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***“Strengthening Institutional Capacity, Extension Services
and Rural Livelihoods in the Central Dry Zone and
Ayeyarwaddy Delta Region of Myanmar”
(ASEM-2011-043)***

***Learning Alliances in Agricultural Research and
Development for Rice Crop and Livestock Sector in
Myanmar***

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Evaluation of Impact of Learning Alliance Group on Rice Farmer Livelihoods in Maubin Township, Myanmar

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Abstract

This study primarily focused on a learning alliance at local scale of post-harvest technologies in rice production. In December 2015, the first interviews with stakeholders (farmer, miller, DoA extension staff, DoA, plant protection and trade officers) were conducted in Pan Pin Su and Nya Gyi Gayat villages. The questionnaire for the individual stakeholders was prepared to overview their perceptions of the objectives and incentives of the LAs established in 2013/14, and the impact of these LAs. Focus group interviews were also conducted, using a semi-structured questionnaire, with rice growing farmers in these two villages and information was collected on demographic and economic factors, and problems and constraints experienced by the farmers. Farmers' perceptions of the objectives and incentives of the LAs and the impact of the LA group were also observed. A second round of interviews was conducted in September 2016, to collect data on the further development of the LA process. Based on the activities conducted by the learning alliance group of Maubin from 2013 to 2015, farmers in the LA groups of Maubin and Daik-U Townships developed business plans for the sustainable use of postharvest equipment and generating income by providing postharvest services to other farmers. This learning process improved the capacities of stakeholders in the rice value chain and provided an enabling environment for them to explore ways of working together and with other interested groups. Farmers also realized that they could be value chain participants with a more active role in determining the profits they make from their harvests. The inclusive learning approaches also created new and trusting alliances among rice value chain stakeholders who share the goal of launching Myanmar back into the rice export market. The LA approach was useful in building bridges between farmers, researchers and extension workers in the specific context of rice-farming in Myanmar. Although the LA was valuable in linking technical and socio-institutional innovation, and fostering self-directed learning and experimentation with a broader agenda, it was not observed to be a perfect solution for making research more inclusive. Furthermore, activities planned for farmers should be consistent with the actual conditions experienced by the farmers and whether the farmers can afford to undertake such activities given their limited resources. In addition, for technological transfer to occur, the technology and equipment should be introduced at a time and in ways relevant to local situations.



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1. Introduction

1.1 Background

Farmers have been developing agricultural practices and innovations since the beginning of time. They have developed many agro-ecological procedures and marketing systems, and invented useful devices. Most agricultural technology in use throughout the world has been the result of innovation based on experiential need and inspiration of farmers, and then industrial development. The spread of agricultural technology has resulted from farmer-farmer interaction and, since the early-twentieth century, the development of corporate business, academic research and aid to non-industrial countries.

Various types of extension models have been used, since the mid-twentieth century, to facilitate the adoption of agricultural innovations. One, relatively recent extension model to be utilized is the Learning Alliance. Learning alliances in agricultural research and development involve a broad range of stakeholders, including government organizations, NGOs, and the private sector, who form a 'platform' for building capacity through sharing new scientific findings, identifying knowledge gaps, and exchanging experiences about successes and failures of research and development projects. The Learning Alliance (LA) is characterized by an iterative learning cycle within and among small groups in the LA network. A key part of a learning cycle involves a facilitated reflection activity on what happened for stakeholder participants, what was experienced, and what results can be used for future planning and implementation activities.

In Myanmar, the LA model provides a way for stakeholders in the rice value chain to work together and cooperate to increase adoption of technologies, facilitate stronger partnerships, and use resources sustainably. Using a LA, the International Rice Research Institute (IRRI) has facilitated a network of stakeholders to improve postharvest rice management in Myanmar. This LA, composed of farmers and IRRI's local partners from the rice value chain, aimed to produce better quality rice and sell it to larger markets for higher prices. The Irrigated Rice Research Consortium (IRRC) facilitated the exchange of learning among various stakeholders within this LA, and has continued such facilitation in different projects in Myanmar through impact pathway workshops and village-level learning alliances.

Two Participatory Impact Pathway Analysis (PIPA) workshops were held during 2013: one in Bogale on 11-12 July and another in Maubin on 2-3 December. Representative farmers



from project villages, village leaders, and staff from extension institutions, NGOs, millers and local manufacturers joined these workshops. Participants from different sectors initially identified the underlying causes of a shared problem: that farmers were not producing good quality rice and that rice production was not profitable. After that, these participants examined opportunities, formulated their visions of success, and mapped the network of people in the value chain of the relevant community. The findings and ideas of all participants were then collated, and possible pathways for change were formulated to overcome the shared problem. Finally, participants identified strategies by which the project could facilitate change for different groups in each pathway workshop. At the end of each PIPA workshop, participants discussed forming a village-level LA for activities on specific topics. Accordingly, these village-level LAs started focusing on improving rice quality and linking with better markets.

1.2 Rationale for this research

This research aimed to investigate the formation, operation and effectiveness of a LA involving multiple stakeholders who wanted to enhance aspects of smallholder livelihoods. In this research, the opportunities for knowledge sharing, innovation, co-learning, and capacity building among participating stakeholder groups were investigated. The research also tracked how sharing scientific knowledge translated into useful knowledge for developing and improving smallholder livelihoods. This study focused on a local-scale LA, in Maubin Township, interested using good quality seed and postharvest technologies for rice production.



1.3 Objectives of this research

The objectives of this research were to:

1. identify stakeholders' expectations, needs, and incentives for participation;
2. analyze the institution-building process;
3. identify opportunities for co-learning and capacity development;
4. identify Regional Learning Alliance (RLA) innovation processes; and
5. distil lessons learned for further RLA development.

2. Design and Methods

2.1 Description of the project area

The study area was the Maubin Township in the Ayeyarwaddy Region, Myanmar. The Ayeyarwady Region occupies the delta of the Ayeyarwady River and, with more than 6.5 million people, is the most populous of Myanmar's states and regions. The principal crop of the Ayeyarwady Region is rice, so the region is called the "Granary of Myanmar." In addition to rice, other crops include maize, sesame, groundnuts, sunflowers, beans, pulses, and jute.

Maubin Township is situated between 16°30" and 16°57" North and 95°24" and 95°52" East, and is a port, protected by flood-control embankments, on the west bank of the Ayeyarwady River Delta of Myanmar's southern coastline on the Andaman Sea. Maubin Township has an area of 515.38 square miles, including 330 thousand acres of arable land; and has 76 village tracts which include 470 villages. Maubin Township is bordered by Twantay and Nyaungdon Townships to the east, Wakema Township to the west, Kyaiklat Township to the south and Pandanaw Township to the north. Rice growing and fishing are the major contributors to the economy of Maubin Township. The town is linked with Yangon, 40 miles (65 km) east, but is a developing town with growing transportation and communication services. This research project was conducted in four villages of Maubin Township: Pan Pin Su, Nya Gyi Gayat, A Lann, and West Tar Pet.



2.2 Data collection

Both primary and secondary data were collected for analysis. The secondary data were collected first, from sources at the Local Township and village tract level, and government and non-government organizations related to agriculture and administration. These data provided for a review of LA activities in the study area during 2013-15, and supported responses by survey participants interviewed for the second stage (2015-2016) of this research.

In December 2015, the first interviews with stakeholders were conducted, in the two study villages Pan Pin Su and Nya Gyi Gayat. Different kinds of stakeholders (see Table 1) were interviewed individually. The questionnaire for the individual stakeholders was prepared to overview their perceptions of the objectives and incentives of the LAs established in 2013/14, and the impact of these LAs. Focus group interviews were also conducted, using a semi-structured questionnaire, with rice growing farmers in these two villages. During focus group interviews, information was collected on demographic factors, economic factors, and problems and constraints experienced by the rice farmers. Farmers' perceptions of the objectives and incentives of the LAs and the impact of the LA group were also observed. A second round of interviews, using the same questionnaires as in the first round, was conducted in September 2016, to collect data on the further development of the LA process.

Table 2.1 Summary of stakeholders interviewed

<u>Type of Stakeholder</u>	<u>Number of Stakeholders</u>
Farmers	17
Millers	2
Extension staff (Department of Agriculture, DoA)	3
Township officer (DoA)	1
District officer (Plant Protection, DoA)	1
Township officer (Ministry of Commerce)	1
Total	25



2.3 Analytical procedures and statistical methods

2.3.1 Stakeholder analysis

A Stakeholder Analysis was performed, based on data collected during the first round of interviews with individuals and focus groups, using a process which:

1. listed all the names of the stakeholders, including individuals, groups and institutions, who had any relationship to the LA project of the IRRI;
2. categorized the stakeholders into groups, based on the criteria set by participants for the project, such as beneficiaries, implementers, decision-makers, funding agencies, collaborators, potential opponents, and negatively affected groups (groups having the potential to be negatively impacted by the project); and
3. conducted a focused analysis of the important stakeholders regarding their characteristics, problems, strengths, weaknesses, opportunities and external threats.

3. Research Findings

3.1 Review of Learning Alliance Project Activities in Maubin During 2013 to 2015

A variety of stakeholders were invited to be involved in the Maubin LA, including: farmers, extension staff and officers of the Department of Agriculture (DoA), a Plant Protection Department officer, the Agricultural Development Bank officer, and seed producers. Stakeholders from the community's private sector, such as millers, traders, service providers and manufacturers of threshers and dryers, were also involved. IRRI researchers, who facilitated the LA, managed invitations to participate in the LA network. Involvement was voluntary, depending on stakeholders' interests in the discussions and possible activities.

In December 2013, the first LA meeting was held in Maubin, with the 46 participants being NGO staff, millers, farmers and project staff. The topics of this initial LA meeting were threshers and seed varieties. The participants were divided into two groups: dryer operators and users. The dryer operators raised technical questions, regarding the operation of dryers, with IRRI scientists and the dryer manufacturers, and discussed management issues. The users discussed their interest in utilizing a dryer, and making the service available to farmers from eight surrounding villages. The users also discussed initial fees needed to sustain dryer operations, so they might develop incentives for farmers to dry and obtain higher quality grains; scheduling and coordination of dryer use; and information needs of farmers.



The second Maubin LA meeting was held in March 2014. This meeting was to review the first learning cycle, and plan for the next. The meeting was attended by 35 participants, including farmers, millers, extension workers from the DoA, officers from the Regional township level of the DoA and Agricultural Development Bank, representatives from the private sector (Traders Company, Milling Company) and IRRI researchers. The farmers, from four project villages of Maubin (Pan Pin Su, Nya Gyi Gayat, A Lann, and Nyaung Wine), discussed their experiences from rice and pulse variety trials. IRRI representatives also shared their experiences of working with farmers on the different project activities. Millers argued about the present quality of Maubin rice and the relation between rice quality and price. One miller explained that Maubin rice was of very low quality so traders were not interested in buying it. Another miller described the reasons for the low price, saying that the low price was caused by delayed harvesting. The other reason was the purity of seed, with mixed grains contributing to the low price and reduced quality at the milling stage. One of the last activities of the meeting was a group exercise for the participants, to identify their preferred project activity and the main concerns they wanted addressed in relation to that activity. Each group then focused on learning activities which could support other ongoing activities (see Tables 2 and 3).

Table 3.1 Ongoing activities for Nga Gyi Gayat

Activity	Concern/s
Pure seeds	Seed availability for farmers and market price.
Technologies	What drying/threshing machines are suitable for which activities, and what techniques need to be applied? Money problems to buy the machines.
Support	Skilled labor is needed when using the machines.
Market	Using fertilizers without guaranteed/safe credit support. No fixed/guaranteed market for the harvested crop.



Table 3.2 Ongoing activities for Pan Pin Su

Activity	Concern/s
Want to try the Sin Htwe Latt variety of rice	How to control “leaf rot” disease especially during periods of heavy rain.
Want to do a Participator Variety Selection (PVS) trial suitable for their rice farming system (lowland, upland)	Different soil types.
Establishment methods	Different land levels and soil types.
Fertilizer trial; which fertilizer should be used?	How to do the trials? Need to learn the techniques.
Herbicide/pesticide trial	Need to learn (knowledge).
Transportation from field to home.	Poor transportation.
Threshing to be finished (5-10 acres/day).	Not enough time for threshing in short periods and for sowing pulses.

The third activity of the Maubin LA was a wholesale and export market visit., conducted in May 2014, and attended by farmers from Maubin and Bogale Townships. This market visit was conducted to increase awareness of rice quality and markets, as well as facilitate interaction between farmers and traders. During the visit, farmers interacted with traders to learn about rice quality, varieties, price and production logistics. Participants confirmed their learning from this activity and tried bulk-selling activities, but only at local markets. While this first bulk-selling event was successful, farmers needed further support to strengthen their linkages and be able to sell at wholesale markets in Yangon. Farmers also shared the need to increase the number of farmers who have first-hand knowledge of the Yangon market and the quality requirements for selling there.

In February 2015, a second learning visit was conducted, as a two-day study tour program. Four participants included Maubin farmers, as well as farmers from Bogale, Mawlamyinegyun and Shwebo Townships. On the first day, 31 participants visited Hmawbi Seed Farm. The farm manager gave a presentation about the rice varieties planted on this seed farm, including Sin ThweLatt, Sin Thukha and Paw San varieties. The Maubin farmers also shared their experiences and asked questions related to crop management and suitable



rice varieties. Shwebo farmers shared their experiences of good quality rice and markets with farmers from Bogale and Maubin, and discussed these experiences in the context of technologies they have tried from the IRRI project. Thus, farmers from various areas had a chance to exchange their different experiences. Farmers from Maubin Township then planned for activities focusing on the new practices they wanted to try on their own farms, including:

- ploughing and leaving the fallow under the sun;
- which seedbed method
- different plant spacing (6 rows, 1 row blank);
- systematic fertilizer application;
- collecting main panicles for seed (seed selection);
- keeping purified seed row seeding;
- harvesting on time, sun drying, and storing; and
- using a drum seeder.

The participants in the first day of the tour, enumerated their key learnings to be about:

- dry plowing;
- transplanting by hand (and now wanting to try it);
- new varieties; and
- good water management (drainage and irrigation).

On the second day of the tour, the participants visited a wholesale market in Wardan. Participants interacted with the traders from the different townships and inquired about the price, quality and mechanism of trading. Participants then gathered at the IRRI-Myanmar Office to share their reflections and lessons learnt from the two-day activity.

The third meeting of the LA was held in Maubin Township on May 2015. Thirty-six participants attended the meeting, where they documented their learnings from the summer harvesting season, discussed postharvest losses to alliance members along the value chain, and shared key learnings from the market visit. During the meeting, farmers chose and discussed a topic of interest to them that related to rice quality and marketing. They also discussed differences between combine harvesting and traditional harvesting in terms of harvesting, hauling, transportation and threshing fees, and labor requirements. Central to the discussion was the lack of trust among traders, millers and farmers. Towards the end of the meeting, the ACIAR MYRice project review team discussed with the farmers how the project



could further help them relative to their existing problems. Topics proposed by the LA members from Nga Gyee Gayat and Pan Pin Su for future learning opportunities were:

- land leveling,
- effective weather forecasting for better crop management,
- knowledge about insect pests,
- irrigation needs,
- modernized farming,
- access to pure seed sources for rice and pulses,
- suitable rice varieties,
- market access for export of Sin ThweLatt rice variety, and
- crop insurance.



3.2 Outcomes of the Stakeholder Analysis

The stakeholder analysis showed that the groups of stakeholders involved in the Maubin LA could be characterized by their objectives, roles and activities, expected returns or benefits and what they expected to see improve as a result of being involved in the Maubin LA (see Table 3.3).

Table 3.3 Summary of objectives, roles and activities, returns from and noticeable improvements expected by each stakeholder group, with respect to their involvement in the Maubin LA

Stakeholder group	Objectives of stakeholders	Roles and activities of stakeholders	Returns from participation in the LA group	Noticeable improvements
Farmers	<ul style="list-style-type: none"> - To improve current production practices. - To develop their knowledge by collaborating with (and contributing their experiences of pre- and post-harvest technologies, and marketing channels for rice) the research station. - To maximize their profit by improving rice quality. - To develop the agricultural sector by approaching production from a different point of view. 	<ul style="list-style-type: none"> - Variety trials. - Deep-water rice demonstration. - Demonstration of rice threshing machine - Demonstration of rice dryer. - Research on post-harvest losses because of the stacking System. - Study tour to Bayintnaung and Wardan wholesale markets. - Excursion to Hmawbi Rice Research Station. - Participation in farmer training (importance of good quality seeds, fertilizer utilization and post-harvest technologies). - Field visit exchange program and 	<ul style="list-style-type: none"> - Technology to improve seed production. - Technology for systematic usage of good quality seed. - Production of improved quality seeds. - Improved market bargaining power for products. 	<ul style="list-style-type: none"> - Using good quality seeds. - More systematic production practices. - Commence practice of soil fertility management. - Knowledge of wastes and losses of conventional harvesting practices, and commitment to reducing those wastes. - Awareness of the quality of paddy needed for improved rice quality.



		sharing of experiences.		
Rice millers	- To be more effective in rice grain production and increasing farmers' incomes.	- Distribute good quality seed. - Training and sharing knowledge on operation of postharvest rice processing.	- Improved technologies and knowledge.	- As farmers are more interested and grow better quality seed, the quality of rice improves and is easier for the millers to process.
Extension staff (DoA)	- To provide more benefits for the farmers.	- Assist in inviting farmers to and planning for meetings. - Assist in selecting the key farmers and areas for trials. - Coordinate activities involving farmers and IRRI staff.	- Know how to perform a research trial. - Understand postharvest technologies - Understanding postharvest losses.	- Able to build mutual trust with the farmers and become better at providing extension services. - Obtain improved seed production technologies.
Township officer (DoA)	- To gain success through cooperating	- To maximize the yield of improved and more marketable crops.	- Knowing and understanding the LA group and its functions.	- Supporting the requirements of participants in the rice value chain (farmer, brokers, millers, etc.) by cooperating with the LA.
District officer (PP, DoA)	- To discuss and solve current problems of output by rice farmers.	- Explain and provide plant protection technologies.	- Knowledge of the LA group and its functions.	- Knowing that cooperation can create a better working environment and conditions.
Facilitator (IRRI)	- To have all stakeholders along the rice value chain (from producer to end user) participating in the LA.	- Organizing and facilitating the LA meetings and encouraging all members to participate actively in discussions. - Collecting proposed activities for the future from meetings; and planning who will implement each activity, where and when.	- Farmers having bargaining power in the market place and knowing that they can obtain higher prices if they produce better quality products.	- Mutual understanding, the most important tool for development, achieved between LA members.



3.3 Outcomes of LA activities

There were delays in the implementation of activities agreed upon at the LA's first meeting. Farmers were to explore new types of threshers (see 3.1) but this was postponed, for two reasons. Firstly, local production of the IRRI-designed thresher (trial unit) was not completed as specified and did not work. Secondly, the importation of threshers into Myanmar took time. However, alliance members embarked on other learning activities identified at the first LA meeting: producing better quality grain through good postharvest management. Representatives from different groups, (e.g. farmers, millers, manufacturers) took the opportunity to gather for meetings and discuss relevant issues and technologies. During their meeting to share experiences with different rice varieties, for example, farmers reported their observations of the various plants or the plants' suit abilities for specific agro-ecological conditions. However, no information could be provided on the yields of the different varieties as the data were still being collated and processed. Local DoA staff listed the three rice varieties farmers were most interested in growing, out of thirteen possibilities. This opened discussion with millers and government members of the alliance, who commented that of the three chosen varieties, Sin Thwe Latt was more marketable because the "millers know about it", or "the government has opened the possibility for export of this variety"

From these discussions, the farmers decided what they planned to do next, as did the millers. Different learning activities were to be implemented by the different groups and it was up to each group to decide what they wanted to try, when, and how extensive their trials would be. One miller, for example, set-up a trial in collaboration with farmers, in which the miller bought fresh grain from these farmers and processed it using improved postharvest practices. The miller then milled the grains to assess the quality of the rice and the profitability for millers considering the quality of grains received from the farmers. The LA members subsequently discussed the observations and experiences of both farmers and millers. One experience showed that, even with good postharvest practice, paddy bought from farmers required additional milling because red grains were mixed in it. Grains had to be sorted and re-polished to obtain uniform white grains. The miller had calculated the costs and returns for such impure paddy, and showed how much profit was lost.



Discussions between farmers and millers on quality requirements, variety preferences and pricing continued during subsequent learning alliance meetings. Millers shared which varieties and rice qualities were preferred and encouraged farmers to plant a variety which they can sell in bulk. This contrasted notably with the common practice by farmers, of using a variety suited to location-specific conditions, and indeed using several varieties if they had plots with differing conditions. It also contrasted with the practice of planting varieties with differing times to maturity, to manage labor needs during the harvest period.

The farmer-managed trials were focused on rice varieties. Aside from seed varieties, no inputs or crop management protocols were specified for farmer-managed trials. The farmers implemented their trials and activities on their own, and collected information on trial outcomes which they shared at LA meetings, and from which researchers collected data on management practices and outcomes.

In addition, the LA had activities for learning about markets and seed sources. Farmers interacted with millers and traders at the wholesale market in Yangon and with a nearby seed farm. They also explored which varieties could be sold for a good price.

From these LA activities of 2014, some farmers decided to produce Sin Thwe Latt variety and focus on achieving good quality paddy, to see if the price would be different. This activity integrated farmers' learnings to date about rice varieties, some crop management technologies, postharvest practices and market practices. To support the farmers in these endeavors, local IRRI staff facilitated interactions with farmers from the Shwebo area. Shwebo is known its production of good quality rice and the Shwebo Paw San variety receives high market prices. In addition, unlike farmers from Maubin or Daik Oo, Shwebo farmers could access line traders for the wholesale market in Yangon. The aim of the exchange with farmers from Shwebo was to learn from other farmers about the integration of variety, crop management practices, marketing and bulk selling. Farmers from Maubin were also able to share their experiences with the new technologies they had tried.

Aside from field trials, farmers were linked through other activities, such as a different seed production project of DoA, sales of pesticides, or simply sitting together and discussing things as friends. Many of the trial plots were in front of areas where farmers normally converge in the afternoon and evening, further facilitating sharing of information and experiences. Farmers also had facilitated interactions with groups such as millers, seed



producers and manufacturers also involved in the learning alliance. However, farmers did not interact with these stakeholders as frequently as they did with the researchers. Thus, there were several communities of practice involved in the interactions of the LA but the frequency of interactions between these various groups and the farmers were different.

As a result of the LA activities during 2014 and the first half of 2015, farmers' rice production improved noticeably. This was due to the increased use of good quality seeds, being more systematic with their production practices, undertaking soil fertility management practices, knowing about the wastes and losses of conventional harvesting practices and being eager to reduce those wastes, and being aware of the quality of paddy needed to improve end-stage rice quality. For the rice miller, as the farmers became more interested and grew better quality seed, the quality of rice has improved and is becoming more profitable to use in milling activities. Extension personnel have also built relationships with the farmers based on mutual trust, and become better at performing extension services. Extension staff also had opportunities to learn about new technologies, such as production of better quality seed, for their own benefit. All stakeholders have realized that cooperation can create a better environment and conditions for all.

3.4 Influential personnel connecting different stakeholder groups

Among the LA member groups, the DoA extension officer was a facilitator who operated between all other groups. Due to its government mandate, the DoA has strong links with the Agricultural Development Bank and farmers, as well as with the private sector. It thus has an influential role. Also, the DoA extension officer can recommend and provide seeds of new varieties provided by the government, and products such as pesticides and fertilizers are included in interactions between the officer and farmers. The officer also coordinates arrangements for credit, irrigation and even transplanting. Indeed, the release of loans from the Agricultural Development Bank is contingent upon the DoA extension officer signing the list of farmers planting rice for a particular season. The bank then releases loans to the farmers on that list. The officer also liaises with the irrigation department for the release of water such that it synchronizes with the cropping schedule.

The local IRRI Project staffs were also facilitators linking farmers and researchers. These IRRI staff administered the protocols for and implementation of plot trials,





summarized research data, and convened farmer meetings. These staff supported the connection between research practices and practices of farmers, and promoted recommended technologies to the latter. The IRRI staff also facilitated links between farmers and other stakeholders such as millers and manufacturers.

Cooperative farmers provided links between the farmers and other groups. These cooperative farmers use their farms and trial plots to demonstrate and communicate their own reflections and recommendations. Some of these farmers are seed producers or retailers of pesticides and fertilizers, and they could also use these products to convey specific messages (which may or may not be related to the objectives of the project). These farmers obtain training and technical support from the DoA as well as agrochemical companies. In some cases, they also get support for their use of fertilizers and pesticides.

A few millers and manufacturers also liaised between the farmers and the private sector. In these interactions, millers and manufacturers used market practices and quality standards as discussion tools to create connections between themselves, researchers and farmers. From these interactions and connections with the private sector, farmers were able to link with other market players, or obtain seeds and inputs.

3.5 Business Models arising from LA activities

During 2015, farmers in the LA groups of Maubin and Daik-U Townships developed business plans for the sustainable use of postharvest equipment and generating income by providing postharvest services to other farmers. Eleven farmers created practical business frameworks for utilizing threshing, drying and storage technologies developed by IRRI. The plans were formed with assistance from the DoA and IRRI's postharvest group. Through the LA (supported by the IRRI project on diversification and intensification of rice-based cropping systems in lower Myanmar (My Rice), and the Australian Centre for International Agricultural Research), IRRI will lend threshers, solar dryers and hermetic storage equipment and materials to the farmer groups who, in turn, will provide postproduction-related services to other rice farmers. The farmer groups will then use their earnings to pay for the equipment through My Rice. Using this approach, which is similar to leasing, IRRI can demonstrate the viability of the business model without the need for an upfront investment, which is unrealistic for farmers who are already taking considerable risks in trying new technology. To support the farmer groups, My Rice will provide (through the LA) technical assistance and



advice on managerial issues that might occur during the piloting process. The farmer groups intend to validate and refine the initial business model developed during the April 2016 harvesting season, to improve future provision of postharvest services to farmers.

4. Conclusions and Recommendations

Farmers have invented and developed many technical devices, machines and procedures, without a need for modern science and formal research. Prominent among farmers' innovations and developments is farm machinery and, indeed, most of the agricultural technology in use throughout the world has come from informal field-based innovation. In turn, scientists often base their research on technologies developed by farmers. In the case of the Maubin LA, it was found that farmers actively discussed the farm machinery provided by IRRI and made adjustments to the machinery to adapt it to their field conditions. Furthermore, 90 percent of the technologies developed and promoted by IRRI have been brought from Asian farmers to IRRI, by Asian researchers visiting IRRI for a one-year sabbatical (Goodell 1982).

This research confirmed that the most successful researcher-developed technologies were those that the key stakeholders modified the most. Therefore, a co-development model is needed in which the key stakeholders and formal researchers construct a technology together, particularly in the adaptation phase. The improvements and adaptations made by farmers should be monitored, relayed back and assessed by formal research, to crystallize and disseminate the specific principles or lessons developed. Farmers' learnings arise from the activities which constitute their day-to-day practice, and are experiential rather than experimental. Unlike researchers, farmers live and work on their farms; they have more time for observation and have the potential advantage that their unintentional perception may go hand in hand with intentional analysis, innovation and adaptation.

Overall, the joint learning process brought about by the PIPA workshops and the LAs provided outstanding networking technology which all stakeholders could use. This learning process improved the capacities of stakeholders in the rice value chain and provided an enabling environment for them to explore ways of working together and with other interested groups. Through this experience, farmers realized that they could be value chain participants with a more active role in determining the profits they make from their harvests. The



inclusive learning approaches also created new and trusting alliances among rice value chain stakeholders who share the goal of launching Myanmar back into the rice export market.

However, this study observed that it can be difficult for professional researchers to know farmers' preferences and to understand the complexity of farmers' situations. However, farmers can express the problems they perceive to be relevant, and scientists and farmers need to connect to describe problems for research so that research proposals and activities are formulated to solve problems of the end-users. It is essential to transfer major responsibility for adaptive testing to farmers, who should be encouraged to evaluate and adapt research outcomes and technologies to their own needs using their own ideas, methods and economic options. Farmers also have an advantage in disseminating agricultural innovation and can assist researchers and industry with this. Farmers consider it risky to adopt innovations coming from socially distant outsiders, compared with those innovations developed or promoted by other farmers. Therefore, where farmers working with researchers have acquired useful new knowledge, they can share it orally through their many social networks.

The LA approach was useful in building bridges between farmers, researchers and extension workers in the specific context of rice-farming in Myanmar. The LA interactions led to a largely research-led mode of learning, about agronomic processes, through engaging farmers in experimentation and demonstration plots, implementation of protocols, discussion of technologies, and presentation of research data. This approach supported explicit learning and adaptation evidenced by an evolving technical learning agenda and reflection by farmers on their agronomic adjustments. The LA expanded the number of stakeholders with whom farmers interacted and within this broader network, the learning agenda of farmers expanded beyond the initial concerns or interests targeted by the project.

Although the LA was valuable in linking technical and socio-institutional innovation, and fostering self-directed learning and experimentation with a broader agenda, it was not observed to be a perfect solution for making research more inclusive. There is certainly scope for improvement in several areas. For example, lessons were not always fully explained and shared, probably because the informal and rather self-directed learning process may have led to learning agendas and methods which suited only a specific sub-group of farmers. Moreover, the follow-up on learning experiences could have been more systematic and strategic. Nonetheless, reducing control from the research side and allowing a wider set of



stakeholders to engage and guide the research agenda and flow of learning was likely to have been conducive for aligning interdependent stakeholders. This will support the creation of a more co-operative and enabling institutional environment for the future uptake of technology.

Furthermore, activities planned for farmers should be consistent with the actual conditions experienced by the farmers and whether the farmers can afford to undertake such activities given their limited resources. In addition, for technological transfer to occur, the technology and equipment should be introduced at a time and in ways relevant to local situations. In this regard the role of the facilitator is vital; it is one of the most important factors enabling farmers to accept a new technology. However, the facilitator should appreciate the application of the new technology in the context of the field conditions being experienced by Myanmar farmers.

5. Implications for the Future

The LA facilitated farmers' learning about the quality of rice grain required by the market, so farmers could produce better quality grains according to these standards and could sell the product for a greater profit. The LA also built good communication and strong linkages between various stakeholders participating in the rice value chain. The good learning environment created by the LA will be reflected in the progress of future change and the basing of such change on experiences of what works and what doesn't.

This study has made recommendations to The Government of Myanmar, on public-private partnerships that would improve learning and adaptive capacity in the rice sector. The Government of Myanmar has also used technical assistance from IRRI for the development and implementation of the Myanmar Rice Sector Development Strategy (MRSDS), which was launched in May 2015. The MRSDS will serve as a guide for stakeholders to revitalize the country's rice sector and for Myanmar to regain its preeminent role in the global rice market. Thus, with the support of findings from this study, the LA approach can be used as one way to further the co-operation among different rice (or other) value chain stakeholders and to link smallholder farmers to the market.



6. References

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Appendix 1: Questionnaire used for individual interviews with stakeholders

ပူးပေါင်းပါဝင်သင်ယူခြင်းသုတေသန

အမည်		မြို့နယ်	
နေ့စွဲ		ကျေးရွာ/ အုပ်စု	

၁။ ပူးပေါင်းပါဝင်သင်ယူခြင်းအဖွဲ့တွင် သင်ပါဝင်လုပ်ဆောင်ခဲ့သည်မှာမည်မျှ ကြာပြီနည်း။ သင်ပါဝင်လုပ်ဆောင်ရသည့် အခန်းကဏ္ဍကိုဖော်ပြပါ။

၂။ ယခုကဲ့သို့ ပူးပေါင်းပါဝင်သင်ယူခြင်းအဖွဲ့၏ ရည်ရွယ်ချက်များမှာ သင့်သဘောထား အမြင်အနေနဲ့ မည်သည့် အရာများဖြစ်သည်ဟုထင်ပါသလဲ။

၃။ ပူးပေါင်းပါဝင်သင်ယူခြင်းအဖွဲ့သည် မည်ကဲ့သို့သောလုပ်ဆောင်ချက်များပြုလုပ်ခဲ့ပါ သလဲ။ မည်သူများပါဝင်လုပ်ဆောင်ခဲ့ပါသလဲ။

၄။ သင့်အနေနဲ့ ပူးပေါင်းပါဝင်သင်ယူခြင်းအဖွဲ့မှ မည်သည့်အရာများ မျှော်လင့်ထားပါသလဲ။ ၎င်းမျှော်လင့်ချက်များအမှန်တကယ် ရရှိခဲ့ပါသလား။

၅။ အခြားအဖွဲ့ဝင်တွေရဲ့ မျှော်လင့်ချက်တွေကရောဘာတွေဖြစ်နိုင်မယ်လို့ ထင်ပါသလဲ။ ၎င်းမျှော်လင့်ချက်များဘယ်လောက်အတိုင်းအတာအထိရရှိခဲ့သည်ဟုထင်ပါသလဲ။

၆။ သင့်အမြင်ရှုထောင့်အနေနဲ့ ပူးပေါင်းပါဝင်သင်ယူခြင်းအဖွဲ့၏ အကောင်းဆုံးနှင့် အသိသာဆုံးအကျိုးကျေးဇူးမှာမည်သည့်အရာဖြစ်ခဲ့ပါသနည်း။

၇။ ယေဘုယျအားဖြင့် အခြားအဖွဲ့ဝင်များတွေအတွက် အသိသာအထင်ရှားဆုံး အကျိုးသက်ရောက်မှုမှာမည်သည့်အရာဖြစ်သည်ဟုထင်ပါသလဲ။

၈။ ယခုကဲ့သို့ ပူးပေါင်းပါဝင်ဆောင်ရွက်သည့်အတွက် အဖွဲ့ဝင်များအနေဖြင့် မည်သည့်အကျိုးသက်ရောက်မှုများရရှိခဲ့ပါသလဲ။ ဥပမာအားဖြင့် ဗဟုသုတ၊ အဆက်အသွယ်။



စိတ်ကျေနပ်မှု၊ ပို၍အကျိုးရှိလာခြင်း၊ ငွေရေးကြေးရေးအကျိုးအမြတ်၊ ပိုမိုကောင်းမွန်
သောရလဒ်၊ အစရှိသည်။

၉။ သင်ယခုကဲ့သို့ ပူးပေါင်းပါဝင်ဆောင်ရွက်သည့်အတွက် ဆိုးကျိုးများရရှိခဲ့ပါသလား။ အကယ်၍ ရှိခဲ့
ပါလျှင် မည်သည့်အရာများဖြစ်ပါသနည်း။ နောက်တစ်ကြိမ် ပြုလုပ်မည်ဆိုလျှင် မည်ကဲ့သို့
ရှောင်ရှားရမည်နည်း။

၁၀။ ပူးပေါင်းပါဝင်ဆောင်ရွက်သည့်အတွက် အခြားအဖွဲ့ဝင်များတွင် ဆိုးကျိုးများရှိခဲ့သည် ဟုထင်ပါ
သလား။ အကယ်၍ ရှိခဲ့ပါလျှင် မည်သူများတွင် ရှိခဲ့ပြီးမည်သည့်အရာများ ဖြစ်ပါသနည်း။

၁၁။ ပူးပေါင်းပါဝင်သင်ယူခြင်းအဖွဲ့သည် အချိန်ကြာလာသည်နှင့်အမျှ ပြောင်းလဲမှုများ ရှိခဲ့ပါသလား။
ပြောင်းလဲမှုများရှိခဲ့ပါလျှင် မည်ကဲ့သို့ ပြောင်းလဲခဲ့ပါသနည်း။

၁၂။ နောက်ထပ်ပြုလုပ်မည့် ပူးပေါင်းပါဝင်သင်ယူခြင်းအဖွဲ့အတွက် ပုံစံနှင့်ဆောင်ရွက်ချက်
များရေးဆွဲရာတွင် တိုးတက်ကောင်းမွန်လာအောင် မည်ကဲ့သို့ပြုလုပ်ရမည်နည်း။

၁၃။ နောက်ထပ်ပြုလုပ်မည့် ပူးပေါင်းပါဝင်သင်ယူခြင်းအဖွဲ့အတွက် ပုံစံနှင့်ဆောင်ရွက်ချက်
များရေးဆွဲရာတွင် မည်သည့်အရာများရှောင်ရှားရမည်နည်း။

၁၄။ အခုပူးပေါင်းပါဝင်သင်ယူခြင်းအဖွဲ့တွင် ကူညီပံ့ပိုးသူအဖြစ် မည်သည့်အဖွဲ့အစည်း (သို့မဟုတ်)
မည်သူကအဓိကတာဝန်ယူဆောင်ရွက်ခဲ့ပါသလဲ။ ကူညီပံ့ပိုးသူမှ မည်သည့်
အရာများဆောင်ရွက်ခဲ့ပါသလဲ။

၁၅။ ပူးပေါင်းပါဝင်သင်ယူခြင်းအဖွဲ့ အကျိုးရှိစွာလုပ်ဆောင်လည်ပတ်နိုင်ရေးအတွက် ကူညီ
ပံ့ပိုးမှုအခန်းကဏ္ဍသည် သင့်အနေဖြင့် မည်ကဲ့သို့ အရေးပါသည်ဟုထင်ပါသနည်း။

၁၆။ ၎င်းအခန်းကဏ္ဍကိုကောင်းမွန်စွာမည်ကဲ့သို့ ဆောင်ရွက်ခဲ့ပါသလဲ။ သင့်၏အကဲဖြတ်
မှုကိုဥပမာဖြင့် ရှင်းပြပါ။



၁၇။ နောက်ထပ်ပြုလုပ်သည်အခါ ကူညီပံ့ပိုးမှုအခန်းကဏ္ဍကိုတိုးတက်ကောင်းမွန်လာအောင် မည်ကဲ့သို့ ပြုလုပ်ရမည်နည်း။

၁၈။ ပူးပေါင်းပါဝင်သင်ယူခြင်းအဖွဲ့၏ ဆောင်ရွက်ချက်များကြောင့် မည်သည့် တီတွင် ဆန်းသစ်မှုအသစ်အဆန်းများ (သတင်း၊ လုပ်ဆောင်ရမည့်နည်းလမ်း၊ လက်တွေ့များ၊ စီစဉ်ပြုလုပ်ခြင်းများ၊ အခြေအနေများ) ပေါ်ပေါက်ခဲ့ပါသနည်း။ တီတွင်ဆန်းသစ်မှု အသစ်အဆန်းများရှိခဲ့ပါလျှင် သင့်အတွက်မည်ကဲ့သို့ အကျိုးကျေးဇူး တန်ဖိုးတွေရရှိ စေပါသလဲ။

၁၉။ နောက်တစ်ကြိမ် ပူးပေါင်းပါဝင်သင်ယူခြင်းအဖွဲ့တွင် ပါဝင်ရန် အခွင့်အလမ်း ရရှိမည်ဆိုပါကသင် (သို့မဟုတ်) သင်၏အဖွဲ့အစည်းအနေဖြင့် ပါဝင်ဆောင်ရွက်သင့် ပါသလား။ ပါဝင်ဆောင်ရွက်သင့်ပါလျှင် အဘယ်ကြောင့်နည်း။ ပါဝင်ဆောင်ရွက်မှု မပြုလုပ်သင့်ပါလျှင် အဘယ်ကြောင့်နည်း။

၂၀။ နောက်ထပ်ပူးပေါင်းပါဝင်သင်ယူခြင်းအဖွဲ့နှင့် ပတ်သက်သည့် အကောင်းဆုံးအလား အလာနှင့် ပတ်သက်ပြီးမည့်သည့်အကြံဉာဏ်များပေးလိုပါသနည်း။



Appendix 2: Semi-structured interview questions used for focus group interviews

ပူးပေါင်းပါဝင်သင်ယူခြင်းသုတေသန

မြို့နယ်	
ကျေးရွာ/ အုပ်စု	
နေ့စွဲ	

၁။ ပူးပေါင်းပါဝင်သင်ယူခြင်းအဖွဲ့စတင်ခဲ့သည့်အချိန်ကိုဖော်ပြပါ။

.....

၂။ သင်တို့ ကျေးရွာအုပ်စု/ကျေးရွာကိုပူးပေါင်းပါဝင်သင်ယူခြင်းအဖွဲ့စတင်ရောက်ရှိခဲ့သည့် အချိန်ကိုဖော်ပြပါ။

.....

၃။ ပူးပေါင်းပါဝင်သင်ယူခြင်းအဖွဲ့သည် မည်ကဲ့သို့သော လုပ်ဆောင်ချက်များပြုလုပ်ခဲ့ ပါသလဲ။ မည်သူများပါဝင်လုပ်ဆောင်ခဲ့ပါသလဲ။

.....

၄။ သင့်တို့အနေနဲ့ ပူးပေါင်းပါဝင်သင်ယူခြင်းအဖွဲ့မှ မည်သည့်အရာများ မျှော်လင့်ထား ပါသလဲ။ ၎င်းမျှော်လင့်ချက်များအမှန်တကယ် ရရှိခဲ့ပါသလား။

.....

၅။ ယေဘုယျအားဖြင့် အခြားအဖွဲ့ဝင်များတွေအတွက် အသိသာအထင်ရှားဆုံးအကျိုးသက် ရောက်မှုမှာမည်သည့်အရာဖြစ်သည်ဟုထင်ပါသလဲ။

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၆။ ယခုကဲ့သို့ ပူးပေါင်းပါဝင်ဆောင်ရွက်သည့်အတွက် အဖွဲ့ဝင်များအနေဖြင့် မည်သည့် အကျိုးသက်ရောက်မှုများရရှိခဲ့ပါသလဲ။ ဥပမာအားဖြင့် ဗဟုသုတ၊ အဆက်အသွယ်၊ စိတ်ကျေနပ်မှု၊ ပို၍အကျိုးရှိလာခြင်း၊ ငွေရေးကြေးရေးအကျိုးအမြတ်၊ ပိုမိုကောင်းမွန် သောရလဒ်၊ အစရှိသည်။

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၇။ ပူးပေါင်းပါဝင်ဆောင်ရွက်သည့်အတွက် အခြားအဖွဲ့ဝင်များတွင် ဆိုးကျိုးများရှိခဲ့သည်ဟု ထင်ပါသလား။ အကယ်၍ ရှိခဲ့ပါလျှင် မည်သူများတွင် ရှိခဲ့ပြီးမည်သည့်အရာများ ဖြစ်ပါသနည်း။

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၈။ ပူးပေါင်းပါဝင်သင်ယူခြင်းအဖွဲ့သည် အချိန်ကြာလာသည်နှင့်အမျှ ပြောင်းလဲမှုများ ရှိခဲ့ပါသလား။
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များရေးဆွဲရာတွင် တိုးတက်ကောင်းမွန်လာအောင် မည်ကဲ့သို့ပြုလုပ်ရမည်နည်း။

၁၀။ နောက်ထပ်ပြုလုပ်မည့် ပူးပေါင်းပါဝင်သင်ယူခြင်းအဖွဲ့အတွက် ပုံစံနှင့်ဆောင်ရွက်ချက်
များရေးဆွဲရာတွင် မည်သည့်အရာများရှောင်ရှားရမည်နည်း။

၁၁။ အခုပူးပေါင်းပါဝင်သင်ယူခြင်းအဖွဲ့တွင် ကူညီပံ့ပိုးသူအဖြစ် မည်သည့်အဖွဲ့အစည်း (သို့မဟုတ်)
မည်သူကအဓိကတာဝန်ယူဆောင်ရွက်ခဲ့ပါသလဲ။ ကူညီပံ့ပိုးသူမှ မည်သည့်
အရာများဆောင်ရွက်ခဲ့ပါသလဲ။

၁၂။ ပူးပေါင်းပါဝင်သင်ယူခြင်းအဖွဲ့ အကျိုးရှိစွာလုပ်ဆောင်လည်ပတ်နိုင်ရေးအတွက် ကူညီ
ပံ့ပိုးမှုအခန်းကဏ္ဍသည် မည်ကဲ့သို့ အရေးပါသည်ဟုထင်ပါသနည်း။

၁၃။ နောက်ထပ်ပြုလုပ်သည်အခါ ကူညီပံ့ပိုးမှုအခန်းကဏ္ဍကိုတိုးတက်ကောင်းမွန်လာအောင်
မည်ကဲ့သို့ ပြုလုပ်ရမည်နည်း။

၁၄။ ပူးပေါင်းပါဝင်သင်ယူခြင်းအဖွဲ့၏ ဆောင်ရွက်ချက်များကြောင့် မည်သည့် တီတွင်
ဆန်းသစ်မှုအသစ်အဆန်းများ (သတင်း၊ လုပ်ဆောင်ရမည့်နည်းလမ်း၊ လက်တွေ့များ၊
စီစဉ်ပြုလုပ်ခြင်းများ၊ အခြေအနေများ) ပေါ်ပေါက်ခဲ့ပါသနည်း။ တီတွင်ဆန်းသစ်မှု
အသစ်အဆန်းများရှိခဲ့ပါလျှင် သင့်အတွက် မည်ကဲ့သို့ အကျိုးကျေးဇူး တန်ဖိုးတွေ ရရှိစေပါသလဲ။

၁၅။ နောက်တစ်ကြိမ် ပူးပေါင်းပါဝင်သင်ယူခြင်းအဖွဲ့တွင် ပါဝင်ရန် အခွင့်အလမ်း ရရှိမည်ဆိုပါကသင်
(သို့မဟုတ်) သင်၏အဖွဲ့အစည်းအနေဖြင့် ပါဝင်ဆောင်ရွက် သင့်ပါသလား။
ပါဝင်ဆောင်ရွက်သင့်ပါလျှင် အဘယ်ကြောင့်နည်း။ ပါဝင်ဆောင်ရွက်မှု မပြုလုပ်သင့်ပါလျှင်
အဘယ်ကြောင့်နည်း။



၁၆။ နောက်ထပ်ပူးပေါင်းပါဝင်သင်ယူခြင်းအဖွဲ့နှင့် ပတ်သက်သည့် အကောင်းဆုံးအလား အလာနှင့် ပတ်သက်ပြီးမည့်သည့်အကြံဉာဏ်များပေးလိုပါသည်။

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**THE CHARACTERISTICS OF MEMBERS OF
THE LIVESTOCK LEARNING ALLIANCE AND THE
SWOTS OF
THE LIVESTOCK LEARNING ALLIANCE**

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Abstract

The central dry zone in Myanmar covers large parts of the Magway, Mandalay and lower Sagaing Regions. The government is seeking to develop traditional to commercial goat and sheep farming and increase local investment and foreign direct investment in the livestock sector. Most households with land own draught cattle. For poorer and landless households, the raising of small ruminants and poultry provide an important source of income. Different alliance forms represent different approaches that partner firms adopt to control their dependence on the alliance and on other partners. NGOs have been launching the development projects for livestock sector in central dry zone, Myanmar. Most learning alliance participants were prepared on the basis of their experience for the development of smallholder livestock systems, a commitment to working with smallholder farmers, enthusiasm for linking with a research project, and a willingness to contribute their own resources to participate in the learning alliance. LA members should be encouraged to evaluate and adapt technologies to their needs according to their own ideas, methods, and economic possibilities. Farmers can express the problems that they perceive to be relevant. LA approach was useful in building bridges between farmers, researchers and NGO staff of livestock farming. Additionally, to accept a new introduced technology by the farmers, the role of NGO staff, LBVD staff and UVS staff are one of the most important things.

Key words: central dry zone, livestock, learning alliance, researchers, Myanmar



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1. Introduction

1.1 Background

The Central Dry Zone of Myanmar covers large parts of the Magway, Mandalay and lower Sagaing Regions, including 58 townships. The Central Dry Zone (CDZ) covers about 13 percent of Myanmar's total area and has a population of roughly 14.5 million, close to a third of the country's population. Typical households contain five to seven people and the land is densely populated (JICA, 2010).

The Myanmar Government is seeking to develop and commercialize traditional goat and sheep enterprises, and increase local and foreign investment in the livestock sector. The Government has also prioritized the creation of water points in the dry zone, increasing fodder production and promoting dry fodder processing techniques. There are also plans for the Government to expand its pool of veterinary health workers to control animal diseases such as avian influenza and improve the provision of vaccines.

Humanitarian and aid organizations also have the expertise to promote dry fodder processing techniques and assist with vaccination programmes, as well as introduce new dairy processing and dry meat processing techniques. Furthermore, humanitarian organizations are seeking to link the livestock industry with public companies and private firms.

Livestock play a crucial role in household food security as these animals provide a source of income and nutrition as well as being a key asset, especially during times of extreme crisis. Livestock commonly kept by households in the CDZ include cattle, poultry, goats, sheep and pigs (WFP, 2009). Most households with land own draught cattle. For poorer and landless households, the raising of small ruminants and poultry provides an important source of income. Little access to animal health services and low fodder availability lead to high animal losses from disease, and increase the risk of overgrazing the grasslands of the common land. Indeed, the value of the common land for livestock is decreasing, as animal owners strive to increase the numbers of animals to maximise production from the limited fodder base available.

This overuse of grazing lands increases the risk of ongoing environmental degradation, with the impact from shocks (e.g. due to weather events, poor markets) accentuated by the sometimes oversized herds and resulting in significant losses. However,



the development of improved pastures requires tenure security and more advanced knowledge of animal nutrition, both of which need fostering.

Farmers in the CDZ generally rear livestock such as cattle, goats and pigs, while poultry are uncommon. Grazing land, grazing patterns and ruminant nutrition are important subjects for these farmers. So, to assist with the development of ideas and implementation of better livestock management practices in Myanmar's CDZ, a Livestock Learning Alliance (LLA) has been meeting at various locations twice a year since 2015. This LLA involves a range of stakeholders including extension officers and staff from government organizations and NGOs, as well as participants from the private sector, and provides a 'platform' for identifying knowledge gaps, sharing new livestock management techniques and scientific findings, and exchanging experiences about successes and failures of trials or research and development projects. During the LLA meetings, each stakeholder can share experiences, information and new findings which could be or have proven to be valuable for livestock farmers. Most presentations to date have concerned ruminants and pastures, and ways of managing livestock systems on the farms in rural areas.

1.2 Rationale of the study

A strategic alliance involves at least two partner organizations or groups of stakeholders, that: (1) remain legally independent after the alliance is formed; (2) share benefits and managerial control over the performance of assigned tasks; and (3) make continuing contributions in one or more strategic areas, such as technology or products (Yoshino and Rangan, 1995). These three criteria imply that strategic alliances create interdependence between autonomous economic units, bringing new benefits to the partners in the form of intangible assets, and obligating them to make continuing contributions to their partnership. Different alliance forms represent different approaches that partner organizations or stakeholders adopt to control their dependence on the alliance and other partners. Different forms for strategic alliances may be due to their different legal forms, which enable partners or stakeholders to control the allocation of resources and distribution of benefits among the partners (Knoke, 2001). In general, the activities of inter-organizational strategic alliances focus either on an in-depth analysis of a selected narrow issue, such as the effect of knowledge ambiguity on technological knowledge transfer in strategic alliances (Simonin, 1999).



NGOs have been facilitating development projects for the livestock sector in the CDZ of Myanmar and, as mentioned above, a LLA has been one of the approaches used to encourage change. Most of the participants were chosen for the CDZ LLA because of their involvement and experience with the livestock systems of the CDZ; commitment to working with small holder farmers; enthusiasm for linking with are search project; and willingness to contribute their own resources to participate in the learning alliance.

This research investigates the formation, operation and effectiveness of this regional scale learning alliance for livestock, and the activities of and outcomes for the stakeholders wishing to enhance various aspects of small holder livelihoods. This study aimed to analyse the opportunities for knowledge sharing, innovation, co-learning and capacity building for the participating stakeholder groups.

1.3 Objectives of the study

This research study was conducted with the following objectives:

1. to identify stakeholders' expectations, needs, and incentives for participation;
2. to analyse the institution-building process;
3. to observe opportunities for co-learning and capacity development;
4. to investigate a Regional Learning Alliance (RLA) innovation process; and
5. to assess lessons learned, to provide for further RLA development.

2. Method and Design

2.1 Description of the Project Area

The study areas were Ye Nan Chaung Township (Magway Region) and Meikhtila Township (Mandalay Region), located in the Central Dry Zone (CDZ) of Myanmar. The CDZ is usually defined to include the majority of three regions (Magway, Mandalay and Sagaing) occupying the centre of Myanmar. This zone is strongly influenced by its climate: average annual rainfall (960mm) is moderate but is lower than in other areas of the country and concentrated in the May-October period, with a dry period often occurring during June or July. The lengthy period without precipitation, relatively high average temperatures and generally light shallow soils result in semi-arid conditions restricting agricultural potential in the absence of irrigation. Even where ground water is available, salinity levels may restrict its utilization.



The population density of people in the CDZ, where the average family size is 4.9 persons, is above the national average. Although over forty percent of the rural population are landless, relatively little non-agricultural activity takes place in rural areas within the CDZ and supplementary off-farm income is generally obtained from labour migration (seasonal and long term). According to the 2010 Agricultural Census (REF?), about thirty percent of all agricultural households in Magway and Mandalay Regions had members working outside agriculture, and approximately fifteen percent of all agricultural households were led by females.

The Central Dry Zone is an important livestock production area with a high density of cattle, sheep and goats. It is also one of the poorest regions in Myanmar. The 10 million people who live there depend mostly on dry-land agriculture. Most farms are smaller than 2 hectares, and there are many landless people whose livelihood depends on supplying farm labour. Rainfall is low and highly variable, and there is a high risk of crop failure. Farming systems are diversified and livestock is important for food, cash income and livelihood security. Most households, including the landless, keep poultry. Landless people and smallholder farmers raise small ruminants, and most farmers raise cattle (ACIAR, 2017).

2.2 Data collection

Data were collected from staff of non-government and government organizations involved as stakeholders in the CDZ's regional Livestock Learning Alliance (LLA) group. The stakeholder organisations included the staff from the NGOs Maefahlong, Cesvi, Thadar Consortium and the Adventist Development and Relief Agency (ADRA); the United Nations Development Program (UNDP); the University of Veterinary Science (UVS); and the Livestock Breeding and Veterinary Department (LBVD). Two rounds of individual interviews with personnel from the different stakeholder organizations were conducted at LLA meetings, using a prepared questionnaire (see Appendix 1). The first round of interviews was at the LLA meeting at Ye Nan Chaung Township in June 2015 and the second at Meikhtila in July 2016. The questionnaires for stakeholders were prepared to ascertain stakeholders' perceptions of the objectives and incentives of the LLA. Stakeholders were also questioned regarding the strengths, problems, constraints and negative aspects the LLA.



2.2.1 Sample size

A total of twenty interviews across seven stakeholder organizations involved in the LLA were conducted across both rounds of interviews, as shown in Table 1. Ten representatives from five stakeholder organizations were interviewed in 2015 and ten representatives from six organizations were interviewed in 2016, with staff from four organizations being interviewed both times.

Table 1 Summary of numbers of people interviewed, and the stakeholder organizations they represented in the Livestock Learning Alliance of the CDZ, Myanmar

Stakeholder	Number of People		Total
	2015Interview	2016Interview	
Maefahlong staff	3	2	5
Cesvi staff	2	2	4
Thadar consortium staff	2	-	2
ADRA	-	2	2
UNDP	-	1	1
Teaching staff (UVS)	2	2	4
Township officer (LBVD)	1	1	2
Total	10	10	20

2.2.2 Analytical Procedure

A Stakeholder Analysis was performed using the responses of interviewees from the different stakeholder organisations associated with the LLA, by:

1. listing all names of stakeholders including individuals, groups and institutions, who had any involvement in the LLA;
2. conducting a scoping exercise by categorizing the stakeholders, on the basis of their objectives, roles and activities, problems and needs, and then dividing them into groups such as beneficiaries, implementers, decision-makers, funding agencies, collaborators, potential opponents, and disadvantaged participants; and
3. conducting a focused analysis across the stakeholders to determine the LLA's Strengths, Weaknesses, Opportunities and Threats.



Table 2 Scoping exercise of stakeholder analysis

Items	Stakeholder groups	Objective of stakeholders	Role and activity of stakeholders	Returns from participation on LA groups	Noticeable improvements
Non-Government Organizations	<ul style="list-style-type: none"> - Maefahlong staff - Cesvi staff - Thadar consortium staff - ADRA - UNDP 	<ul style="list-style-type: none"> - To improve their knowledge and experiences - To gain more problem- solving methods in their fields - To contribute the knowledge and experiences to their client groups - To improve the current production practices - To develop the livestock sector by coordinating from different points of views 	<ul style="list-style-type: none"> - Distribute the good quality animal breeds - Solve the problems and suggest the best solutions - Training and sharing knowledge to the livestock farmers - Explain and provide the advanced technologies to the livestock famers - Collaborate the other NGO staff and share knowledge and experiences 	<ul style="list-style-type: none"> - Technology for systematic usage of good quality animal breeds - Technologies and knowledge - Comprehend how to perform a research trial 	<ul style="list-style-type: none"> - Using the good quality animal breeds - More systematic on livestock production practices - Awareness on the quality of animal breeds especially goats - Awareness on the importance of pasture for ruminant production
Government Organizations	<p>Teaching staff (UVS)</p> <hr/> <p>Township officers (LBVD)</p>	<ul style="list-style-type: none"> - To share knowledge and experiences through research <hr/> <ul style="list-style-type: none"> - To gain more benefits for the livestock farmers through collaboration 	<ul style="list-style-type: none"> - Share the research knowledge and experiences to LA members - Give the best solutions to LA members who have the problems in fields - Explain and provide the advanced technologies to the livestock famers - Provide livestock systems and veterinary care 	<ul style="list-style-type: none"> - Understanding about the LA group and its function 	<ul style="list-style-type: none"> - Building the mutual trust with the LA members - Achieve more better livestock production technologies - Understand that cooperation can create better environment and conditions



3. Research Findings

3.1 The Scoping Exercise

Table 2 summarises the objectives, roles, activities and benefits from participating in the LLA for each of the stakeholder groups. Most stakeholders were participating in the LLA to improve their knowledge, skills and understandings associated with more efficient and productive approaches to livestock management, and to be able to extend these improvements to their client groups.

3.2 Focused Analysis

Overall, the focused analysis of the strengths, weaknesses, opportunities and threats of the LLA revealed that this alliance provided many benefits but that it could be better administered, and the variety of activities could be increased and made more relevant for practical production settings. Additional stakeholders could be included, or LLAs established with different interests or target industries, so that benefits could be spread directly to a greater range of interested organizations and individuals. A number of identified threats provide challenges which the LLA could take up to improve long term outcomes for agricultural extension and rural development.

The specific strengths, weaknesses, opportunities and threats recorded from individual interviews are listed below.

3.2.1 Strengths

- (i) There was sharing of knowledge and experiences among different organizations.
- (ii) All members contributed knowledge and experiences from their fields of expertise.
- (iii) Everyone took advice from other organizations or participants if he/she had a problem.
- (iv) Members could gain knowledge and skills to avoid limitations experienced by other organizations when accounts of such experiences were presented at LLA meetings.
- (v) There were good relationships among LLA members.
- (vi) Many research and field experiences were and could be shared.



3.2.2 Weaknesses

- (i) Implementation of each LLA meeting was delayed.
- (ii) It is difficult to find an organization to host and fund LLA meetings.
- (iii) Inviting LLA members from different organizations was not always easy.
- (iv) The topic for each LLA meeting was too narrow in scope.
- (v) Other potential stakeholders, not immediately involved in the topic to be discussed, were not invited.
- (vi) If fewer organizations were invited then fewer organizations had access to more knowledge.
- (vii) Two days for a meeting was not enough.
- (viii) Field trips to livestock farms, pastures and other project areas were also not enough.
- (ix) NGO staffs invited were not the same for each of the first and second meetings, so it was impossible to evaluate the consequences of their involvement.

3.2.3. Opportunities

- (i) Many organizations such as NGOs, livestock feed companies and private farmers are interested in the LLA meetings.
- (ii) Pig and ruminant (especially goat) farming by rural people in CDZ are potential subjects for the LLA.
- (iii) Many grazing lands for livestock production are available in the CDZ for the attention of the LLA.
- (iv) Many NGO projects are available in CDZ for the attention of the LLA.
- (v) UVS and LBVD researchers are interested in ruminant production and pastures.

3.2.4 Threats

- (i) Host organizations for LLA meetings are difficult to find.
- (ii) Pure animal breeds are not readily available.
- (iii) Pastures, for ruminant feed, are not available for the whole season because of decreasing rainfall overall, or little rain in certain months of the year.
- (iv) Rural people cannot sustain their new or changed approaches to farming after development projects finish.



3.3 Influential stakeholder groups within the LLA

Among the LLA member groups, the UVS teaching staffs are particularly influential, because of their access to research facilities and outcomes, and demonstration farms. Due to its government mandate, the LBVD has strong linkages with NGOs, farmers and the private sector. It thus has an influential role, both within and outside the LLA. The LBVD officer can recommend livestock systems and veterinary services, and vaccine use and feed formulation are integral to interactions of the LBVD officer with NGOs and farmers.

The local NGO project staffs provide another link between farmers and researchers. These staff administers and summarizes research projects and data, and connects research findings with practices of farmers. These project staff also promotes recommended technologies to farmers and link farmers with other groups of researchers and LLA member organisations.

4. Conclusions

Farmers have been developing livestock practices and innovations without the contributions of modern science and formal research institutions. LA members should be encouraged to evaluate and adapt technologies to their needs according to their own ideas, methods, and economic possibilities. Farmers can express the problems that they perceive to be relevant.

Moreover, it is difficult for professional researchers to know farmers' preferences and to understand the complexity of their situations. Farmers also have an advantage in disseminating livestock innovation. The most successful researcher-developed technologies were those that the key stake holders modified the most. Therefore, a co-development model is needed in which the key stakeholders and formal researchers construct a technology together, particularly in the adaptation phase LA approach was useful in building bridges between farmers, researchers and NGO staff of livestock farming. There certainly remains scope for improvement in several areas. The greater autonomy and informality of the learning process implied that lessons were not always explicated and shared, and may well have led to learning agenda that fit only a specific segment of farmers. Moreover, the follow up on learning experiences could probably be more systematic and strategic.

In the consideration of technological transfer, the introduced technology should be on time and reliable with local situations. Additionally, to accept a new introduced technology



by the farmers, the role of NGO staff, LBVD staff and UVS staff are one of the most important things. They should also realize the application of the technology in the actual field conditions of livestock farmers.

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Appendix 1 The questionnaire used for individual interviews of livestock learning alliance members in June 2015 and 2016

1. In your opinion, what are the objectives of the learning alliance?
2. What types of activities have happened so far in the learning alliance?
3. What types of activities should the learning alliance undertake in the future?
4. What are your expectations of the LA? To what extent are these expectations being met? What could be done by the learning alliance to better meet your expectations?
5. What do you think are the expectations that other stakeholders have of the LA? To what extent do you think that these expectations are being met? What could be done by the learning alliance to better meet their expectations?
6. From your perspective, so far, what is most significant positive impact from the learning alliance?
7. More generally, for other stakeholders, what do you believe is the most significant positive impact from learning alliance?
8. What are stakeholders gaining from their participation? e.g. knowledge, contacts, satisfaction, increased effectiveness, financial benefits, better outcomes etc.
9. What is the most important thing that you think stakeholders could gain from their participation?
10. Are there any significant disadvantages in participation for you? If so, what are the disadvantages? How could these disadvantages be avoided?
11. In your opinion, are there any significant disadvantages in participation for other stakeholders? If so, what are these disadvantages?
12. Which organisation or individual played the role of LA facilitator?
13. In your opinion how important is this facilitation role to the effective functioning of the learning alliance?
14. How well was this role played? Please give reasons for your assessment.
15. How could the facilitation role be improved next time?
16. Has the learning alliance change over time? If so, how did it change?
17. Did any innovations come from the learning alliance? If so, what? (*Prompts: social engagement, economic, technological, behavioural, institutional?*)
18. What value, if any, was/were this/these innovation/s to you?
19. What improvements could be made to the design and function of this learning alliance?
20. What should be avoided in the design and function of this learning alliance?
21. Would you or your organisation participate in a new learning alliance if the opportunity to do so was offered? If so, why? If not, why not?
22. What suggestions do you have regarding the potential focus of a new learning alliance?



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