of farmers) was the main access to feed, but 55-67% of farmers also cultivated fodder crops to produce additional feed. About 65-80% of the farmers interviewed considered high feed cost as the main constraint to livestock production. Procurement of feed/fodder accounted for 60-80% of the cost of production in small-scale lamb fattening and dairy production systems.

Rainfed barley, common vetch, grasspea, and narbon vetch, and irrigated alfalfa, and summer crops such as maize and sorghum were the main fodder crops. According to survey results scarcity of land, water, quality forage seed, productive and water-efficient forages, competition with cash crops, high labour cost, and centralized government crop allocation constrained fodder production.

About 83-90% of the farmers interviewed were cooperative members. Government policies supporting fodder/livestock production include: subsidized loans and feed, free veterinary services such as vaccination, investment in water development and feed banks for drought years.

## **Vietnam**

Several production and market surveys were carried out to guide project implementation and provide a baseline for impact assessment in Vietnam: In Ea Kar, the project carried out two forage adoption and cattle production surveys (2007 and 2010), a rapid market appraisal (2008) and a participatory market study (2009). In Ky Anh, the project carried out participatory diagnoses at project sites (2007), a household baseline survey (2007-8), a cattle production survey (2009) and a rapid market appraisal (2009).

The Ky Anh baseline survey gathered detailed household and land use information to characterize production systems, income sources, age and gender distribution, education levels and access, and many more. It identified the range of cropping and livestock systems in which cattle were kept for multiple purposes including draught, breeding and fattening for sale. The majority of production systems used extensive free grazing, low input cut and carry approaches and collection of forest derived herbs, leaves and tubers to support traditional low input production systems using local breeds. Labour requirements were high in these production conditions and presented a significant constraint to expansion of livestock production.

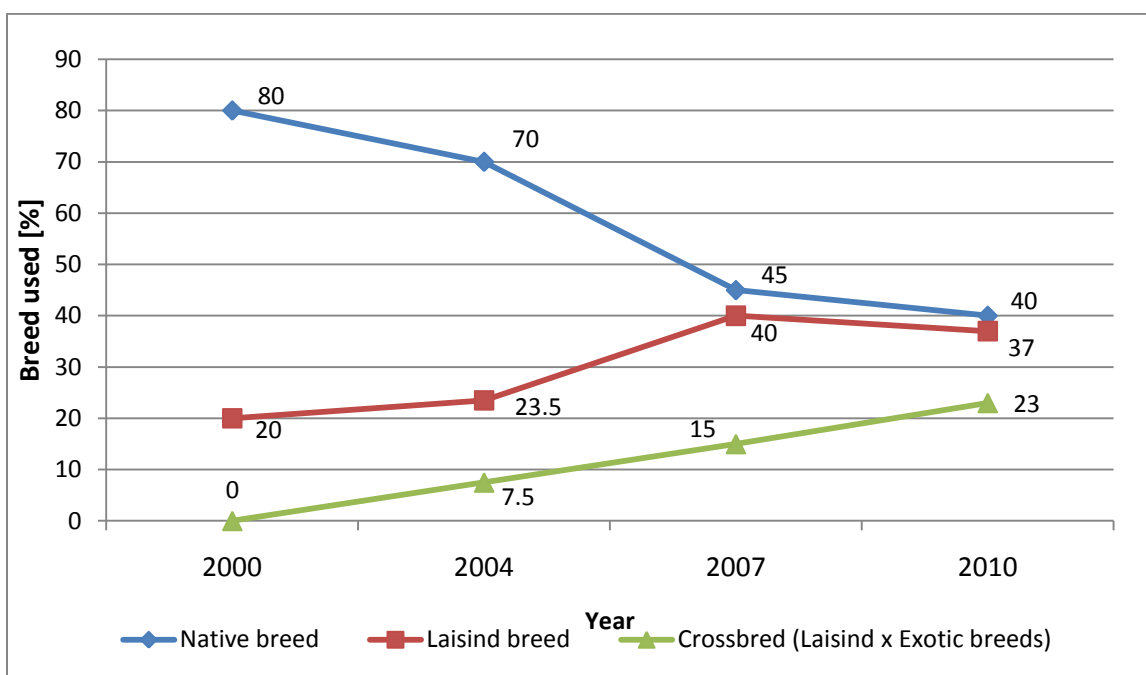
Furthermore, the absence of improved breeding systems and negative selection caused by selling the best animals for slaughter and using the poorer ones for breeding was likely to depress cattle production.

The Ea Kar cattle production survey compared the different cattle production systems that had developed in the project area. Three production systems were identified. These were (i) traditional extensive grazing system, (ii) cattle fattening and (iii) improved calf production (Table 1).

**Table 1- Feed resource use in the 3 main cattle production systems in Ea Kar**

| Cattle production system                                   | Fresh forage grass   | Concentrates (kg)                                       |       |           |           | Grazing (hr/day) |
|--|----------------------|---|-------|-----------|-----------|------------------|
|  |                      | Cassava meal  | maize | Rice bran | Fish meal |                  |
| Cattle fattening (for an animal weighing > 250 kg)         | 31.2                 | 1.04  | 0.95  | 0.77      | 0.12      | 1.7              |
| Improved cow-calf production (for a cow weighing > 250 kg) | 22.3                 | Supply only at the end of gestation and early lactation |       |           |           | 3.75             |
| Extensive cattle production                                | Only at calving time | -   | -     | -         | -         | 8.5              |

Rapid market appraisals carried out as part of FAP clearly showed the change in market chain and production systems in Ea Kar during the past 5 years. In 2004, almost all cattle produced in Ea Kar were only sold on the local market (RMA conducted in previous LLSP project). By 2008 the RMA conducted by the FAP showed that most beef cattle were now sold to most big city markets in South Vietnam including Da Lat, Nha Trang and Ho Chi Minh City. This was only possible because the quality of beef from Ea Kar met the trader and customer demands in these new markets by using improved production systems. Many farmers had changed from the traditional extensive grazing system to growing their own fodder and housing and feeding animals in pens. This was accompanied by a change from local to the larger Laisind and cross-bred cattle (Figure 7). In 2000 only three farmers practiced cattle fattening and no farmers raised crossbred cattle; by 2009 more than 500 farmers fattened cattle for city markets and approximately 800 farmers practiced improved cow-calf production to produce Laisind and cross-bred calves for sale or fattening. By the end of the FAP more than 3000 farmers had adopted fodder production in Ea Kar.



**Figure 7 - Increasing use of more demanding breeds with higher productivity in Ea Kar, 2000-2010.**

All farmers raising crossbred animals housed them in pens and fed them cultivated grasses planted in small plots near their houses. Reasons cited for this shift were the strict quality requirements of city meat markets requiring relatively young animals with high body weight and a particular body score condition. These are easier to achieve with larger crossbred animals, which on the other hand require much more and better quality feed than native breeds. Cultivated forage plots were the solution to provide this higher amount of high quality feed. It also enabled farmers to keep cattle in pens permitting better health care and the use of artificial insemination. An analysis of total animal numbers showed that these changes had led to a perception change and that cattle were increasingly used to generate regular income rather than keeping them as an asset. While the cattle population remained stable, the number of animals sold by farmers in Ea Kar increased from 8000 animals in 2004 to more than 15,000 animals in 2009.

In Ky Anh, evaluation of forages expanded from 23 farmers in 2008 to 90 farmers in 2009 and 485 farmers in 2010. While new farmers tend to plant forages on 100-150 m<sup>2</sup>, many farmers already expanded their forage areas to up to 700 m<sup>2</sup> after the first season. Although the majority of forage plots are small and can only provide supplementary feed, some farmers planted areas of 700 – 1,200 m<sup>2</sup>, suitable for engaging in cattle fattening. On-farm experiments were carried out to evaluate the benefit of planted forages for stall-fed cattle for fattening. In the first trial the use of planted forages increased weight gain of cattle from 437 g/day for cattle

fed native grasses + local concentrate to 619 g/day for cattle fed planted grass + the same amount of local concentrate. This result has generated interest among farmers to grow on-farm fodder and further farmers have started with forage-based cattle fattening.

After establishing successful technologies cross-visits and particularly Village Learning Activities have developed into the main extension learning tools used in the project. The general process was as follows:

- Field trials with farmer clubs
- Participatory evaluation of the experiments by extensionists and farmers to select the best options under their conditions
- Training of extension workers and key farmers at different farmer clubs on the new technologies
- Organizing farmer exchange and demonstrations between farmer clubs
- Inviting farmers from other villages to clubs or demonstration sites and train them by extensionists or key farmers

### **Evaluation of fodder and seed delivery/input supply mechanisms**

Previous efforts to introduce improved feeds into smallholder livestock systems have tended to focus on introducing the technologies themselves through demonstrations, technical training and so on. One reason for lack of adoption of technologies introduced through such approaches may have been lack of attention to sustainable mechanisms for maintaining uptake of new technologies. For example, planting material availability is often cited as a key constraint to the use of planted forages along with gaps in technical knowledge about forage establishment, management and utilization. FAP attempted to move beyond technology-focused approaches by considering weaknesses in delivery mechanisms for planted fodder and looking for ways of overcoming them. This played out in different ways in the three study countries as follows.

#### ***Ethiopia***

In Ethiopia, using local stakeholder platforms as the mechanism, forages were planted by an increasing number of households each year (400 households directly involved by project end with many other informal adopters). We were careful to ensure that expansion of forage introductions beyond year 1 were led by local stakeholders as part of the stakeholder platform action plan. Thus, the extension offices in each site took the lead in mobilizing farmers and monitoring their progress. Other members of the platform were brought in to deal with seed supply issues and to help with farmer training. Seed supply mechanisms were a specific focus of discussion in all 3 stakeholder platforms and seed multiplication activities were undertaken by local offices of agriculture in at least one site. Training on seed multiplication was delivered by FAP staff in Alamata in partnership with local stakeholders. Other actors also investigated fodder seed supply as a commercial enterprise. At national level, forage seed supply was the topic of a national Fodder Roundtable convened by the project in March 2009. The meeting highlighted

the current distortions in the fodder seed market in Ethiopia which present barriers for commercial entrants to the market. The meeting also highlighted the fact that fodder has a low adoption rate in Ethiopia, despite efforts, because national capacity was never strongly built and the real demand for fodder seed from farmers is still not well quantified. This means that market conditions are not sufficiently stable for those considering entry to the market (contrary to other crops with an established market demand). It was also clear from discussions that risks associated with the long seed-fodder-livestock commodity chain are significant for potential seed producers who cannot predict future demand. The lack of knowledge to specify and articulate demand for forage seeds, limited technical know-how about seed, poor information about seed quality, and lack of rigorous certification have all resulted in variable and/or low demand for seed. It was clear that there are many barriers to development of a vibrant forage seed sector in Ethiopia and these are continuing to be addressed by ILRI beyond FAP.

### *Syria*

Poor access to information, credit, markets, appropriate technologies; lack of enabling policies and institutions; and weak extension system, input delivery services and fodder innovation capacity were identified by stakeholders at the pilot sites as the key factors contributing to household feed scarcity. Different communication strategies were used to enhance joint-learning and knowledge exchange between and within pilot sites to address some of constraints. They included annual planning workshops, field days, cross-site visits and short-courses.

A series of on-farm demonstrations complemented with applied research were undertaken with the aim of strengthening the innovative capacity of actors in the fodder/livestock innovation systems at the pilot sites to: increase fodder and seed supply; identify alternative cereal and cereal-legume pastures for spring grazing; and to compare grains of food/feed legumes as protein supplements in rations for lamb fattening and milk production.

Field days for all stakeholders were organized on 14, 23 and 25 April 2009 at the Salameih, Tal-Amri and El-Bab respectively. Also, a special field day was organized for women at El-Bab on 30 April 2009 which was attended by women from Salameih and Barkum village. Representatives from all pilot sites participated in the field days at all sites to allow for knowledge exchange. The field days also allowed cross-site visits for joint learning.

Special field days were organized for only women at the El-Bab pilot learning site, and a short-course on milk processing was organized at Salamieh. The field day and training provided opportunity for cross-site visits and knowledge exchange among women. Women were also encouraged to participate in project activities.

### *Vietnam*

Seed delivery and input supplies included forage seeds, vegetative planting material, protein and energy supplements and credit. As the vast majority of forages adopted by farmers were grasses that could be propagated vegetatively this circumvented the difficult issue of how to ensure farmer's access to quality seed. Small quantities for forage seeds were initially provided



to farmers who were encouraged to expand their areas using vegetative planting material. Soon a lively market for planting material developed which supported the expansion of fodder production.

Using cultivated forages as the basal feed, farmers initially provided no other supplements for their animals. With time farmers started to use energy supplements towards the end of the fattening period to quickly reach the final weight and body condition. The main source was cassava meal and the project introduced cassava waste as low-cost alternative to reduce the cost for farmers. As farmers accessed higher-quality markets, they needed to produce younger, cross-bred cattle which required a higher protein diet than older animals. While fish meal and soy bean meal were available as a protein supplement they were also costly and so reduced the profit margin for farmers. The project evaluated and introduced low-cost alternatives which were adopted by many farmers. For example in Ea Kar substituting 1/3 of a fresh forage grass mixture with the forage legume *Stylosanthes guianensis* (Stylo) provided a similar amount of protein to cattle as using fishmeal based concentrates, but at the fraction of the cost. The corresponding growth rates were similar at between 22.9 and 23.9 kg/month, making Stylo a viable alternative to expensive concentrates for farmers.

In Ea Kar, the analysis of forage adoption in 2007 (see Figure 1, presented earlier) showed that indigenous and ethnic minority villages, who were among the poorest households in Ea Kar, had not adopted forages and relied on traditional grazing as a way of cattle raising. Following consultations with these villages, the project supported interested households to engage in cultivation of forages and cattle fattening. Following the introduction of forages in 2008, the project facilitated access to credit to enable these households to engage in regular cattle fattening (buying thin – selling fat). This was needed as these households had limited capital and were unable to obtain credit from banks. In consultations among stakeholders it was resolved to test a scheme where traders would obtain credit to purchase thin cattle and enter into a contract with indigenous households to fatten these cattle and then sell back to traders. Five households entered into contracts with traders and started to fatten cattle using planted forages plus 1 kg rice bran and rice straw. Average live weight gain was 700 g/day and farmers made a profit of USD 27 per month per fattened animal, which is similar to the profit of other cattle fattening farmers. At a cross-visit for other ethnic minority farmers this result stimulated the interest in cattle fattening of further households. Key factors for success were the employment of an indigenous extension worker to interact with farmers, and the development of linkages with traders and a local bank to provide credit to farmers through traders. This approach can benefit both traders and farmers: traders can get low interest loans and invest them in thin cattle with high revenues at city markets. Farmers are provided with healthy cattle and are paid for increases in body weight according to the market price. The economic gains encouraged ethnic minority people, who did not adopt forage technologies before to plant forages and provided a new and profitable livelihood option. Problems emerged in late 2010, when the local Social Bank was no longer allowed to provide credit through traders and was

only allowed to provide credit directly to the poor. To overcome this constraint the extension office decided to provide credit to farmers through a small project, starting in 2011.

**Output 3. Enhanced capacity of project partners to experiment with and use fodder innovations through effective communication, technical information and training in diverse aspects placing fodder interventions in the context of systems of innovation.**

**Development of appropriate communication strategies for joint learning within and between countries**

Co-learning at various scales was a key element of FAP. A central component of the innovation systems concept around which FAP revolved was the idea that a key limitation to innovation is the lack of information flow among key actors at different levels. This lack of knowledge flow can block innovation at local level. For example extension staff may not have the technical know-how to advise farmers on feed technologies. Furthermore farmers may not be aware of quality criteria for livestock products in distant markets. At higher levels key actors often work in isolation and mechanisms for information flow are limited. For example the structures of Government Ministries may mean that there is little lateral communication. Finally there may be a disconnect between what is happening at local level and what is happening at national level. FAP attempted to evaluate existing communication mechanisms and to experiment with ways of enhancing information flow at various scales and between scales.

***Ethiopia***

Various strategies were used to facilitate learning among key stakeholders in Ethiopia and these were designed to address local learning and also improved learning between local actors and national actors.

At local level, the main strategy developed for communication and joint learning was the establishment of local innovation platforms. These were loose networks of livestock actors at each learning site which met 3 or 4 times a year to address feed scarcity issues in each learning site. The format for these meetings was based around review and updating of rolling action plans and assignment of responsibilities to each platform actor. Actions were designed to be practical and to show short-term gains in order to sustain the momentum of the platforms. The platforms were excellent fora for joint learning among local stakeholders. Their effectiveness varied by site: in Ada'a woreda, the activities of the stakeholder platform initially supported introduction of improved fodder varieties. As time went on the activities supported by the platform broadened to include supporting the establishment of a small dairy cooperative, procurement of cross-bred cows and brokering of marketing arrangements for milk. Some of the lessons learned from the experience of facilitating innovation platforms are set out in a conference paper (Ergano et al. 2010).

As well as local level learning, the project experimented with ways of connecting local experience to national level actors. The main vehicle for this was the setting up of the Ethiopian Fodder Roundtable as a national feed forum which met (and continues to meet) twice per year to consider a range of feed issues. Topics for Roundtable meetings have tended to be based on

what was happening at our learning sites. Thus we had a meeting on forage seed supply issues (ref) and another on input supply (ref). The Fodder Roundtable has proved a popular forum for exchange of knowledge and for networking among the Ethiopian livestock community.

A further forum for learning in Ethiopia was the project's National Advisory Committee which was convened comprising members from Regional Research and Regional Ministry from the two target regions as well as Federal Research and Federal Ministry and the NGO sector. The Committee was chaired by the Head of Livestock for the Ethiopian Institute of Agricultural Research and provided guidance on development of forthcoming work plans.

### *Syria*

In Syria, a range of communication mechanisms were tried. These included annual planning workshops, short-term training events, field days, and cross-site visits. All were designed to promote joint learning and knowledge exchange.

Fodder innovation networks made up of producers, staff of ED, AWRA, ICARDA and AKRSP (in Salameih only) were set up at each pilot site. Members of the network met regularly through farm visits and annual planning workshops to discuss work-plans and exchange knowledge on issues related to forage/livestock production.

Field days for all stakeholders were organized at the pilot sites to demonstrate best practices. A special field day was organized for women at El-Bab which was attended by women from Salameih and Barkum village. The field days also allowed cross-site visits for joint learning and knowledge exchange.

Short-courses to 'train-the-trainer' were organized on forage and livestock production, forage seed production, integrated crop-livestock production, and socio-economic survey for staff of AWRA, ED and IFAD-funded investment projects in Syria. Staff of ED in turn trained farmers in best practices in forage/livestock production through farm visits. A short-course on milk processing was organized by women at Salameih which allowed cross-site visits and knowledge exchange between women from El-Bab and Salamieh.

### *Vietnam*

The main mechanisms for joint learning among learning sites in Vietnam were the annual review and planning workshops, which included field visits and brought together key stakeholders from both sites. The workshops were held in alternate years in the two study districts and included members of the Advisory Committee and representatives of related organisations and projects and provided an opportunity to share project outcomes with district, provincial and national level stakeholders. Cross visits among learning sites and the use of trainers from the more advanced site in Dak Lak to support and mentor staff in Ky Anh also fostered communication and exchange, and led to informal contacts among extension workers.

At learning site level, the local coalition for development provided an excellent forum for discussions and learning at local level. These were described earlier. At farm level, the formation of farmer clubs (formalised farmer interest groups) and implementation of Village Learning Activities (VLA) were the key to information exchange and learning. VLAs were held repeatedly and on mutual demand (farmers subsequently asked for VLA to address concrete problems). They were used to create a forum for discussion and exchange and to moderate and disseminate ideas. They helped to create or revive farmer groups, select key farmers for trials and demonstrations, ensure farmers were aware of the crucial components of the trials and would follow the protocols, evaluate the trial outcome, and, finally, to make joint decisions on the better or best approach and how to change the production system. Extension workers then made the connection between farmers from different villages in the district and organized cross-visits to more advanced farms and areas. At new sites, the organization was left more to the farmers and cross-visits did not need to be organized through extension workers but farmers could simply visit intervention sites and learn about the new method from their farmer colleagues.

In a different approach farmers were brought to visit livestock and meat markets and met other value chain stakeholders to discuss and better understand market demands and constraints of other market chain stakeholders. The idea was to provide a better understanding about product demand, risks and prices. The detailed process how this was done has been described in the section *Market Evaluation and Development*. The FEAST tool development workshop, held in Hyderabad 12-15 June 2009, provided an opportunity for knowledge sharing and joint planning with Alan Duncan and project partners from other countries. These personal interactions were extremely valuable in facilitating cross-country learning and supplement email and telephone contact among country teams.

### **Identification and participation in training modules for innovation systems (with DFID project)**

#### ***Ethiopia, Syria, Vietnam***

The Fodder Adoption Project was a long time in gestation and as ideas for the project evolved a new paradigm for rural development was emerging based on innovation systems thinking. This evolution from technology-led approaches to a more actor-oriented approach was also apparent in our sister project, the Fodder Innovation Project (FIP). In the case of FIP, lessons learned in the technology-focussed FIP Phase 1 (2003-2006) led to a radically different approach in FIP Phase 2 (2006-2010) which consisted of a large scale experiment on application of innovation system principles using fodder as a case study. The connections between FIP Phase 2 and FAP (2007-2011) were established at the inception of FAP and opportunities for joint learning were taken throughout the lifetime of the two projects as follows.

Early on we organized a project-wide workshop on “Understanding Fodder Innovation” involving participants from all three countries and led by FIP innovation scientist, Ranjitha Puskur. FAP co-ordinator Alan Duncan participated in DFID-FIP workshop on Monitoring and Learning for

Innovation Projects in Jan 2008. FAP organized an in-country workshop in Ethiopia on “Innovation Experience Sharing” bringing together stakeholders from all 4 learning sites as well as participants from the DFID Fodder Innovation Project. Alan Duncan attended the final meeting of the Fodder Innovation Project in May 2009 and contributed experiences from FAP. The FIP co-ordinator (Peter Bezkorwajnij and latterly Ranjitha Puskur) attended each of the FAP Co-ordination meetings over the project lifetime. We also commissioned a cross-project synthesis of lessons on application of innovation approaches.

The various interactions between FIP and FAP were certainly instrumental in shaping the thinking and approach of the FAP.

### **Identification of partner capacity building needs**

#### ***Ethiopia***

Partner capacity building needs were initially identified through discussion with IPMS Research Development Officers at the 4 study sites. It was clear that there was a pressing need for training of extension agents on cultivated fodder establishment, management and utilization and a training module was developed and implemented in all study sites at intervals through the project (see Table 2). The training module was jointly developed with the newly-established Ethiopian Meat and Dairy Technology Institute and where possible was delivered jointly with local stakeholders.

With establishment of local innovation platforms, training needs tended to emerge through stakeholder discussion and then became actions agreed by the platforms. For example, stakeholders in Alamata expressed the need for training in forage seed production and a course was subsequently delivered by forage agronomist, Abate Tedla. A further training need emerging from the platforms was general training on innovation concepts and this led to a round of short 1-day trainings at each site for interested stakeholders (see Table 2).

#### ***Syria***

Similarly in Syria a range of training events were organized at local and national levels. At the outset to assess capacity gaps, a workshop on ‘Capacity Building and Communication Material Needs Assessment’ was organized in November, 2008. A pronounced technical capacity gap on establishment, management and utilization of planted fodder and crop residues was identified among both farmers and extension personnel. To this end, a train-the-trainer strategy was used with extension staff, who in turn trained farmers. Short courses on forage and livestock production, forage seed production, integrated crop-livestock production, and socio-economic survey were organized for research and extension staff of the SMAAR, as well as staff of the IFAD-funded North-Eastern Regional Rural Development, Idleb Rural Development and Badia Rangeland Development Projects in Syria.

Graduate training and internships were an integral part of the capacity strengthening activities. Two graduate students used some project activities for their dissertation research. Mr. Habib Nabil completed and defended his PhD dissertation research at Tashreen University, Lattakia,

Syria in July 2009. Amin Al-Jundi defended his dissertation research at Cukorova University, Adana, Turkey in March 2010. Also, Mr Julian Greets was an intern with the project for 8 weeks between September-October 2010 working on market survey data.

### *Vietnam*

Capacity building needs varied greatly from site to site and were established early in the project cycle. Training events were based on the needs of participants and for project implementation. Timing was such that skills learnt in training courses could be practiced and used immediately in the field, and follow-up trainings reviewed experiences of trainees. Emphasis was placed on strengthening the capacity of local partners to become trainers themselves; this was seen as an essential component of ensuring continued development and sustainability of project outcomes. Another training approach was coaching and mentoring of new and weaker partners by more experienced partners.

Training for farmers included: forage establishment, management and utilization, cattle fattening and improved cow-calf production. Training courses for extension workers included (i) technical issues such as forage agronomy, animal nutrition and feeding systems; (ii) extension methodology such as participatory approaches to working with farmers, improved communication and group facilitation skills, and how to conduct Village Learning Activities (VLA) and (iii) market-related issues such as formal market assessment and participatory market studies. A list of training events is presented in Table 2.

### **Development of project communication material**

As the project progressed project staff increasingly engaged in production of project communication material to reach audiences at different levels with project findings and increasingly the materials were either co-developed or developed in response to needs of stakeholders rather than being decided and planned up front by the project. Such materials ranged from simple technical extension materials to videos, issue briefs, conference papers and blog postings.

### *Ethiopia*

In Ethiopia, project communication material took various forms and our strategy evolved as the project progressed. We engaged to a limited degree in production of technical extension products. For example, in response to demand from farmers and other stakeholders we revised and updated existing fact sheets from the ILRI seed unit on best-bet forages for Ethiopia and translated these into local languages and distributed to participating farmers and extension agents.

At national level, we used our twice yearly Fodder Roundtable meetings as the basis for producing issue briefs on a variety of topics and these were also distributed in print form and placed on the internet.

Later in the project we developed a very active project blog ([www.wordpress.fodderadoption.com](http://www.wordpress.fodderadoption.com)) which received increasing numbers of views as the project progressed (3600 views from establishment in Dec 2009 to time of writing in Aug 2011). We also developed a website for FEAST (<https://sites.google.com/a/cgxchange.org/feast/home>) and the current methodology is available for testing along with a series of reports that have already been produced for locations in Ethiopia, Kenya, India, Bangladesh and Nepal.

We also made use of video, both to document project activities in one site and also to evaluate project activities from a community perspective in another site. Communication materials are listed in [Section 7.c](#).

### *Syria*

Seven extension leaflets on barley, alfalfa, maize, and vetch, and hay-making, urea treatment of straw and feed block were developed. One thousand copies of each leaflet were printed and distributed to farmers. A range of publications, including a Technical Advisory Note (TAN) and journal publications are in progress.

### *Vietnam*

Two types of communication material were developed: material for extension and teaching, and material for project promotion and sharing of lessons learned to the national and international development and agricultural research community. The material produced included guide books in English and Vietnamese, leaflets, posters and videos in Vietnamese only, for extension, and a special issue with ten journal articles and three technical advisory notes, which are still in progress for a broader audience. The distribution of the material was done through the national extension offices. More detailed information on the material published is listed below.

## **Output 4. Generic lessons with wide applicability on innovation processes and systems, communication strategies and partnerships that provide an enabling environment to enhance scaling up and out of fodder innovations.**

### **Principles for site identification and comparison (innovation systems framework)**

Site selection decisions followed different trajectories in different countries providing some useful insights into how such decisions can be made and what some of the repercussions are for such decisions and the project activities unfold. As discussed at the final project workshop, site selection decisions represent a trade-off between sticking with the familiar (known partners and problems, track record of involvement by the organization, ease of access etc) versus choosing new and more difficult sites. Choosing familiar sites may increase likelihood of project success in terms of on-the-ground uptake of technologies and practices but the lessons to be gleaned from those sites may be less useful than those emerging from more challenging sites (new partners, new agro-ecology, access challenges). These issues are discussed in a blog posting entitled "[Selecting an innovation systems research site](#)"

## *Ethiopia*

In Ethiopia site selection was somewhat constrained by our alliance with the Improving Productivity and Market Success project. IPMS sites were selected by the regional offices of the Ministry of Agricultural and Rural Development. IPMS stimulated formation of one so-called Regional Advisory and Learning Committee (RALC) per region at the inception of the project. The RALC was composed of representatives from Regional Research institutions, the Bureau of Agricultural and Rural Development and Finance organizations. The IPMS team specified the number of sites that should be selected per region and then a short list of 5 sites per region was drawn up by the RALC. A meeting of representatives of all four Regional Governments was then convened for final site selection. An element of the final decision was avoidance of too much duplication of commodity focus. Criteria for site selection were multiple but two key factors were market-oriented potential (at least one potential good marketable commodity) and reasonable infrastructure/accessibility. Convening the RALC and devolving responsibility of site selection encouraged support and ownership from the Regions. There was some political pressure to include food insecure sites and this was reflected in the final site selection. Relaxation of the market-orientation selection criterion has led to a number of food insecure sites being selected and the culture of food security measures rather went against the IPMS project ethos which was about enterprise development. Selection of FAP sites from the long list of IPMS sites was done on the basis of discussion with senior IPMS staff and field visits to 4 potential sites. Essentially, the sites selected as FAP sites were those that had the strongest potential for development of livestock commodities. This yielded two food insecure sites (Alamata and Mieso) and two more market oriented sites (Ada'a and Atsbi). The way project activities played out subsequently was greatly influenced by the degree of market orientation of the sites. The site with the greatest momentum was Ada'a, which reflected the proximity to urban centres and the diversity of actors present at local level.

## *Syria*

National, provincial and community level consultations and start-up workshops were held with farmers' groups, research and development partners, and decision makers (policy makers, investors, directors) from public and private agencies related to fodder/livestock to identify project sites and partners. El-Bab, Salameih and Tal-Amri in Homs, Hama and Aleppo provinces respectively were identified as pilot learning site using provincial spread, sheep population, availability of effective research and development partners, and market access as selection criteria. Innovation networks made up of producers, staff of Extension Division (ED), Animal Wealth Research Administration (AWRA), ICARDA and Aga Khan Rural Support Program (AKRSP, in Salameih only) were promoted at each pilot site to address the feed scarcity issue. A Project Site Advisory Committee (SAC) made up of representatives of farmers' groups, district extension and research divisions, and ICARDA was established. The SAC was responsible for developing site work-plans and budgets, implementing and monitoring activities, identifying training needs, organizing field days, and on-farm data collection. The involvement of AKRSP at the Salameih pilot site allowed the project to reach out to more households than the other sites. It also



allowed joint activities such as training on milk processing for women to be organized. AKRSP also facilitated establishment of demonstration plots and arrangements for field days.

The Syrian component of the project supported a meta-analysis of innovation system approaches across FAP project sites by Dr. Seife Ayele who visited Syria from 29 May to 3 June, 2010.

### ***Vietnam***

In Vietnam, the project was implemented at two sites, one in the southern central part of Vietnam, Ea Kar district, Daklak province and one in the northern central part, Ky Anh district, Ha Tinh Province. Ea Kar site was selected as a more advanced site where forages had already been introduced by an earlier CIAT Project, the Southeast Asia regional 'Livelihood and Livestock Systems Project (LLSP)' and so provided an opportunity for developing market-oriented cattle production while the second site was a new site without prior forage and cattle development embedded within an IFAD loan project. The more advanced Ea Kar site already had several local partners who were experienced in forage agronomy and could be mobilised as trainers for partners at new sites. Also, some farmers in Ea Kar had already moved towards intensification of their livestock production which provided an excellent basis for further development. Ky Anh, the second site selected during the first year of the FAP, was a poor district which the IFAD loan project 'Improving Market Participation of the Poor (IMPP)' had identified as a target district with potential for cattle development. The Vietnam project team was keen to select a learning site within an existing IFAD Loan Project with potential for upscaling project outcomes within the IFAD loan project. Following discussions with the IFAD country office for Vietnam, the project team visited three IFAD loan projects in Vietnam that had a livestock component. These were located in Ha Tinh, Ha Giang and Quang Binh. Following extensive consultations during the field visit, the IMPP was selected as the main partner development project based on perceived potential for cattle development, interest by farmers and the perceived support and interest by the IFAD team and local government. Once selected, IMPP played a major role in facilitating the start-up and implementation of project activities in Ky Anh.

A site description matrix for all project study sites has been developed to allow comparison of biophysical, farming system and market environment conditions across the study sites in the 3 study countries. Furthermore a meta-analysis of research approaches across the 3 FAP and 2 FIP study countries has been initiated as mentioned in Output 3

### **Identification and streamlining of project tools/methodologies**

#### ***Ethiopia, Syria and Vietnam***

Identification of common tools for use across the project was a major emphasis of the First Co-ordination meeting at Aleppo, Syria in Dec 2008. At that meeting three key areas for convergence of approaches across the project countries were identified. These were:

Feed assessment

Market appraisal

Innovation system tools

Various steps were subsequently taken to bring together the activities of the three countries in these three areas. For the market appraisal theme, a training involving participants from all project countries was organized in Addis Ababa in 2008. This was led by a consultant from CIAT in Vietnam, Tiago Wandschneider and was used as the springboard for fodder rapid market appraisals at the Ethiopian sites. Rapid market appraisal methodology was already being used in the Vietnam sites.

For Feed Assessment, we convened a cross-country workshop in Hyderabad, India in 2009. This brought together experts from Vietnam, India and Ethiopia to develop a rapid feed assessment tool. Out of this meeting we developed a prototype feed assessment tool (FEAST) which was subsequently refined and tested in Ethiopia, Kenya, India, Bangladesh and Nepal. We have yet to test the tool fully in Syria although the Syrian team did develop a template for characterizing feeding practices and seasonal feed deficits.

For Innovation System tools and methods, again, we convened a cross-country training workshop in April 2008 in Ethiopia which brought together participants from all three project countries. The training was led by Ranjitha Puskur of the Fodder Innovation Project and was influential in setting the innovation agenda for the project. The Workshop led to application of similar tools across all countries for assessment of innovation capacity. More importantly, it helped to develop the conceptual thinking of the project participants in innovation systems perspectives and this had a strong influence on subsequent activities.

## **Evaluation of policy and institutional environment**

### ***Ethiopia***

In Ethiopia we addressed evaluation of the policy and institutional environment in various ways. Firstly we engaged a student intern to undertake a desk review of livestock policy in Ethiopia and how it influences livestock-related innovation at local level. The study of Messaye Dessie summarized the disconnect between national projects and policy and local grass-roots livestock development. The report highlighted the ongoing emphasis of research and extension systems on technology packages, mainly aimed at enhancing cereal production. It also revealed the under-emphasis on livestock related research and extension showing that livestock were largely viewed as providing inputs into cereal production rather than as an income generating enterprise in their own right. The study revealed the lack of attention to creating an enabling environment for the private sector to flourish and take on roles hitherto within the mandate of

public bodies (e.g. input supply). Finally the study pointed to the technology focus of much of the national research system with very little in the way of systems research and social science research within public sector research.

The institutional environment was the subject of a site level diagnosis of innovation capacity and the findings are presented under Output 1 activity 2: “Evaluation of actors, linkages, practices and habits related to fodder innovations”

### *Syria*

Interviews with farmers, traders, decision makers at the pilot site revealed that provincial, district and/or local governments have limited control over policies and institutions that influence fodder/livestock production at the project sites. The strategy adopted was to support decision makers in public and private agencies related to fodder and livestock production through knowledge sharing and joint learning. To this end, a national workshop on *‘Policies and institutions to enhance fodder and feed availability in Syria’* was organized in collaboration with the Syrian National Agricultural Policy Research Centre in November 2007. The objective was to review existing policies and institutions related to the fodder/livestock sector, and make recommendations for improvement. The workshop was attended by the Deputy Minister of Agriculture and Agrarian Reform and decision makers from both public and private sectors.

Farmers, traders, feed processors and other stakeholders at the learning sites were interviewed to document their opinions and suggestions on policies and institutional arrangements to improve fodder/livestock production at the learning sites. Among the recommendations were: removal of restrictions on feed/fodder imports and exports, measures to enable small-scale livestock producers to access subsidized loans and feed, including more fodder crops in the list of strategic crops, development of water resources, provision of improved rams, and reviewing the crop allocation plan.

### *Vietnam*

The project supported the meta-analysis of innovation system approaches across project sites of both FIP and FAP projects by Seife Ayele. He visited the Daklak site for 10 days in 2009 to interview key stakeholders with the assistance of the Daklak project team.

Strong support and interest by the local governments Ea Kar and Ky Anh was identified as an important factor in creating an enabling environment for forage and livestock development through regulations and promotion of livestock development. Examples include restrictions of free grazing in forage growing areas and simplification of trade regulations. Local policies and regulation relating to cattle development have been collated in Ea Kar and were compared to

those in Ky Anh to identify constraints and develop recommendation. District governments at both project sites have been very interested in promoting cattle development and created a favourable environment for these activities.

## **7. Products**

## a. People trained

**Table 2 - List of training events arranged by FAP over the project lifetime in Ethiopia, Syria and Vietnam**

| <b>Title of Training</b>  | <b>Country location of training</b> | <b>Date</b>         | <b>Target Group</b>  | <b>Number of trainees</b> | <b>Training Materials</b>  | <b>Responsible Lead Trainers</b>        |
|---|-------------------------------------|---------------------|--|---------------------------|--|---|
| Understanding Fodder Innovations                                | <b>Cross-country</b>                | <b>15-18/4/08</b>   | <b>Researchers and development workers</b>                             | <b>23</b>                 | <b>Manual</b>  | <b>Ranjitha Puskur</b>                  |
| Training on Rapid Market Appraisal (RMA) for Fodder Products    | <b>Cross-country</b>                | <b>4-8/11/2008</b>  | <b>Researchers and development workers</b>                             | <b>13</b>                 | <b>Hound outs and sample checklists, CD</b>                            | <b>Tiago Wandschneider</b>              |
| Fodder establishment, management, utilization and conservation  | <b>Ethiopia</b>                     | <b>6/6/2008</b>     | <b>Farmers and deveopment agents in Ada'a</b>                          | <b>54</b>                 | <b>Forage fact sheets</b>  | <b>Abate Tedla and project partners</b> |
| Fodder establishment, management, utilization and conservation  | <b>Ethiopia</b>                     | <b>17/6/2008</b>    | <b>Development agents in Mieso</b>                                     | <b>10</b>                 | <b>Forage fact sheets and hand outs</b>                                | <b>Abate Tedla and project partners</b> |
| Fodder establishment, management, utilization and conservation  | <b>Ethiopia</b>                     | <b>15/7/2008</b>    | <b>Farmers and development agents in Alamata</b>                       | <b>25</b>                 | <b>Forage fact sheets and hand outs</b>                                | <b>Abate Tedla and project partners</b> |
| Fodder establishment, management, utilization and conservation  | <b>Ethiopia</b>                     | <b>22/7/2008</b>    | <b>Development workers in Atsbi</b>                                    | <b>35</b>                 | <b>Forage fact sheets and hand outs, CD</b>                            | <b>Abate Tedla and project partners</b> |
| Fodder establishment, management, utilization and conservation  | <b>Ethiopia</b>                     | <b>11-12/4/2009</b> | <b>Farmers and development agents in Mieso</b>                         | <b>50</b>                 | <b>Forage fact sheets and hand outs</b>                                | <b>Abate Tedla and project partners</b> |
| Training on Seasonal Feed Market Data Collection and Processing | <b>Ethiopia</b>                     | <b>21/05/2009</b>   | <b>Seasonal feed data collectors from Mieso, Chanco and Debre Zeit</b> | <b>5</b>                  | <b>Field Market Data Collection Protocol and data collection sheet</b> | <b>Kebebe Ergano and Alan Duncan</b>    |
| Fodder establishment, management, utilization and conservation  | <b>Ethiopia</b>                     | <b>26/06/2009</b>   | <b>Farmers and development agents in Alamata</b>                       | <b>25</b>                 | <b>Forage fact sheets and hand outs</b>                                | <b>Abate Tedla and project partners</b> |

| <b>Title of Training</b>   | <b>Country location of training</b> | <b>Date</b>         | <b>Target Group</b>   | <b>Number of trainees</b> | <b>Training Materials</b>                                  | <b>Responsible Lead Trainers</b>        |
|--|-------------------------------------|---------------------|---|---------------------------|--|---|
| Fodder establishment, management, utilization and conservation   | <b>Ethiopia</b>                     | <b>15-16/9/2009</b> | <b>Development workers in Ada'a</b>                             | <b>15</b>                 | <b>Forage fact sheets and hand outs</b>                    | <b>Abate Tedla and project partners</b> |
| Refresher training on seasonal feed market data collection protocol  | <b>Ethiopia</b>                     | <b>21/01/2010</b>   | <b>Data collectors from Mieso, Chanco and Debre Zeit</b>        | <b>4</b>                  | <b>Revised data collection sheet</b>                       | <b>Kebebe Ergano</b>                    |
| Forage seed production training  | <b>Ethiopia</b>                     | <b>23-25/3/2010</b> | <b>Development workers,experts and stakeholders in Alalmata</b> | <b>15</b>                 | <b>all relevant documents/power point presentations/CD</b> | <b>Abate Tedla and project partners</b> |
| Forage seed production training  | <b>Ethiopia</b>                     | <b>3-5/5/2010</b>   | <b>Development workers,experts and stakeholders in Mieso</b>    | <b>15</b>                 | <b>all relevant documents/power point presentations/CD</b> | <b>Abate Tedla and project partners</b> |
| Fodder establishment, management, utilization and conservation   | <b>Ethiopia</b>                     | <b>15-16/6/2010</b> | <b>Farmers,DAs and experts in Mieso</b>                         | <b>70</b>                 | <b>Forage facts sheets</b>                                 | <b>Abate Tedla and Aberra Adie</b>      |
| Fodder establishment, management, utilization and conservation   | <b>Ethiopia</b>                     | <b>23-25/6/2010</b> | <b>Farmers, DAs and experts in Ada'a</b>                        | <b>130</b>                | <b>Forage fact sheets</b>                                  | <b>Abate Tedla and Aberra Adie</b>      |
| Fodder establishment, management, utilization and conservation   | <b>Ethiopia</b>                     | <b>07/08/2010</b>   | <b>Farmers, DAs, experts in Alamata</b>                         | <b>25</b>                 | <b>Forage fact sheets</b>                                  | <b>Abate Tedla and Aberra Adie</b>      |
| Need for Transition of Agricultural Extension from Technology Dissemination to Innovation Process Facilitation | <b>Ethiopia</b>                     | <b>21/10/2010</b>   | <b>Agricultural experts, DAs and farmers at Mieso</b>           | <b>48</b>                 | <b>power point presentations</b>                           | <b>Kebebe Ergano</b>                    |
| Crop-livestock production  | <b>Syria</b>                        | <b>13-30/4/08</b>   | <b>Extension/researchers</b>                                    | <b>3</b>                  | <b>Handouts</b>  | <b>A. Larbi</b>                         |
| Forage seed production   | <b>Syria</b>                        | <b>18-29/5/08</b>   | <b>Extension/researchers</b>                                    | <b>3</b>                  | <b>Handouts</b>  | <b>A. Aziz</b>                          |
| Socio-economic survey  | <b>Syria</b>                        | <b>20-21/7/08</b>   | <b>Extension staff</b>  | <b>17</b>                 | <b>Handouts</b>  | <b>M. Darwish</b>                       |
| Forage/livestock production  | <b>Syria</b>                        | <b>22-25/7/08</b>   | <b>Extension/researchers</b>                                    | <b>18</b>                 | <b>Handouts</b>  | <b>Y. Masri</b>                         |
| Milk handling/processing   | <b>Syria</b>                        | <b>2-3/4/09</b>     | <b>Housewives</b>   | <b>25</b>                 | <b>Handouts</b>  | <b>M. Obaido</b>                        |

| <b>Title of Training</b>   | <b>Country location of training</b> | <b>Date</b>  | <b>Target Group</b>                                      | <b>Number of trainees</b> | <b>Training Materials</b>                                       | <b>Responsible Lead Trainers</b>                     |
|--|-------------------------------------|--------------|--|---------------------------|---|--|
| Forage/livestock production  | Syria                               | 10-13/5/09   | Extension/researchers                                    | 22                        | Handouts  | Y. Masri   |
| Exchange visits-Salameih   | Syria                               | 13-14/4/09   | Farmers/extensionists                                    | 350                       | Demonstrations  | M. Obaido  |
| Exchange visits: Tal-Amri  | Syria                               | 23/04/2009   | Farmers/extensionists                                    | 120                       | Demonstrations  | W. Samir   |
| Exchange visits: El-Bab  | Syria                               | 25/04/2009   | Farmers/extensionists                                    | 200                       | Demonstrations  | R. Hamadi  |
| Women's travel workshop  | Syria                               | 30/04/2009   | Women, housewives  | 55                        | Demonstrations  | S. Hassan  |
| Lessons workshop: Hama   | Syria                               | 25/01/2011   | Extension  | 100                       | Discussion  | M. Abdallah  |
| Lessons workshop: Salameih   | Syria                               | 8-9/2/11     | Farmers, extensionists                                   | 140                       | Discussion  | M. Abdallah  |
| Lessons workshop: Tal-Amri   | Syria                               | 14/02/2011   | Farmers, extensionists                                   | 70                        | Discussion  | M. Abdallah  |
| Lessons workshop-El-Bab  | Syria                               | 16/02/2011   | Farmers, extensionists                                   | 70                        | Discussion  | M. Abdallah  |
| Lessons workshop-Homs  | Syria                               | 02/03/2011   | Policy makers  | 50                        | Discussion  | M. Abdallah  |
| Internship: J. Greets  | Syria                               | 1/9-27/10/10 | Students   | 1                         | Field research  | A. Larbi   |
| Ph.D. research: N. Habib   | Syria                               | 2007-2010    | Researchers  | 1                         | Field research  | A. Larbi   |
| M.Sc. research: A. Al-Jundi  | Syria                               | 2008-2010    | Researchers  | 1                         | Field research  | A. Larbi   |
| Working with farmers to develop forage technologies. Focus on: Participatory research (PR)and Forage technologies. (2 courses)                 | Vietnam                             | 2008         | District and communes Extension from Đắk Lắk and Ha Tinh | 45                        | Writing material  | Dr. Truong Tan Khanh, TNU; Dr. Nguyen Ngoc Anh, NIAS |
| How to plant forages. (2 courses)  | Vietnam                             | 2008         | Local staff, farmers                                     | 56                        | Writing material, documentation, forage material (seeds, stems) | Dr. Nguyen Thi Mui, Dr. Nguyen Ngoc Anh, NIAS        |
| Cattle reproduction and feeding technologies in cow calf system. Focus on: Reproduction cycle, nutrition requirements and feeding technologies | Vietnam                             | 2008         | District and Commune extension in Đắk Lắk                | 30                        | Writing material  | Dr. Truong Tan Khanh, Van Tien Dung, TNU             |

| <b>Title of Training</b>  | <b>Country location of training</b> | <b>Date</b> | <b>Target Group</b>  | <b>Number of trainees</b> | <b>Training Materials</b>                                       | <b>Responsible Lead Trainers</b>   |
|---|-------------------------------------|-------------|--|---------------------------|---|--|
| Fattening cattle process and feeding systems (2 courses)                            | Vietnam                             | 2009        | District and commune extension   | 20                        | Writing material  | Dr. Truong Tan Khanh, TNU in Đắk Lắk; Dr. Nguyen Ngoc Anh, NIAS in Ha Tinh |
| Fattening cattle process and feeding systems (2 courses)                            | Vietnam                             | 2009        | Farmers club in Đắk Lắk  | 120                       | Writing material  | Dr. Truong Tan Khanh, TNU in Đắk Lắk; Dr. Nguyen Ngoc Anh, NIAS in Ha Tinh |
| How to plant forages (2 courses)  | Vietnam                             | 2009        | Local staff, farmers of four communes  | 60                        | Writing material, documentation, forage material (seeds, stems) | Dr. Nguyen Ngoc Anh, NIAS  |
| Village learning activities   | Vietnam                             | 2009        | Farmer club leaders, Extension at district and commune level                   | 30                        | Writing material  | Dr. Truong Tan Khanh, TNU;   |
| GIS use   | Vietnam                             | 2009        | Extension staff, project managers and local authority from Đắk Lắk and Ha Tinh | 35                        | Writing material, GIS short manual                              | Nguyen Van Duong, NIAS   |
| Market oriented production  | Vietnam                             | 2010        | Extension and head of farmer clubs   | 30                        | Writing material  | Dr. Truong Tan Khanh, TNU  |
| How to fatten cattle and cow calf feeding (2 courses)                               | Vietnam                             | 2010        | Local staff, farmers of four communes  | 65                        | Writing material, documentation                                 | Dr. Nguyen Ngoc Anh, NIAS  |
| Forage management (4 courses)   | Vietnam                             | 2010        | Local staff, farmers of 9 communes   | 90                        | Writing material, documentation, forage material (seeds, stems) | Dr. Nguyen Thi Mui, Dr. Nguyen Ngoc Anh, NIAS                              |
| Program training course to link TAG-853 to IMPP activities (one seminar, 5 courses) | Vietnam                             | 2010        | Extension workers, farmers of 6 communes in 2 new districts (link with IMPP)   | 168                       | Writing material, documentation, forage material (seeds, stems) | Dr. Nguyen Ngoc Anh, NIAS together with IMPP staff                         |



## **b. Reports and publications**

### **Publications in news media and magazine**

Bulbula, B. 2010. Accentuating livestock production to augmenting rural livelihoods. The Ethiopian Herald, Wednesday April 28, page 5.

*'Implementation of many trials in Homs with the support of ICARDA and Aga Khan Foundation'*, a report in *Homs Times* 21 February, 2007 on project scaling-out activities at the Salameih and Tal-Amri pilot sites.

*'Shortage of feed in Syria – policies and institutions'*. A report in *Al Thowra News Paper*, 9 November 2007 on a workshop on *'Policy and institutions affecting forage and livestock production in Syria'* jointly organized by the project and the National Agricultural Policy Center in Damascus, 8 November 2007.

Al Orouba News Paper (2009). Reported provincial at Homs and Hama workshop in El-Karim Sheep Research Center to enhance use of fodder. 18 May, 2009.

Abdullah, J. M. 2008. Enhancing farmer use of fodder to increase livestock production in Syria. The Agriculture Magazine, Issue 25.

Ola Abou Ajeeb, 2010. Hand-in-hand to enhance the livelihood of small livestock keepers in Syria. The Agriculture Magazine, 36:5-9.

Kassim El-Sharif (2010). Promising results of enhancing livelihoods of small livestock keeper's project. Al Ba'ath Newspaper, Volume 14090. 15 November, 2010.

Syrian Arabic News Agency (SANA), 2010. Workshop about enhancing livelihoods of small livestock keepers in Homs. 2 June, 2010.

### **Journal publications**

Rakeih N, Kayyal H, Larbi A, Habib N (2010) Forage yield and competition indices of triticale and barley mixed intercropping with common vetch and grasspea in the Mediterranean region. *Jordan Journal of Agricultural Sciences*, 6:194-206.

Special Issue with 10 publications in the Journal of Animal Science and Technology (The National Institute of Animal Sciences), 2011 (in press):

- Truong Tan Khanh & Văn Tiến Dũng . Reproductive productivity of Cows in different production methods in EA KAR district, Dak Lak province.
- Trương Tấn Khanh, Nguyễn Ngọc Anh. The adoption of planting forage at cattle production households in Ea Kar district, Dak Lak.
- Trương Tấn Khanh, Nguyễn Ngọc Anh, The role of stakeholders in developing forage production and beef cattle production in Ea Kar district, Dak Lak province.
- Trương Tấn Khanh , Trần Thị Ngọc. Studying on using byproduct from cassava processing in diet for fattening thin cattle.
- Trương Tấn Khanh. Study and development of using legume forage as animal feed in Dak Lak.
- Trương Tấn Khanh, Trần Thị Đàm. Assess effectiveness of protein sources on fattening beef production of two breeds Lai sind and F1(LS x Br) in Ea Kar, Dak Lak.
- Nguyen Ngoc Anh. Evaluation of biomass productivity of 5 grass species and the exemplary use of one of them, Paspalum atratum, to improve cattle growth and income generation for smallholders in Ky Tien và Ky Trung, Ky Anh district, Hatinh province.
- Nguyen Ngoc Anh. Assess a situation of cattle and buffalo production in two communes Ky Dong and Ky Bac, Ky Anh district, Ha Tinh.
- Nguyen Ngoc Anh. Assessing agricultural system in two communes Ky Tien and Ky Trung, Ky Anh district, Ha Tinh province.
- Truong Tan Khanh, Nguyen Ngoc Anh. Assessment of cattle marketing in Ea Kar district, Daklak, Vietnam in 2008
- Journal papers in preparation
- Larbi, A et al. Identifying winter triticale lines for grain production in Mediterranean environments (Field Crops Research).
- Larbi, A et al. Identifying winter triticale lines for grazing and grain production in Mediterranean environments (Field Crops Research ).
- Larbi A et al. Hay yield and quality variations among winter triticale lines in Mediterranean environments (Animal Feed Science and Technology).
- Larbi A et al. On-farm comparison of forage legume grains as protein sources in lamb fattening rations (Small Ruminant Research)
- Larbi A et al. On-farm comparison of broken food legume grains as protein sources in lamb fattening rations (Small Ruminant Research).

Larbi A et al. On-farm testing of triticale as alternative to barley for winter grazing. Small Ruminant Research (in preparation)

## Reports

Adie A, Tedla A, Duncan AJ & Ergano K (2010) *Participatory evaluation of fodder species planted in 2009 in Ada'a, Miesso and Alamata woredas in Ethiopia.*

Cullen, B. 2010. Conducting a participatory video project with farmers involved in the Fodder Adoption project activities in Mieso Woreda, Ethiopia: Report on a short consultancy. Nairobi (Kenya): ILRI.

Julian Geerts. 2010. Variations in market prices of cereal and legume grain and straw in north-west Syria. Internship report. 34 pp.

## Dissertations

Habib Nabil. 2010. Identification of winter triticale accessions for forage and grain production in marginal environments. PhD. Dissertation, Tishreen University, Latakia, Syria. 283 pp. ICARDA, Aleppo, Syria.

Amin al-Jundi, 2010. Performance of sheep grazing winter cereal and cereal-legume pastures. MSc. Dissertation, Cukurova University, Adana, Turkey, 43 pp. ICARDA, Aleppo, Syria.

## c. Presentations in conferences

Duncan AJ, Ergano K, Hailesellasie A, Muleta M, Hagos T, Yohalashet T & Assefa T (2010) Fodder marketing in Ethiopia: a synthesis of case studies in Oromiya and Tigray Regions. In *Proceedings of the 5th All Africa Conference on Animal Agriculture, Addis Ababa, Ethiopia. Oct 25-28 2010.*

Ergano K, Duncan AJ, Adie A, Tedla A, Woldewahid G, Ayele Z, Berhanu G & Alemayu N (2010) Multi-stakeholder platforms strengthening selection and use of fodder options in Ethiopia: Lessons and challenges. In *Innovation and Sustainable Development in Agriculture and Food. Montpellier, France 28 June - 1 July 2010.*

- Duncan AJ (2009) Strengthening stakeholder linkages to help farmers to cope with changing situations. *Middle East Regional Agriculture Programme Regional Workshop on Effect of Feed Crisis on Livestock Sector and How to Cope With the Situation 17th t - 18th August, 2009 in Amman/Jordan.*
- Duncan AJ, Puskur R & Stur WW (2009) Enhancing adoption of fodder technologies: how can an innovation systems perspective help? In *Animal Nutrition. Preparedness to Combat Challenges. Proceedings of Animal Nutrition Association World Conference Feb 14-17 2009. New Delhi, India*, pp. 41-44 [AK Pattanaik, AK Verma, DN Kamra, and K Sharma, editors]. New Delhi: Animal Nutrition Association, India.
- Larbi A, Hassan S, Ghufran K (2009) Feed legumes for dry land agriculture: Hay yield, quality and farmer preferences. *Joint Annual Meeting of Soil Science Society of America, American Society of Agronomy, and Crop Science Society of America, Pittsburgh, Philadelphia,, 1-5, November 2009.*
- Larbi A, Hassan S, El-Omar K, Rihawi S, Jammal B, Hammadi R, Al-Hammadi H, Al-Saleh R A, Al-Eliwe M H, Abdullah M (2010) On-farm comparison of cereal and cereal-legume pastures for spring grazing in north west Syria. Paper presented by S. Rihawi at *The 50th Science Week International Conference on 'Agricultural productivity increases: Challenges and means of development' Ministry of Agriculture and Agrarian Reform, Al-Furat University, /der-Azzor 28-30 November, 2010, pp. 85-86.*
- T. T. Khanh and N. V. Ha, 2007. Successful forage development for smallholders in Daklak, Central Highlands, Vietnam: The contribution of forages to livestock development and livelihoods of upland farmers. Forages: A Pathway to Prosperity for Smallholder Farmers. Proceedings of an International Forage Symposium, Faculty of Agriculture, Ubon Ratchathani University, Thailand. Pp 270
- T. T. Khanh, W. W. Stür and N. V. Ha, 2008. Planted forages – enabling improved smallholder cattle production in Ea Kar, Dak Lak, Vietnam. In: The 13th Animal Science Congress of the Asian-Australasian Association of Animal Production Societies, September 22-26 in Hanoi, Vietnam. Pp. 298
- W. W. Stür, J. Connell, P. Phengsavanh, T.T. Khanh, 2008. Unlocking the potential of smallholder livestock production – using managed forages as an entry point. In: Multifunctional grasslands in a changing world, Volume II: XXI International Grassland Congress and VIII International Rangeland Congress, Hohhot, China, 29 June-5 July, pp. 999.
- T. T. Khanh, W. Stür, N. V. Ha and Alan Duncan, 2009. Developing innovation capacity through effective research and development partnerships: A case study of moving from subsistence cattle raising to market-oriented beef production in Ea Kar, Daklak, Vietnam. Innovation Asia–Pacific Symposium, May 4–7, 2009, Kathmandu, Nepal. Web: [http://www. Innovation Asia-Pacific Symposium.net](http://www.InnovationAsia-PacificSymposium.net)

N. N. Anh, N. T. Mui, T. T. Khanh, V. T. Thin, H. D. Hieu, B. V. Phong, T. T. Lan, W. Stur, and T. Tiemann. 2010. Evaluation of Biomass Productivity of 5 Grass Species and the Exemplary Use of One of Them, *Paspalum Atratum*, to Improve Cattle Growth and Income Generation for Smallholders in Ky Anh, Ha Tinh Province, Vietnam. The 14th Animal Science Congress of the Asian-Australasian Association of Animal Production Societies, Pingtung, Taiwan. pp 735.

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ILRI. 2010. Oats (*Avena sativa*) for livestock feed on small-scale farms (English Version). Nairobi (Kenya): ILRI.

ILRI. 2010. Napier or elephant grass ILRI 14984 (*Pennisetum purpureum*) for livestock feed on small-scale farms (English Version). Nairobi (Kenya): ILRI.

ILRI. 2010. Pigeon pea (*Cajanus cajan*) for livestock feed on small-scale farms (English Version). Nairobi (Kenya): ILRI.

ILRI. 2010. Rhodes grass (*Chloris gayana*) for livestock feed on small-scale farms (English Version). Nairobi (Kenya): ILRI.

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## 8. Outcomes and lessons

### Innovation

#### *Ethiopia*

In Ethiopia, the project embraced an innovation approach early on while maintaining an ongoing focus on technical interventions. Fodder introductions were used as an entry point to catalyze stakeholder action rather than as an end in themselves. This dual emphasis on stakeholder engagement and practical technical interventions led to outcomes on the ground at two levels. Firstly, we saw changes in farming practice notably a steady increase in the numbers of farmers planting fodder species in our study sites. The scale of adoption was relatively modest: hundreds rather than thousands of farmers adopted. A second outcome however, was noted in changes in the behaviour of stakeholders which we anticipate will lead to more sustainable change in farming practice beyond the project life. Through the interactions which took place through local stakeholder platforms we saw a broadening of approach by the local offices of agriculture, especially in Ada'a. They are now facilitating the local stakeholder platforms without our input and are dealing with issues beyond simple feed supply, including negotiating market channels for milk, addressing failings in the AI system and so on. We also saw research actors becoming more habitually engaged with a wide range of stakeholders rather than working in isolation. We noted engagement in stakeholder platforms by private sector actors such as seed suppliers and feed companies. In general we observed much greater connectedness among local actors which stimulated a more collaborative and thus fruitful approach.

Farmers certainly benefited from project activities although perhaps to a lesser extent than if we had adopted a more conventional focus on feed technologies. We anticipate, however, that the long term benefits of our activities will result in much greater impact through sustained changes in the knowledge, attitudes and skills of a range of local actors. Conventional technology led approaches can show good short term impacts but these often disappear as the project phases out. It is too early to say whether our innovation approach will lead to more long-term and sustainable change – a further impact study some years down the line will be needed to assess this.

#### **We identified a number of lessons from our experience:**

**The need to carefully balance action with facilitation.** One key tension in project implementation was striking an appropriate balance between acting as a facilitator of the stakeholder platform and also acting as a member of the platform. Observers levelled different criticisms of project activities: one criticism could be summarized as “you are always organizing



meetings and you never do anything on the ground". This group were keen for action and less keen on talking. Others reacted strongly to previous "technology push" approaches and their criticism could be summarized as "you are just repeating previous mistakes by promoting forages without giving due attention to the wider value chain". This group felt we should minimize concrete action on the ground and focus on acting as "innovation brokers". Both criticisms had validity but our conclusion was that some balance between these two extremes was needed to achieve change.

- **The need to carefully balance leadership and partnership.** Because the project initiated the stakeholder platform there was a temptation to dominate the agenda. We had to learn to allow joint agendas to develop and for mistakes to be made so that different members of the platform felt they had a voice and some ownership of what was going on.

- **The need for flexibility in the development agenda.** Our initial entry point was fodder development but it soon became clear that other issues were exercising the minds of those in the stakeholder platforms. The breadth of actors participating in the platforms grew to reflect this as the main focus of activities moved from fodder to milk marketing and breed quality at Ada'a.

- **The need for pragmatism.** We learned that planned activities with government line departments did not always work out as expected due to diversion of staff onto other activities related to hierarchical structures within the line departments. We soon came to accept these disappointments and continue despite changes in the people we were working with.

**The need to balance accountability with flexibility.** The stakeholder platforms were set up as informal associations of interested actors and had no formal constitution. As such, there was no formal accountability for following through on agreed actions. At the same time regular meetings to review agreed actions did spur action and demonstrate progress that was being made. We debated whether to formalize the platforms but finally agreed that the informal nature of the platforms was essential to their success. We needed to avoid developing formal structures which would have become cumbersome and counter-productive and undermined the nimble and opportunistic nature of much of the platforms' activities.

**The need to balance resource inputs among stakeholders.** We had constantly to counter the expectation that as a "project" we were an easy source of funds. In order to foster partnership and ownership we had to gradually adjust expectations and encourage different stakeholders to contribute resources to the joint activities of the stakeholder platform. Towards the end of the project this led to devolution of responsibility for stakeholder platform facilitation to the appropriate government line department although funds for this were still required from project sources. The question of sustainability of stakeholder platforms in the absence of external resources is still an open one.

*Syria*

The project strengthened the linkage, and built trust among extension and AKRSP staff at Salameih. At El-Bab public research staff became more active, and a strong linkage was established between extension staff and farmers, and between farmers and traders. At Tal-Amri, public research and ICARDA staff became active. In general, ICARDA assumed additional responsibility for coordinating stakeholder platforms, and women's groups were allowed to participate in project activities.

Innovative capacity for scaling-out and scaling-up of fodder/livestock technologies was strengthened at the pilot sites. Farmers acquired knowledge on fodder and livestock production through cross-site visits and knowledge exchange. The fodder innovation network linked feed producers to traders, feed processors and feed-lot operators which enabled farmers to exploit market opportunities in the fodder-lamb fattening value chain.

Many valuable lessons were learnt that could be use to guide future fodder innovation projects. Fodder innovation networks should be linked to livestock value chains to be more meaningful and attractive to actors. Women play a greater role in small-scale lamb fattening and dairying. Therefore, special efforts should be made to target women farmers and house-wives, and to incorporate gender issues in building fodder innovation capacity.

### *Vietnam*

At the project sites, a comprehensive production and marketing system change has taken place in the last 5 years, transforming smallholder cattle keepers employing extensive grazing systems to market-oriented cattle producers. This example showed that it is possible for smallholders to produce cattle efficiently and compete successfully with commercial enterprises. This transformation was initiated by the introduction of robust fodder species which solved immediate problems and captured farmers' attention. Combining appropriate technical interventions with participatory approaches of working with farmers, broad stakeholder engagement, locally-driven development and a value chain approach fostered the development. Other factors also contributed, including favourable local policies supporting livestock production, increasing wealth in the country which has led to higher meat consumption, and improving infrastructure connecting more remote rural areas with urban centres. Taking forages as the entry point the chain of changes can be described as follows:

1. Urban demand and favourable political environment create a latent supply gap.
2. Farmers are looking for opportunities to improve their income and cattle production is an attractive option because of the relative stable and increasing price of meat, however, labour requirements are high.
3. They plant forages to reduce labour requirements and realise that improving fodder supply also improves animal productivity and produces fatter cattle.
4. Having a readily available fodder resource close to their house enables farmers to keep animals in pens. They also find that they get more money from selling fat animals which stimulates interest.

5. In this process farmers began to get a feel for the challenges and opportunities of defined production (fattening, cow-calf production, etc). A change in perception starts.
6. Market studies show farmers and local traders that there are opportunities in supplying larger provincial and city markets, however, cattle production needs to be further improved to satisfy the quality requirements of these large markets. Farmers start to think about what traders want to buy and how to supply this specific product.
7. These higher standards are difficult to meet with local animals, which are extremely well adapted to low quality feeds at the cost of lower maximal productivity. With no prior experience in breeding, farmers develop interest in improved breeds, their potential and limitations.
8. The introduced penning system allows the introduction of artificial insemination and controlled breeding activities. It also improves biosecurity, reducing the risk of infectious diseases and increases food safety. The collection of manure involves further opportunities.
9. New breeds require further improvement of feeds and feeding strategies (smart feeding).
10. Exchange with other farmers on their experiences becomes increasingly important. Farmer clubs provide a forum for technical advice and are increasingly perceived as a tool that empowers farmers to negotiate better prices with traders.
11. Traders get interested in the possibility of a reliable and constant animal supply of guaranteed quality and agree to invest in contract fattening with farmers.

The change from an asset-based, low-input animal keeping system (cattle keepers) to a commodity-based, intensified animal production system (cattle producers), generating a major share of the total smallholder household income has been completed.

Constant feedback from and interest in farmer activities, progress and constraints motivated farmers to invest more time and thought in the project activities and led to a successful implementation of the first crucial steps. Having only one example site at the beginning, facilitated this process and made an intensive engagement through VLAs and stakeholder meetings easier. As soon as farmers reached step 5 their interest in improving their system was big enough to become proactive and take initiative themselves, meaning that they saw the project no longer as an additional “burden” but as a real opportunity and approached and invited trainers directly to address topics they needed to be resolved. The clearest proof for this change in attitude is that at the beginning of the project farmers expected per diems to participate in project activities, while at the end they offered to pay to get expert advice.

## Scaling Out

### *Ethiopia*

Our focus on stakeholder platforms as the mechanism for project implementation had implications for our scaling out activities. We did not have a scaling out strategy as such since we were keen for innovations to emerge and diffuse through the activities of stakeholder platforms. From the outset farmers were selected by the local Offices of Agriculture and Rural Development for participation in project activities. The local offices also made decisions year by

year on whether and to what extent farmer numbers involved in project activities would increase. This limited the extent to which spontaneous adoption of improved fodder occurred although we did see some spontaneous diffusion especially in Mieso. The numbers of farmers planting forages did increase year on year in Ada'a and Mieso (but to a much lesser extent in Alamata). Such decisions were made by the local OoARD based partly on the degree of interest of local farmers.

The emphasis on innovation approaches in FAP raised a key question when thinking about scaling out. Conventional technology-led projects scale out technologies whereas in our case we were more interested in scaling out processes. This was because we came to the view that scaling out technologies would not lead to the widespread system change we were aiming for. This is because scaling out of technologies relies heavily on the efforts of project personnel and is often carried out in technology-push mode. Experience shows that such approaches do not work ; they are not sustained after project life and do not empower people on the ground to be responsive to changing constraints Our aim was therefore to stimulate local innovation capacity to allow promising technologies and other innovations including organizational changes to spread more spontaneously. Our strong emphasis on allowing local stakeholder platforms to set the agenda certainly paid dividends in terms of the spread of fodder options. It also laid the groundwork for change higher up the value chain. Allowing stakeholder platforms to set the agenda meant that other key constraints such as milk marketing, seed supply etc were addressed. Addressing constraints at various points in the value chain is important if sustainable improvements to farming practice are to occur.

### *Syria*

Public and private research and development staff, and decision makers worked closely with farming communities at the project sites to build innovation networks to scale-out and up fodder options. For example, the directors ED and AWRA became more supportive of scaling-out fodder technologies as the project progressed.

More farmers were growing fodder to feed their animals in El-Bab and Salameih as evidenced by number of farmers adopting fodder technologies and expanding area under fodder. Small-scale lamb fattening and dairy farmers began shifting from feeding barley grain and straw to feeding mixed and balanced rations as supplements. Farmer-to-farmer seed exchange began to increase.

Stakeholders benefited from increased production and sales of fodder and fodder seed. For example at El-Bab, farmers reported a 2-3 fold increase in seed production, income from sales of seeds, and farmer-to-farmer dissemination of seed. Interest developed in the use of triticale for spring grazing due to the higher daily gain of lambs grazing triticale pastures compared with barley. Net revenue from small-scale lamb fattening and dairying systems increased due to adopting improved feeding practices.

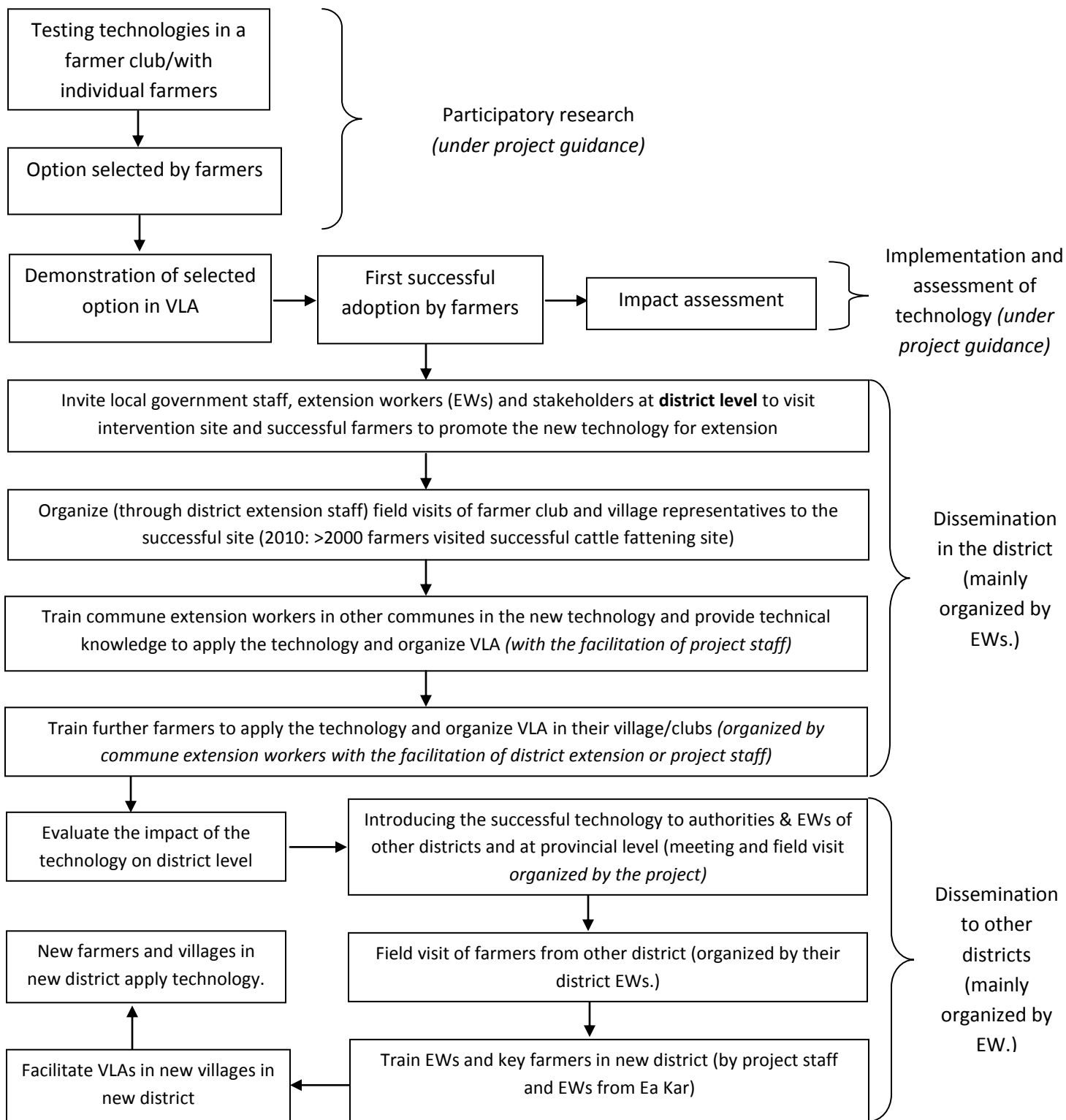
Lessons are that, multi-stakeholder partnerships or innovation networks are essential for effective scaling-out and scaling-up of fodder technologies. Development of seed multiplication systems, especially at village and community levels, and where appropriate, facilitated links with private seed companies, should be an integral part of any forage-livestock improvement initiative. Animals are the ultimate economic channel for fodder production; therefore more benefits must be delivered through efforts in animal nutrition in fodder related projects.

### *Vietnam*

Scaling out implies that there is something – a good example - that can be outscaled, however, ‘photocopying’ successful examples seldom succeeds. In Vietnam the key to successful up-scaling was to (i) have a convincing example in Ea Kar that showed that it was possible for comparable smallholder farm families to produce high-quality cattle competitively, (ii) build local coalitions for development which facilitated the adoption and development process, (iii) strengthen the capacity of local stakeholders in facilitating the fodder and cattle development process, supporting farmers in technical issues, and developing market access, and (iv) support stakeholders at new sites by linking them with experienced counterparts in Ea Kar and as well as linking them with other project participants in an informal network of professionals.

A useful tool to interest new farmers in improving forage and animal management systems were Village Learning Activities (VLA). Through the direct exchange between farmers and the chance to see the outcome of the introduced intervention, trust in the methodology and the opportunities in terms of economic benefit could be gained or strengthened. In livestock production interested farmers usually started to use forage based systems after these visits. Another important process was the involvement of the Vietnamese Social Bank which provided credit to traders to finance contract cattle fattening activities of indigenous farmers who were too poor to afford the initial investments in animals for fattening. Although the financial support of the bank was limited due to restricted resources, the model of indirect micro crediting for farmers without access to a credit system was very successful and showed a new financial model to support extremely poor smallholders. Collaboration with a large, international investment project was a third and likewise fruitful union to support a sustainable out scaling of project technologies.

The general out scaling scheme applied in this project could be described in the following way:



## Market evaluation and development

### *Ethiopia*

In Ethiopia we focused on fodder as a commodity when conducting market appraisals. In retrospect this was probably not the best approach. We missed opportunities to evaluate market opportunities for livestock products such as milk and meat and this was a weakness of our work in Ethiopia. Some solid market appraisals for milk and meat at phases during project life would have paid dividends in terms of focusing our activities and targeting feed interventions to particular markets. One constraining factor was the capacity of our national research partners to conduct market level studies. We attempted to build this capacity through training but there is still some work to do in this area.

Despite some shortcomings in formal market evaluation we did note some significant successes in market development through the activities of the local stakeholder platforms. Farmers in Godino were relatively isolated from nearby urban markets at the start of the project but as the project progressed, we saw innovations in the area of farmer organization and in terms of procurement arrangements for milk. At the time of writing this report, Godino farmers are now regularly selling milk to Ada'a Dairy Cooperative with benefits for both farmers and the coop. Our experience has been that the diversity of voices in local stakeholder platforms helps to identify value chain constraints and ways of overcoming them.

### *Syria*

Follow-up visits to project sites indicated greater interaction between market participants (fodder/forage seed producers, processors, feed-lot operators, sheep breeders), especially at El-Bab. Innovation platforms created by the project have linked producers to traders and feed processors allowing farmers to access the growing fodder market and livestock markets. The main lesson is that, future fodder innovation projects should consider the production-to-consumption chain, and promote market-oriented village enterprises such as village-based seed production, lamb fattening, hay making, and dairying.

### *Vietnam*

To identify the market situation in the intervention areas, Rapid Market Appraisals (RMAs) and a participatory market study were carried out, as described earlier. The RMA were conducted at two levels:

- At local level: interview and group discussion with farmers/farmer groups, Trader/trader groups and authorities
- At intermediate and destination markets: interview involved traders, slaughterhouses, market retailers, super markets, and consumers.

The Participatory Market Study brought different stakeholders together and facilitated visits of slaughterhouses and large traders at destination markets to create an understanding for the dynamics of cattle trading, pricing and cattle selection. In a second step, traders at destination markets were invited by project and extension staff to visit producers at farmer clubs to teach them what type of cattle met the market demand. This activity culminated in setting up a cattle production contract between traders and farmer clubs.

The resulting benefits from these activities for farmers were access to market information, demand oriented cattle production (knowledge of what is needed), better understanding of how prices were set, and a clear production plan. As an immediate result an information sharing relationship was built between two farmer clubs, local traders and large traders in Da Lat city. Local traders started to invest in a very poor farmer club (Chu Cuc club) and the farmers of this club could immediately start to produce for this trader. A long term result was contract farming between farmers clubs and traders, trader feedback on production and improved cooperation and trust among producers and between producers and traders.

Essential for the success of this activity were three points:

- The offered technologies has to have the potential to benefit not only farmers but also other stakeholders, of which farmers, traders, extension workers and local leaders are the most important ones
- The interventions have to link with the duties and interest of the local government to get their support
- Stakeholder meetings and analyses organized by extension staff provided a continuous interaction between stakeholders. The role of extension and project staff to encourage and facilitate the sharing of information among them brought benefits to the involved parties and was very important to maintain and fortify their relationship.

In general and as a result of these studies it can be said that the market development in the region is fast and sharp set. The fast rise of commerce and industries led to a strong increase of economic power amongst a growing middle class, entailing also changing consumption patterns including increased demand for meat. Still, due to complex trading systems, with often several sub-traders and collectors involved, margins in meat production are not very high and traders try to optimize their benefits by sending only full truck loads to their destination markets. This forces them to find enough animals of similar quality for each transport while at the same time competing with each other and opens up opportunities for farmer groups to secure a stable income independent of market price shifts which traders are willing to pay if supply is guaranteed. Contract farming by traders or meat companies at the same time could be one model for a way out of the poverty trap for the poorest smallholders.



## 9. Links with IFAD Investment Projects

### *Ethiopia*

In Ethiopia we made various efforts to engage with IFAD investment projects. Our success in this area was less than we had hoped. One key mechanism for engaging IFAD Ethiopia was to include the IFAD Field Officer on our Local Advisory Committee. This certainly raised our profile within IFAD but we found it difficult to engage project personnel. Partly this related to structural issues: we were a relatively small project in Ethiopia and the regional nature of our project meant that IFAD Ethiopia may not have felt much ownership of what we were doing. Timescale was also an issue: projects such as the Participatory Small-scale Irrigation Development Programme and the Agricultural Marketing Improvement Programme were ongoing and exerting influence on them was challenging. We were however invited to participate in a Country Programme Review in Dec 2009 and had the opportunity to present an update on our work. We also participated in various stakeholder consultation meetings organized by IFAD Ethiopia.

### *Syria*

In Syria, links were established with IFAD development projects from the beginning to the end of the project. Directors of the North-Eastern Region Rural, Idelb Rural, and Badia Rangeland development projects were invited to the national and provincial workshops which decided on potential partners and project sites. The IFAD Country Representative was a member of the NAC. Staff of the IFAD development project also participated in all the short-courses and workshops organized by the project. Furthermore, the project organized a round-table workshop involving directors of all the four investment projects to discuss collaboration. The links facilitated knowledge exchange between projects, and extension of project outputs beyond the provinces where the fodder project was implemented.

### *Vietnam*

As already mentioned earlier, the Ky Anh learning site in Ha Tinh was selected as it could be embedded in the IFAD-funded loan project IMPP (Improving Market Participation of the Poor) and first approaches for a possible collaboration were undertaken early. As project activities in Ha Tinh progressed, agreements were reached between FAP-Vietnam and IMPP with the aim of extending project activities to selected IFAD areas in Ha Tinh, particularly beyond the borders of the project's focus district Ky Anh. The IMPP then funded training and on-farm activities while the project supplied trainers and mentors. This link was one of the most important steps to help extending project outcomes beyond the district borders and putting them on a more sustainable base in this province. The technologies developed in the project in this province are now further extended by IMPP. Further monitoring of these activities is recommended.

## 10. Concluding remarks

The Fodder Adoption Project provides some useful case studies of approaches to feed development in smallholder systems. The project was conceived at a time when a new paradigm for rural development, the innovation systems approach, was emerging. As the project evolved and activities got underway, elements of innovation thinking found their way into project implementation to varying degrees in different countries. One result of this was a dual emphasis on technical aspects of forage supply on the one hand and stakeholder processes on the other. This coupling of technology and innovation represented a middle road between technology-push approaches and pure innovation systems approaches. This combination was the key element of the successes we observed in bringing about system change and perhaps the major “result” of the project. Some of the thinking and lessons emerging from FAP are now being incorporated into the design of a new project soon to be funded by IFAD entitled “Enhancing dairy-based livelihoods in India and Tanzania through feed innovation and value chain development approaches (MilkIT). This project will involve the use of innovation platforms from the outset, but will have a stronger element of participatory analysis of value chain constraints along with action research to address these constraints. Furthermore we anticipate greater coherence between project countries, India and Tanzania, and more active engagement with development partners in facilitating innovation processes.