

Lessons learned from livelihoods interventions in the dry zone of Myanmar

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Separate annex: Access to water for consumption and agriculture purpose (including micro irrigation)

0. INTRODUCTION

- **Objective**

The objective of this desk review is to draw lessons, both positive and negative, from available documentation of a selection of rural development initiatives that have been conducted in the Central Dry Zone (CDZ) of Myanmar. For that purpose, the reviewer was tasked with identifying lessons learned, including but not limited to, the following thematic areas: Community development approaches; Community and farmer organisation; Social protection; Agriculture extension; Farmer-Field-Schools and other extension tools; Crop diversification; legume production; higher value commodities; Access to inputs: fertilizer, pesticides, seeds; Access to water for consumption and agriculture purpose including micro-irrigation; Water and soil conservation/reforestation; Livestock management, pasture improvement, animal health services; Agriculture & livestock production marketing; Vocational training; Cash-for-work

- **Limitations**

Many of the evaluation and progress reports, which form the basis this report focus on documenting the extent to which expected results have been achieved or not achieved with limited analysis of *why* certain interventions were particularly successful or less successful. Report recommendations tend to focus on adjustments to the project components rather than overall recommendations relevant for purposes of informing other interventions in the area/sector, alternative approaches, and the potential for multiplication and scaling up. Almost all the available reports have been produced by the end of two to three year long projects, which is a relatively short frame to capture lessons learned in relation to sustained change in practice and long-term impacts of livelihoods-related interventions. Moreover, in many cases the lessons learned that can be identified from projects are quite different – several are contradictory – which reduces the extent to which lessons learned can be deemed relevant for the area in more general terms. A few detailed in-depth studies of farming systems in the CDZ provide solid background information as well as outline suggested interventions useful to guide programme formulation.^{1,2} However, they do not include evaluations or reviews of prior programme implementation in the area and hence provides limited concrete lessons learned based on actual interventions in the CDZ specifically. For some sub-themes only a limited number of reports are available limiting the overall level of generalization. On the issue of gender, very few lessons learned were available apart from a few vocational training programmes with mixed success - and a more detailed research projects stressing that gender inequality in the distribution of income in the rural dry zone is substantial with female headed households having lower average per capita income, fewer livelihood resources and higher rates of landlessness.³

All that said the Consultant is of the opinion that this review report provides a valid and representative overview of the documented lessons learned from livelihoods interventions in the CDZ – based on the material made available by LIFT.

- **Summary conclusions**

Overall, relatively few interventions have been successful in improving livelihoods in the Dry Zone area in a comprehensive manner. Lessons learned show that constraints such as low productivity, limited access to inputs and market access combined with low soil fertility are difficult to overcome at both a localised and larger scale in the Dry Zone. However, some positive lessons learn include the establishment of revolving funds, live stock production and community development approaches. The need for improved seed varieties (particular in response to increasing droughts) and measures to improve access to irrigation and water and soil conservation stand out as priorities from the material under review. A summary (in bullet form) of lessons learned for each thematic area is included within each thematic section.

¹ Cools, J. W. F. 1995.

² Kahan, David. 2001.

³ Kyaw, D. and Routray, J. K. 2006.

1. Community development approaches

Community Development (CD) is an approach that gives control over planning decisions and investment resources of development projects to local communities, often at the village level. As of end 2012, six LIFT partners implement projects in the Dry Zone using a community development approach⁴ (including ADRA, Save the Children in Myanmar, GRET, WHH, CESVI and others). The results are generally successful – and often key to the overall success and sustainability of project interventions - but there is scope for improvements and up-scale. (Note: Lesson learned relevant particularly to community groups and farmer organisations are included in the following section.)

Lessons learned

- *The experience and skill of village-level facilitators is a key success factor in community development but many NGOs rely on young and inexperienced staff with only superficial training in community mobilisation and facilitation activities.*
- *A broad portfolio of activities implemented by many IPs results in that village-level staff often feel overwhelmed.*
- *IPs have developed, and are using, some interesting participatory planning tools, which may provide examples for wider scale up. These include successful introduction of “Participatory Monitoring and Evaluation” (village-level monitoring), which is generating interesting results that enhance community ownership and need to be fed back into project learning.⁵*
- *Some CBOs have been able to link to government service providers including become active participants at the monthly township-level coordination meetings and are in general able to represent their interests when dealing with government service providers. Institutional linkage of activities to government line ministries also functions as a good exit strategy (where government service providers are able to provide support, which in many cases is limited).⁶*
- *There are many good examples of inclusive community development such as the growth of SHGs’ revolving funds and in-kind livelihoods revolving systems, which tend to be well managed with members saving regularly, accessing new loans/in-kind support, repaying loans in a timely fashion and multiplying the potential impact of the interventions.⁷ In some cases SHG members added their own donations allowing for new members to take loans – and in other cases SHGs played a specific role in empowering women.*

2. Community and farmer organization

A key component of community development approaches amongst most IPs in the Dry-Zone is to promote village-based community livelihood groups and in some cases farmer networks that may have the potential to grow into farmer organisations over time (something that has been absent in Myanmar for several decades due to the former military government’s restrictions of many forms of mass-organising). Most community groups are singularly focused on individual villages but increasingly IPs are seeking to link them with each other through exchange visits, joint capacity building trainings and learning networks. *Most reports point to the key importance of the community and farmer groups in terms of sustainability and learning* but have yet to explore their potential to enhance bargaining power by producers vis-à-vis middle men or buyers. Few of the IPs (SCiM, WHH, ADRA, GRET etc.) provide any nuanced analysis on the power dynamics of these local groups (role of women versus men, poorer segments versus more well-off community members, possible elite capture or positive aspects of the involvement of resourceful members of the community) or the relationship between these newly-established groups and traditional village organising and power structures. That said, overall community organising in groups or organisations has been key to higher levels of mobilization, participation and sustainability but focused investment in these structures over time is a key requirement.

⁴ LIFT. 2013.

⁵ Dr. Ko Ko Zaw, U Khin Maung Tun and Salai Khin Maung Aye (Save the Children). 2012.

⁶ Sereyath, Park (GRET). 2013, p. 8.

⁷ LIFT. 2013, p. 41.

Lessons learned

- *The strength of the CBOs (active, well-functioning, high standards of transparency and accountability, and properly managing their initiatives) is in no insignificant part attributable to proper project entry and exit strategies.*⁸
- *Three key factors are a pre-requisite to setting up a successful community livelihoods network: Strong leadership, successful development and implementation of livelihood intervention, and provision of a comprehensive training package (e.g. management plan, leadership skills etc.)*⁹
- *Time, duration of the intervention and continuous support are crucial factors to ensure the smooth development and strengthening of community livelihoods networks.* Additional trainings in community's management and fund raising should be added to the already existing package of training provided to increase self-reliance and sustainability.¹⁰
- *Farmer Extension Groups is a strategic activity toward a building up of strong and functional local farmer organisation in the future, which at its earlier stages allows a good network to develop within and among villages in sharing knowledge and experiences in agricultural production.*¹¹
- *The full potential of village CBOs' role in economic generation activities is not fully exploited.* Consideration should be given towards fully exploiting the potential community based bargaining power in acquiring necessary inputs (seeds, fertilisers credit, etc.) through the potential of economics of scale. This in turn could lead to a broader, joint effort of cooperation in some regions.¹²
- *A future project component could promote community-based bargaining power through support to a Rural Market and Farmers' Initiative.* Consideration should be given to what extend this could be a program wide cadre of trainers supporting farmers as well as saving and credit groups on marketing, business development and group purchasing, as well as business identification planning and management.¹³
- *Water User Groups is potential for being an active and leading community based organisation in the future.* The project should provide further in the field of organisational and financial management but also refresh training on technical aspect, especially on maintenance and improvement of water supply infrastructure.¹⁴

Civil society strengthening (generally, not Dry-Zone specific):

- *A number of important challenges with respect to civil society strengthening are emerging. In some organisations only staff members working on LIFT-funded activities tend to be trained (with LIFT resources) on LIFT requirements (financial systems, reporting, monitoring and reporting formats) – rather than focusing on capacity development of the organization as a whole.* Moreover, many organisations report that skilled trainers are hard to find, and that some of their training was poorly delivered.¹⁵

Other: Several report stressed successful coordination with local and government stakeholders in the Dry Zone as an important lesson learned:

- *A key factor to successful project implementation and achievements, ownership and project sensitization with stakeholders at many levels including local authorities, line ministries and local communities throughout the project cycle.*^{16, 17, 18, 19}

⁸ Dr. Ko Ko Zaw, U Khin Maung Tun and Salai Khin Maung Aye (Save the Children). 2012.

⁹ Save the Children. 2012.

¹⁰ Save the Children. 2012.

¹¹ Sereyvath, Park (GRET). 2013, p. 11

¹² Mekong Economics Ltd.. (LIFT). 2013.

¹³ Mekong Economics Ltd.. (LIFT). 2013.

¹⁴ Sereyvath, Park (GRET). 2013, p. 5

¹⁵ LIFT. 2013, p.8

¹⁶ Thar Tun Oo, Dr. Thaug Htay and Salai Khin Maung Aye. (ADRA) 2010, p. 9

¹⁷ Dr. Ko Ko Zaw, U Khin Maung Tun and Salai Khin Maung Aye (Save the Children). 2012, p. 3

3. Social protection

Social protection refers to a set of *benefits* to provide *security* against socially recognised *vulnerability* or deprivation conditions. The available material provides very limited information about social protection measures designed and implemented by IPs in the Dry-Zone. Although poor and vulnerable households are frequently targeted within projects, the interventions are rarely conceptualized in a social protection framework nor do reports evaluate the results in terms of improvements in the ability of vulnerable groups to withstand shocks. Interventions that could be defined as social assistance (as part of social protection) include Cash for Work, conditional cash transfers, provisions of farm implements and livestock to vulnerable families (often functioning as a ‘safety net’ in case of unexpected household shocks (health incidents, loss of income and the like) and Self Help Groups (SHGs) – to the extent they include the vulnerable (who do not always have the means to be able to set funds aside).

Lessons learned from these interventions are included elsewhere in the report under the specific thematic topics and only mentioned below if specific references to social protection (Save the Children) – and are thus not comprehensive nor can they be generalised. Overall, several agencies found that the options for improving the situation of poor farmers and landless poor are very limited.²⁰

The lessons learned from the LIFT mid-term review (draft)²¹ are country and not dry-zone specific.

- *Farm implement distribution was effective in terms of increasing casual labour days* by about 5 days a month compared to before the project (where casual labours had to pass up work opportunities due to a lack of implements).²²
- *Cash transfer and livelihoods activities showed tangible immediate impacts*, which fulfilled the poorest households’ needs and improved children’s health.²³
- *As the programme progressed there was greater acceptance of the use of cash as a social protection scheme* to support mothers – and concerns that mothers would only attend educational activities to receive money, were dispelled.²⁴
- *SHGs use the credits from the revolving funds mainly for business purposes followed by private needs* (education of children, health and agricultural inputs).²⁵

LIFT mid-term review 2013 (draft):

- *Inadequacies of conceptualising cash-for-work (CfW) as a developmental, social protection mechanism was apparent*: CfW beneficiaries not always the most vulnerable; sometimes CfW is the only involvement casual labours have in the project; CfW not always used in tandem with other development approaches; almost all beneficiaries interviewed used their “extra” CfW-generated income for daily needs such as food and school fees (almost none reporting longer-term investment).
- *Asset transfer (most commonly in the form of livestock) did not target the most vulnerable*.

4. Agriculture extension: Farmer-Field-Schools and other extension tools

Numerous IPs are providing trainings and demonstration of new technologies through participatory Farmers Field Schools (FFS) and related extension tools. The FFS generally focus on changing farmers’ practices through

¹⁸ Matienzo, Rodolfo M. (CESVI). 2011, p.38

¹⁹ Mekong Economics Ltd. 2013.

²⁰ Martins, Dr. Christine and Aye Aye Khaing. 2013 (WHH), p.35

²¹ Mekong Economics Ltd.. 2013.

²² Dr. Ko Ko Zaw, U Khin Maung Tun and Salai Khin Maung Aye (Save the Children). 2012, p. 4

²³ Dr. Ko Ko Zaw, U Khin Maung Tun and Salai Khin Maung Aye (Save the Children). 2012, p. 4

²⁴ Save the Children. 2012.

²⁵ Welthunger Hilfe (WHH). 2012, p. 17

an evidence-based learning process, practical field experience and technical discussions. Key topics include intensifying and diversifying production, improving soil management, seed selection and production, as well as crop management, integrated pest management and fertilizer usage (including green manure).

While FFS models have proven relatively successful in the Delta and in the Hilly Region with high adoption rates, the experiences from the dry-zone are more mixed with some farmers slow or resistant to adopt the new technologies – as they want to see evidence that the new methods are successful. LIFT partners involved in FFS in the Dry-Zone include GRET, WHH, Save the Children, ACIAR and others. Some but not all of these partners have undertaken FFS work in cooperation with local and national government staff – with very mixed results. Although government extension workers tend to be interested in participating, it is often difficult to integrate these lessons learned into their own work due to time and financial restraints for carrying out extension services with farmers in the first place. Government extension work tends to be heavily under-resourced and top-down in approach.^{26, 27, 28}

The LIFT mid-term review concludes that overall, *the most common underlying determinant of (non)adoption of new technologies is risk*. This is a general issue across the country but particularly pertinent for the Dry Zone area. With little buffer to mitigate against potential failure, the beneficiaries are unable and/or unwilling to adopt new technologies if there is any risk that they might end up worse off than usual, as they have very limited capacities to cope with shocks.

It is important to emphasize that *many of the FFS-focused projects are often not implemented long enough to convince beneficiaries of new approaches. Hence it is suggested that three to five years of demonstration is used at a minimum.*²⁹

Lessons learned

- *The most common underlying determinant of (non)adoption of new technologies is risk as farmers have little buffer to mitigate against potential failure.*
- *FFS-focused projects are not implemented long enough to convince beneficiaries of new approaches – projects should be extended to 3-5 years as a minimum.*
- *Although most projects can demonstrate part adaptation of new technologies learned through farmer field schools acceptance by the community of other new appropriate technology – particularly organic fertiliser, pesticide and toddy stoves – is a slow process and in many cases without wider application in the communities.*³⁰
- *Most of the graduated FFS and FEG members could manage their farms with a more effective ways and could increase agricultural yield from around 30% to 50% and could generate new quality seed leading to generate more income from selling their agricultural products as both food products but also as seed.*³¹
- *For agricultural development, based on concrete results obtained, interventions should focus on extension work through facilitating more meetings and exchanges amongst farmers who already successfully applied innovations and other farmers.*
- *In order to keep seed quality and purity for a longer time, there is a need to introduce techniques that are specific for seed production and storage; if not to all farmers, at least to some key local farmers who are interested in seed multiplication and distribution.*³²
- *It takes long time to see clearly the results of soil conservation and fertility improvement activities – although they are important for the dry zone where soil are more and more degraded.*

²⁶ Kempel, Susanne. 2013.

²⁷ JICA. 2010a, p. 6-36, 6-37

²⁸ Cools, J. W. F. 1995, p. A1-53

²⁹ Mekong Economics Ltd.. (LIFT). 2013.

³⁰ Dr. Ko Ko Zaw, U Khin Maung Tun and Salai Khin Maung Aye (Save the Children). 2012, p. 27

³¹ Sereyvath, Park (GRET). 2013, p. 3

³² Sereyvath, Park (GRET). 2013, p. 5

- For future FFS, one project concludes that it should try new strategy by *adapting intensive and internship training within an agricultural centre (can be public or private) where practical farms and other facilities are available for participants to do practical work properly.*³³
- *Interventions could develop a strategic plan to make use of graduated FFS supported by the project to become key actors of farmer-to-farmer extension.*³⁴
- While new crop varieties and improved cultural practices allow farmers (who have conducted farm demonstration) to increase yield from 30% up to 150% (and sell much of this as seeds at a higher price than as food products), *the performance is relatively low for those who only apply a few new practices (GRET: 25)*
- *In some cases gradual improvements of farming techniques is not viable as the essential problem is the sustainability of the agricultural production system in the area as such.*³⁵
- *Compost making has been largely unsuccessful as few farmers continue the activity after the end of the project citing cost, time consumption and labour intensity.*^{36, 37}

5. Crop diversification, legume production, higher value commodities

In Myanmar, pulses and oilseed legumes are the second most important group of crops after rice. In the Dry Zone these are particularly important crops due to the soil, water and weather conditions in the area. The area produces almost the entire nation's pigeon pea and chickpea crops and about 70% of its groundnut. Average yields of the legume crops remain low for a number of reasons due to lack of irrigation, low-yielding seeds, limited access to high quality seeds, poor soil conditions, crop management practices, management of biotic and anti-biotic stresses, and lack of or sub-optimal application of fertilizers. In addition lack of market access and capital also placed limitations on overall productivity/prices.³⁸

Agencies have struggled to address these issues while also faced significant obstacles in identifying and introducing crop diversification and higher value commodities (such as peanuts, potatoes, dried onions, dehydrated onions etc.) Welthunger Hilfe (WHH)^{39, 40}, Cesvi⁴¹, EcoDev⁴² and ACIAR⁴³ have been particularly engaged in this area. While ACIAR, which is mainly research-focused, has developed and tested promising higher yielding and hybrid strains of legumes in cooperation with government agencies, little information is provided on barriers to adaption among farmers, (projected) rates of adaption post-project and hence the overall sustainability of the suggested new/improved strains of legumes. Additional lessons learned from the ACIAR project are included in section 6 (on issues such as fertilizer, seed banks and inoculants). WHH and Cesvi projects have failed to identify commercially viable new crops despite agronomists liaising extensively with rural households on this. While EcoDev has focused on promoting dehydrated onions on a commercial scale (through improving local food processing and rural enterprise development) price fluctuations, weather conditions and establishing a market demand have been limiting factors resulting in limited employment opportunities.⁴⁴ This all points to the significant challenges to expanding crop diversification, improve legume production and promote higher value commodities.

Lessons learned:

³³ Sereyvath, Park (GRET). 2013, p. 5

³⁴ Sereyvath, Park (GRET). 2013, p. 5

³⁵ Welthunger Hilfe (WHH). 2012, p.34

³⁶ Mekong Economics Ltd.. (LIFT). 2013.

³⁷ JICA. 2010a, p.12

³⁸ ACIAR. 2011a.

³⁹ Welthunger Hilfe (WHH). 2012.

⁴⁰ Martins, Dr. Christine and Aye Aye Khaing (WHH). 2013.

⁴¹ Matienzo, Rodolfo M. (CESVI). 2011.

⁴² EcoDev. 2013a

⁴³ ACIAR. 2011a.

⁴⁴ EcoDev. 2013a

- *Taking loans for crop production entails risk, as many factors influence the quality of the final yield and the fluctuation of the market influences potential crop prices. Therefore, farmers exercise caution in selection of new crops and take into consideration what market information may be available at the time.*⁴⁵
- *While some tests of growing new varieties (high yield corn variety in one case) produced higher yields and good market prices, others have proven unsuccessful due to pests and drought (chilli and peanuts in another case).*⁴⁶
- *Higher-yielding varieties of chickpea, pigeon pea and groundnut yielded as much as 35% more than traditional varieties and show potential for up-scale*⁴⁷ but more research is needed, particularly on barriers to adoption.
- *The potential success of higher yielding legume crops is partly subject to improvement in integrated farming methods including use of fertilizer, improved inoculants, pest management, better storage facilities, inter-cropping and supplementary irrigation.*⁴⁸
- *A need exists for research into further improvement of legume production.*⁴⁹
- *Village seed banks (including formal seed production at the village level) is a critical step in promoting new, high-yielding varieties due to the lack of a sufficient seed supply, seed grading, seed networks and poor storage facilities.*⁵⁰
- *No evidence of the commercial viability of the production of out of season vegetables (potatoes).*⁵¹
- *Agronomists have liaised extensively with farmers to identify interventions to increase and particularly diversify agriculture production (or reduce expenses for inputs) but failed to identify conclusive ideas.*⁵²
- *Production of thanaka and toddy palm may have greater market potential but with the exception of onions other vegetables (gourds, mustard, radish, tomatoes etc.) are mainly used for own consumption. Only the fruits of tamarinds, local plums and bananas are found in abundance and frequently sold.*⁵³
- *Identifying a market demand is crucial to the success of any rural enterprise development and crop diversification intervention.*^{54, 55}
- *Expansion of area for growing peanuts was relative high in one area as long as higher income was ensured.*⁵⁶
- *Adaption of home gardening following project interventions were low due to the dependence on water availability, access to land, weather condition and locally adaptable vegetable seeds.*^{57, 58, 59} Moreover, households tend to grow vegetable only for home consumption while markets are well served with vegetables from other areas where they can be grown with higher profit margins.⁶⁰
- *Mushroom production could provide beneficial income source for the landless because it doesn't require arable land but overcoming barriers have proved difficult (such access to telephone, procedures for paying inputs, provision of initial cost, yield character with great variability and access to markets etc.)*⁶¹

⁴⁵ Mekong Economics Ltd.. (LIFT). 2013.

⁴⁶ Mekong Economics Ltd.. (LIFT). 2013.

⁴⁷ ACIAR. 2011a.

⁴⁸ ACIAR. 2011a.

⁴⁹ ACIAR. 2011a.

⁵⁰ ACIAR. 2011a.

⁵¹ Matienzo, Rodolfo M. (CESVI). 2011.

⁵² Welthunger Hilfe (WHH). 2012.

⁵³ Welthunger Hilfe (WHH). 2012, p. 8

⁵⁴ EcoDev. 2013a

⁵⁵ Matienzo, Rodolfo M. (Cesvi). 2011.

⁵⁶ Matienzo, Rodolfo M. (CESVI) . 2011, p. 34

⁵⁷ Dr. Ko Ko Zaw, U Khin Maung Tun and Salai Khin Maung Aye (Save the Children). 2012, p. 2

⁵⁸ Martins, Dr. Christine and Aye Aye Khaing (WHH). 2013, p. 25

⁵⁹ Welthunger Hilfe (WHH). 2012.

⁶⁰ Cools, J. W. F. 1995, p. A1-35

⁶¹ JICA. 2010a, Executive summary, p. 14

6. Access to inputs: fertilizer, pesticides, seeds

Overall, the agriculture productivity in the Dry Zone is reduced due to farmers lacking drought tolerant crop varieties, low application of inputs and low soil moisture content in combination with other factors. The majority of farmers use their own seeds over a long period, resulting in a low yield level and poor quality.⁶²

Limited lessons learned are available from the accessed documents in relation to improved access to inputs such as fertilizer, pesticides and seeds. It is unclear if this is due to few agencies focusing on this in the Dry Zone (unlike in the Ayeyawaddy Delta) or that limited information has been documented/made available. Hence the below information relies partly on Welt Hungerhilfe (WHH)^{63, 64} (seed provision and seed banks) and on ACIAR (in relation to legume production)⁶⁵. Despite some positive results by WHH, interventions were negatively impacted by adverse weather conditions (cyclone Giri, flash floods and drought) – also ADRA reported droughts as an increasing risk to the success of seed banks.⁶⁶ The ACIAR research project focused on improving legume production through developing higher yielding strains but also provides lessons learned in relation to access to inputs (fertilizer, pesticides and seeds including the need for inoculation of seeds).

The very comprehensive ‘Guidelines for water and soil conservation in the Myanmar dry zone’, prepared for FAO and UNDP, also stresses the importance of improved seeds emphasizing that crop variety selection must focus on the need for early (short) maturing varieties.⁶⁷ Moreover, increased crop intensification will have to focus more on efficient use of low cost inputs (specifically tillage methods, bio-composting and integrated pest management) rather than increased levels of purchased inputs.⁶⁸

Lessons learned:

- *Drought is an increasing risk to the success of seed production and seed banks. Agencies should consider building in irrigation as part of the intervention and promoting drought tolerant crop varieties.*
- *Seed banks (revolving funds) in combination with provision of seeds - mainly pulses and sesame (green gram, groundnuts, pigeon peas, lablab beans, maize and chick pea) – have been successful in increasing the availability of seeds in the villages and lowering the interest rates.*
- *The seed banks diversified credit sources and resulted in that farmers did not have to sell their crop directly after the harvest and borrow new seeds at planting time (with a 100% interest rate).*
- *The amount of seeds in the seed banks increased due to the interest paid, and increasingly more people benefit from the seeds. However, adverse weather conditions led to lower (in-kind) repayment rates than anticipated.*
- *Seed banks run by village committees helped reinforce the organizational capacities of communities.*

Legume-focused:

- *Moisture stress was the prime constraint to legume production, followed by the non-availability of good quality seed.*
- *Promoting village seed banks is a crucial step in expanding production of higher-yielding and farmer-preferred varieties of legumes.*

⁶² Myat Thuzar Thein et al. 2009, p. 38

⁶³ Welthunger Hilfe (WHH). 2012.

⁶⁴ Martins, Dr. Christine and Aye Aye Khaing (WHH). 2013.

⁶⁵ ACIAR. 2011a.

⁶⁶ Thar Tun Oo, Dr. Thaug Htay and Salai Khin Maung Aye. (ADRA) 2010, p. 24

⁶⁷ Carucci, Volli. F. P. 2001, p. 111

⁶⁸ Carucci, Volli. F. P. 2001, p. 115

- *The farmer participatory varietal selection (FPVS) program was very productive in identifying high yielding varieties.*
- *Several issues need to be addressed to ensure effective future seed flows (of legumes through village seed banks): lack of appropriate storage facilities, timely rouging of off- types, seed grading, and availability of timely inputs to farmers.*
- *Access to fertilizer is limited due high costs and lack of availability.*
- *Trials comparing conventional (chemically-based) fertilizer inputs, biological inputs and a mixture of the two concluded that overall, the conventional input system produced the highest yields, with the hybrid chemical-biological system the most cost-effective.*
- *Chickpea-sunflower intercropping was found to be an excellent eco-friendly approach towards reducing insecticide applications, without compromising productivity.*
- *The effect of non-chemical options in the management of termites in groundnut at research farms indicated that application of tobacco leaf results in less incidence of damage and higher yield advantage.*
- *Low demand, production and supply of rhizobial inoculants for legumes are a problem in Myanmar.*

7. Water and soil conservation and reforestation

Water and soil conservation are of critical importance in the Dry-Zone, which is suffering from droughts and where soils generally have a low natural fertility. A thin vegetation cover and intensive farming practices have resulted in a low and declining content of organic matter. Soil texture, heavy rainfall, hardpan formation (common in upland areas), and thinning vegetation cover result in significant water-induced erosion. Strong winds also cause loss of precious topsoil. Within the Dry Zone, there is also a high degree of soil diversity, suggesting equally diverse and locally specific interventions are needed.⁶⁹

Increasing land productivity is key to breaking the poverty cycle. A main entry to improving the land productivity is to increase the available soil moisture through available soil and water conservation on farmer's land and in catchment areas.⁷⁰ Two detailed research studies on farming systems and soil and water conservation in the Dry Zone provide in-depth information about the situation in the area and suggest several priority interventions for programming.^{71, 72} They outline the principal causes of land degradation including irregular rainfall patterns, high incidence of drought, the limited land resources and increase in rural population. The detailed causes can be divided into *natural hazards* (water erosion, wind erosion, soil fertility decline, salinization), *direct causes* (deforestation of unsuitable land, inadequate fallow periods and overgrazing, low level of awareness for soil conservation and appropriate management practices, extension of cultivation to lands of lower potential and/or high natural hazards, limited practice of crop rotations, unbalanced fertilizer use etc.) and *underlying causes* (land shortage, economic pressures and population increase).⁷³ Water and soil conservation including reforestation has been carried out by several agencies in the Dry Zone. However, community involvement and ownership have in many cases not been sustained over time due to the lack of tangible results in terms on increased income in the short to medium term. Agencies struggle to convince communities to invest their time and efforts for these activities, particularly over time. Community Forestry (CF): One project established Community Forest User Groups (CFUG) as part of a community forestry component of a larger livelihoods and nutrition project. Despite a number of challenges CFUGs managed to secure 30-year CF user certificates for their land, constituting a big advocacy success of the project.⁷⁴ Many important lessons were learned. Two other

⁶⁹ LIFT. 2013, p. 38

⁷⁰ Cools, J. W. F. 1995, p. A1- 61

⁷¹ Kahan, David. 2001.

⁷² Carucci, Volli. F. P. 2001.

⁷³ Kahan, David. 2001, p. 14-15

⁷⁴ Dr. Ko Ko Zaw, U Khin Maung Tun and Salai Khin Maung Aye (Save the Children). 2012, p. 2

projects focused on soil conservation, watershed management and environmental awareness but faced several challenges, which were not only partly overcome.^{75, 76}

Lessons learned:

Soil conservation, watershed management and environmental awareness.^{77,78}

- *The soil conservation technique introduced by one project had significant positive short term and potential long-term impacts on both agricultural production techniques (improve soil fertility) and environment (reduce soil erosion, keeping land scape green) but it was costly and affordable to only a limited number beneficiaries. In response, implementation strategies with cost effective physical measures and biological measures to prevent soil erosion and environmental conservation were considered.*
 - *Conservation measures will not be successful unless closely linked with strategies for increasing agriculture productivity and profitability.*⁷⁹
 - *For an overview of advantages and disadvantages of different soil moisture and conservation measures relevant to the Dry Zone, see Kahan's 'Dry zone farming system study', prepared for FAO and UNDP.*⁸⁰
 - *An analysis of costs and benefits of soil bunding shows positive economic return. Large investment in an employment type programme could provide both employment and improved water and soil conservation, according to one study*⁸¹
-
- *Villagers prefer to focus their efforts on other agricultural production and income generating activities than preservation of trees. While nursery establishment and tree planting can produce long-term impact on ecology including watershed management as well as nutrient and income (in the case fruit trees), the lack of short-term impact is a barrier to community involvement and ownership.*
 - *Using tree species that are not well adapted to dry zone carries a high risk of many trees dying. Consequently local species or species that adapt well to the area should be used.*
 - *The majority of tree nurseries were well managed while the project was on-going but after project end most of them were abandoned due to a lack of buyers and few future prospects.*
 - *Past efforts of planting fuel wood or multipurpose trees at farmland has largely failed. Planting in other places associated with community ownership (catchment areas, monasteries, village wasteland etc.) could potentially be more successful.*⁸²
 - *It takes time, work and sustained measures of community mobilization for promotion of environmental awareness to result in behaviour change - and it does not always result in the expected support within the communities to undertake joint reforestation, watershed management and village greening actions.*

The following key points on water and soil conservation in the dry zone are drawn from Carucci's detailed guidelines for FAO and UNDP⁸³:

⁷⁵ Welthunger Hilfe (WHH). 2012.

⁷⁶ Sereyvath, Park (GREI). 2013.

⁷⁷ Sereyvath, Park (GREI). 2013, p.3 and p. 11

⁷⁸ Welthunger Hilfe (WHH). 2012, page 20

⁷⁹ Kahan, David. 2001, p. 111

⁸⁰ Kahan, David. 2001, p. 107- 110

⁸¹ Cools, J. W. F. 1995, p. A1-61, p. A1-63

⁸² Cools, J. W. F. 1995, p. A1-52

⁸³ Carucci, Volli. F. P. 2001.

- *A thorough understanding and analysis of erosion process is necessary for devising any sustainable intervention to arrest soil degradation.*⁸⁴
- *The most important component for the success and sustainability of conservation programmes is the involvement of the farmers/rural poor in all stages of the planning and implementation processes.*⁸⁵
- *Soil and water conservation is a gradual process and should be built up based on experience. Ready made solutions do not exist. The five main technical elements that needs to be ascertained for accuracy are: the behaviour of rainfall, estimation of run off, soils and landscape conditions, the land use and land capability, the type of soil and water conservation strategy to adopt in view of the crop water requirements.*⁸⁶
- *Two strategies exist to address the problem of low soil and water conservation: 1) Increase water ability, improve its utilization/disposal and safe run off for productive purposes (by use of rainfall multiplier systems and water harvesting measures), 2) Introduce measures for maximum water retention (by use of capturing rainfall and make the best use of it, increase the storage capacity of the soil and infiltration, avoid soil and water loses by run offs and reduce evapotranspiration).*⁸⁷
- *Rural people understand the water and soil problems but do not have sufficient resources to prioritize them i.e. the problem of low adoption of measures is not due to lack of awareness.*⁸⁸
- *Many existing soil and water conservation methods in the Dry Zone (soil storage and overflow dams and traditional stone bunds) have proven effective in the past. However, traditional measures cannot cope with current land degradation pressures.*
- *Measures for water and soil conservation should be tailored around the existing local knowledge. New techniques should be carefully explained and applied.*⁸⁹
- *Many water retention measures are labour intensive and hence not easy to convince farmers' to adopt.*⁹⁰
- *Many different water and soil conservation methods exist, which are relevant to the Dry Zone but due to the heterogeneity of the area, they must be specifically tailored to the individual area/farming plot.*⁹¹

Community Forestry: ^{92, 93}

- *Native plant species for tree plantations should be used rather than introducing outside species to ensure plant survival. Identification and selection of nursery plant species should be community-driven.*
- *Selection of nursery sites should consider not only soil type, but also salinity and type of water, as high salinity water is not conducive to seedling growth.*
- *Emphasise with CFUGs not only the technical aspects of CF, but also the application process to get 30 years user certificate, so they thoroughly understand the procedures.*
- *A strong advocacy and lobbying strategy of the implementing agency and the CFUGs was key to successfully navigating the process of official transfer of natural forestland to community forest and gain approval by the Forest Department, which is a cumbersome process (which may encounter resistance by local authorities).*

⁸⁴ Carucci, Volli. F. P. 2001.

⁸⁵ Carucci, Volli. F. P. 2001, p. 20

⁸⁶ Carucci, Volli. F. P. 2001, p. 53

⁸⁷ Carucci, Volli. F. P. 2001, p. 60, p. 70

⁸⁸ Carucci, Volli. F. P. 2001, p. 117

⁸⁹ Carucci, Volli. F. P. 2001, p. 117, 121, 122, 125

⁹⁰ Carucci, Volli. F. P. 2001, p. 125

⁹¹ Carucci, Volli. F. P. 2001, p. 125

⁹² Dr. Ko Ko Zaw, U Khin Maung Tun and Salai Khin Maung Aye (Save the Children). 2012, p. 2

⁹³ Welthunger Hilfe (WHH). 2012.

- *At the beginning of one project, the communities were not enthusiastic to change their traditional land use (farming, agriculture) into community forestry due to the conflicts between their immediate livelihood needs such as food and income and longer-term aspects of CF.*
- *Influence of local elites was a challenge to change current land use practice as rich landowners and village authorities tend to occupy many acres of farmlands located in Reserve Forest, all of which are illegal. If the CF lands are established under the regulation of CFI, they risked losing their farmland so they were reluctant to participate in the project activities. They also discouraged the FUG members from seeking to process land allocation and applications. Sustained community mobilization and building the capacity of staff was key in overcoming these challenges.*
- *Effective strategies in response to challenges included community mobilization through organizing advocacy and awareness raising meetings, and providing technical supports, mentoring and coaching to the FUGs for attracting their interests on CF by both financial and material supports on major field operations, local empowerment, and community participation through provision of cash-for-work and social forestry activities, etc.*
- *Understanding of the implications of existing social and economic processes for proposed changes in natural resource management, including benefit sharing, increased participation and promoting awareness amongst the communities is not an easy task for the project staff within a relatively short period.*
- *Technical processes alone are insufficient to bring about changes. It also requires strong institutional capacity to be developed to fully empower the FUGs in order to deliberate on and influence land use policies.*
- *A healthy and effective combination of short-term benefits for poor households in the target villages (through cash-for-work) and long-term benefits for the whole community and CFUG members is important to ensure support for CF.^{94, 95}*

8. Livestock management, pasture improvement, animal health services

All but two of the eight projects, which provide support for livestock production (goats, pigs, chickens) in the Dry Zone, conclude that the intervention has been largely successful with a positive impact on household income and relevant to the needs of the farmers and farm labourers in the area. Associated revolving funds are generally sustainable⁹⁶ - and also provided a buffer in times of shock.^{97, 98} However, having adequate access to fodder, particularly for pigs, is a reoccurring challenge which needs to be better addressed, particularly in the light of the impact of irregular weather patterns, which has led to great crop losses but at the same time increased the interest of many farmers and farmer labourers in diversifying towards livestock production.⁹⁹ The issue of adequate animal health services also needs attention. Problems of over-grazing were not mentioned as a major problem in project reports although studies on farm systems and soil conservation highlighted that this may be a potential problem.

A detailed analysis of the potential of different animal species to improve livelihoods of small-scale livestock producers in the Dry Zone by ACIAR provides good analysis to inform programming. It prioritizes a selection of village chickens, small ruminants (sheep and goats) and indigenous cattle as target species for a potential research project.¹⁰⁰

Lessons learned:

- *Livestock provision including revolving funds is successful in providing a buffer in time of shock but must be accompanied by training in/ availability of fodder production to reduce the risks of pigs being a food competitor vis-à-vis poor*

⁹⁴ Dr. Ko Ko Zaw, U Khin Maung Tun and Salai Khin Maung Aye (Save the Children). 2012.

⁹⁵ Save the Children. 2012.

⁹⁶ Dr. Ko Ko Zaw, U Khin Maung Tun and Salai Khin Maung Aye (Save the Children). 2012, p. 5

⁹⁷ Thar Tun Oo, Dr. Thaug Htay and Salai Khin Maung Aye. (ADRA) 2010.

⁹⁸ Thar Tun Oo, Dr. Thaug Htay and Salai Khin Maung Aye. (ADRA) 2010.

⁹⁹ Mekong Economics Ltd.. (LIFT). 2013.

¹⁰⁰ ACIAR. 2011b.

households and to avoid environmental degradation as a result of over grazing.^{101,102}

- *More attention is needed to ensure that beneficiaries clearly understand the advantages of vaccination, as the success or failure of livestock breeding depends to a high extent on regular vaccinations.*¹⁰³
- *Beneficiaries need access to quality animal health services for effective treatment and vaccination.* There are not enough trained veterinarians to provide these services to smallholders at village level along with insufficient incentive for veterinarians to provide services in most rural areas. Therefore village animal health workers (volunteers) based in the communities themselves need to be trained in animal health and basic procedures for vaccination. To be effective, these workers need to have strong linkages to LBVD township veterinary staff that can provide technical support and coordinate vaccination programs.^{104, 105}
- *Secure local market access to fair prices for livestock is relevant so that that livestock farmers can achieve a reasonable profit from their investment and avoid having to sell to private license holders at a low price.*¹⁰⁶
- *The most appropriate type of livestock or poultry depends to a large extent on the particular conditions of each village, which varies considerably.* In some areas, cow and goat raising should be prioritised as they tend to be more resilient and to thrive in the ecological limitations of the Dry Zone but they require plenty of grazing land. In other areas (for example Pakokku and Magway Townships) pigs are preferred due to the lack of pasture and the possible conflict that goats can create if they eat the cash crops of the farmers.¹⁰⁷
- *Chicken raising is an appropriate and strategic activity for poor households (in one project more than three thirds of beneficiaries multiplied their chickens within one year)*¹⁰⁸ However, in addition to chicken house, the project should also introduce chicken cages where appropriate for better control of the chicken (to avoid disease contamination and destruction of plants in household garden).¹⁰⁹ Chick survival rates are low but vaccinations in combination with supplementary feeding, confinement (bamboo coops) and creep feeders have shown markedly improved health and production of village chickens.¹¹⁰
- *Goat breeders experienced good results within a short time. The use of revolving goats' schemes – and other revolving funds for livestock - is associated with high level of rotation and sustainability.*¹¹¹ However, there are opportunities to increase survival rates and increasing growth rates of sheep and goats through improved flock management, animal health surveillance (e.g. parasites), treatment when needed, and feeding interventions.¹¹² Goat raising is more profitable than sheep raising.¹¹³
- *A lack of feed and the high cost of purchasing feeds are major constraints to profitable cattle production (cattle are used for draught power, sale of calves and milk production).* There are opportunities to increase productivity of indigenous cow-calf and milk production by improving fodder supply, feeding systems and reproductive management, and fattening cattle prior to sale to improve sale value.¹¹⁴
- *Planting leucaena trees for animal fodder on boundaries of plots have little chance of success (competes with cash crops, seedlings eaten by animals etc.). However, if large-scale production of animal feeds was established, this could significantly improve the fodder situation (as the case in other countries).*¹¹⁵

¹⁰¹ Thar Tun Oo, Dr. Thaug Htay and Salai Khin Maung Aye. (ADRA) 2010, p. 11

¹⁰² Dr. Ko Ko Zaw, U Khin Maung Tun and Salai Khin Maung Aye (Save the Children). 2012, p. 2

¹⁰³ Dr. Ko Ko Zaw, U Khin Maung Tun and Salai Khin Maung Aye (Save the Children). 2012.

¹⁰⁴ FAO, p.2

¹⁰⁵ Dr. Ko Ko Zaw, U Khin Maung Tun and Salai Khin Maung Aye (Save the Children). 2012, p. 2.

¹⁰⁶ Dr. Ko Ko Zaw, U Khin Maung Tun and Salai Khin Maung Aye (Save the Children). 2012, p. 5.

¹⁰⁷ Save the Children. 2012.

¹⁰⁸ Sereyvath, Park (GRET). 2013, p. 4

¹⁰⁹ Sereyvath, Park (GRET). 2013, p. 27

¹¹⁰ Henning *et al.* 2008 ref. in ACIAR. 2011b, p. 17

¹¹¹ Thar Tun Oo, Dr. Thaug Htay and Salai Khin Maung Aye. (ADRA) 2010

¹¹² ACIAR. 2011b, p. 17

¹¹³ JICA. 2010a. Executive summary, p. 13

¹¹⁴ ACIAR. 2011b, p. 8

¹¹⁵ Cools, J. W. F. 1995, p. A1-45, - A1-48

- *The potential sustainability of the livelihood strategies involving pigs must be carefully considered* due to the problem of sourcing better quality piglets, vaccination and other related veterinary services problems, and to ensure financing of production, especially related to feeding, after the end of the project. The cost and returns of raising pigs for fattening and other purposes must be carefully considered. Other important considerations are the source of feeds and the initial income and asset position of the landless to be able to engage in an enterprise that requires incremental funding, access to such financing, technical resources available to deal with swine diseases and may face problems with marketing.¹¹⁶ ACIAR concludes that while “*there would be opportunities for improving smallholder pig production, the need for purchased feed inputs, the risk of fluctuating prices and the risk of disease outbreaks make this production system less suitable for resource-poor households.*”¹¹⁷ In short, raising pigs for breeding is profitable only with sufficient water, cash, feed (often poor households do not have this) and access to nearby markets.¹¹⁸

9. Agriculture and food production marketing

Overall weak linkages to markets remain a key barrier to increasing incomes in the agriculture and food-processing sector in the Dry Zone. In addition to underdeveloped infrastructure (bad roads and lack of affordable and reliable transportation), producers have traditionally had a limited understanding of the market and had limited bargaining power vis-à-vis buyers (due to high debts levels, lack of alternative buyers and/or lack of market information). They tend to sell opportunistically to local buyers either directly, to a broker/middleman or wholesale.^{119, 120}

Food production marketing

Few implementing agencies have focused on improving the weak linkages between communities and markets.¹²¹ Most have also ignored or significantly underestimated the extent to which weak market linkages undermine the profitability of interventions aimed at adding value to food produce.

Training and provision of equipment for home production of dried onions, snacks, edible oil, plum juice, toddy palm sugar making and other micro-businesses based on food processing have been promoted by several implementing agencies. It has in some cases made a limited positive difference within the household in terms of consumption and expenditure¹²² and one project reports a quick positive impact on the household economy of a limited number of poor beneficiaries.¹²³ Promotion of toddy stove making and toddy sugar production by one implementing agency is one of the few interventions that was clearly effective in promoting income generation among poor (toddy) families and more efficient use of fuel. 76% of sampled beneficiaries reported a fair, good or excellent improvement in income due to mainly the new stove technology, which significantly improved their incomes and reduced costs.¹²⁴

However, overall evaluations concluded (with the exception of toddy stove promotion) that the interventions have not resulted in providing significant or sustained additional income or new job opportunities for the target beneficiaries. They stress that there is much scope for improvement in particular in relation to market access.^{125, 126} Evaluators point to the that the main reason for the limited success of the interventions are due to lack of attention to the importance of the following when designing and implementing the interventions: market linkages, market demand for the product, awareness of market chains, availability of market information, transportation, packaging and labelling and upgrading the quality of the product.¹²⁷

¹¹⁶ Matienzo, Rodolfo M. (CESVI). 2011, p.18

¹¹⁷ ACIAR. 2011b, p. 49-50

¹¹⁸ Cools, J. W. F. 1995, p. 15, A1-51

¹¹⁹ Mekong Economics Ltd.. (LIFT). 2013.

¹²⁰ Welthunger Hilfe (WHH). 2012, p. 7

¹²¹ Mekong Economics Ltd.. (LIFT). 2013.

¹²² Dr. Ko Ko Zaw, U Khin Maung Tun and Salai Khin Maung Aye (Save the Children). 2012.

¹²³ Sereyvath, Park (GRET). 2013.

¹²⁴ Dr. Ko Ko Zaw, U Khin Maung Tun and Salai Khin Maung Aye (Save the Children). 2012.

¹²⁵ Dr. Ko Ko Zaw, U Khin Maung Tun and Salai Khin Maung Aye (Save the Children). 2012.

¹²⁶ Sereyvath, Park (GRET). 2013, p. 11

¹²⁷ Mekong Economics Ltd.. (LIFT). 2013

Access to market for agriculture produce

Limited efforts by implementing agencies in relation to market linkages and dynamics go beyond activities related to food processing and added value. It is a more general issue among LIFT implementing partners in the Dry Zone and other areas. The mid-term review of the LIFT programme (draft, 2013)¹²⁸ emphasises that current efforts by LIFT implementing partners are not identifying suitable market entry points for services, as well as crops and specialised commodities. “Almost all of the IPs and sub-IPs have achieved only basic, minimum success in working with and linking their project activities to the local and regional markets. In most cases, activities are almost uniformly promoted without an understanding or analysis of the local markets or full consideration of value chains to ensure that promoted activities are appropriate and feasible. Rather than responding to market demands, many projects appear to be focused on market supply.”¹²⁹

Some initial progress has been made in improving access to markets for farmers in the dry-zone, although the activities remain limited in scale and lessons learned over time have yet to be observed. LIFT partners in the Dry Zone provided market information services through:

- *Daily radio broadcasts* on market prices through a private FM radio station, which are listened to by farmers and/or their family members. The market information is less useful for small-scale farmers than for medium-size and large-size farmers and traders.
- *Better access to traders* by updating books with contact information for traders.
- *Information sharing* through face-to-face meetings such as market actor meetings, workshops and a trade fair. Membership organisations initiated collective marketing and promotion of its members who gained benefits such as access to quality inputs.
- *Physical marketplace infrastructure* such as commodity exchange centres, which both farmers and the traders appear eager to support. The farmers are interested in obtaining a better price and the traders want to source produce at one place without having to visit many farmers.

It is important to stress that some constraints in relation to market access are not easily overcome – and some lie beyond the scope of what a project intervention can address. The LIFT annual report 2012 (draft) stresses that in the dry-zone the ability of farmers to sell their produce at higher prices and find better markets is also limited by the variable quality of their agricultural produce. Bad infrastructure, transportation costs and commission to brokers can affect farmers’ abilities to sell their produce for the best price, especially if the best price is with traders from different regions and involves additional transportation costs. This is the case in the dry-zone but also more generally.¹³⁰

Lessons learned:

- *Weak market linkages is a significant barrier to improving incomes and job opportunities.*
- *Few implementing agencies have focused on improving the weak linkages between communities and markets.*
- *Interventions in food processing and marketing have achieved limited results in the short-term – and not resulted in providing significant or sustained additional income or new job opportunities for the target beneficiaries – due to a lack of focus on market access and demand.*
- *The potential for added value food processing to generate additional income and job opportunities can be improved by fully integrating improvement of market linkages and a better understanding of market dynamics and market demands into project design and implementation.*
- *Market chain support for input supplier and producer levels needs not only financial and technical support but also conceptual understanding and awareness of market chains to create reliable market opportunities.*
- *Some initial progress has been made in improving access to markets for farmers in the dry-zone, particularly in relation*

¹²⁸ Mekong Economics Ltd. (LIFT). 2013.

¹²⁹ Mekong Economics Ltd. (LIFT). 2013.

¹³⁰ LIFT. 2013, p. 43

to market information for agriculture produce, although the activities remain limited in scale.

- *Some constraints to market access lie beyond what a local project intervention can address.*

10. Vocational training

Vocational training interventions in the Dry Zone have been supported by a number of agencies (among these are ADRA, Save the Children and Welt Hunger Hilfe). The interventions have generally focused on equipping landless labour with vocational skills such as sewing, auto mechanics, carpentry, toddy stove production, food processing and small entrepreneur management with the aim to increase income opportunities. *The results are mixed.* The most successful project documents a 31% increase in income (versus the baseline) and 10% lower seasonal migration among the target group. It concludes: *“Equipping the landless labour with vocational skills is the greatest of the results achieved.”*¹³¹ Meanwhile several other projects can only demonstrate few results in terms of increased jobs and income mainly due to lack of job opportunities in the local area and/or saturation of the employment market where a high number of trainees in a small area are now competing with one another with their crafts and skills (with the result that it is risky to invest in setting up one’s own business using the new skills as it risks going bankrupt due to the competition.).^{132, 133} There is no conclusive evidence as to which type of vocational training provides the best income opportunities. However, there has been some success in setting up revolving schemes through which trainees can access start up kits and/or funds.¹³⁴

Lessons learned:

- *The results from vocational training interventions in the Dry Zone are mixed in terms of increasing income and job opportunities for the target beneficiaries i.e. landless labour.*
- *Most agencies have not adequately assessed the demand for the skills at the employment market.*
- *Vocational skills training can be effective in increasing job opportunities and income for landless labour if start up kits/funds are provided enabling trainees to immediately engage in business and improve income; a thorough needs and market assessment is carried out to identify what skills are needed and what employment is available; the number of trainees in the local area remains relatively low to avoid saturation of the employment market and competition among trainees.*

Note: Skills training relating to food processing and marketing is covered in section ‘9. Agriculture and food production marketing’.

11. Cash-for-work

Only two of the assessed reports^{135, 136} included cash for work (CfW) activities mainly for landless labourer. The activities involved tree nurseries, pond excavation, building banks, dams and other soil conservation activities, and planting trees for watershed protection around ponds and in the agro-forestry sites. The assessment of the results is mixed and only provides limited information to identify lessons learned. For information about CfW as social protection, see section 3.

Lessons learned:

- *While the cash-for-work activities did not contribute to long-term income generation and improved livelihoods of the poor over time, they did help landless poor to overcome momentary financial problems.*

¹³¹ Thar Tun Oo, Dr. Thaug Htay and Salai Khin Maung Aye. (ADRA) 2010, p.8

¹³² Welthunger Hilfe (WHH). 2012, p. 7

¹³³ Mekong Economics Ltd.. (LIFI). 2013.

¹³⁴ Thar Tun Oo, Dr. Thaug Htay and Salai Khin Maung Aye. (ADRA) 2010, p.8

¹³⁵ Dr. Ko Ko Zaw, U Khin Maung Tun and Salai Khin Maung Aye (Save the Children). 2012.

¹³⁶ Welthunger Hilfe (WHH). 2012.

- *The cash-for-work schemes were also somewhat effective in the creation of asset replacement and improving soil conservation.*

12. Nutrition

Only one agency has made available extensive experience of implementation of projects focused on improving nutrition levels in the Dry Zone (Save the Children).^{137, 138} The aim has been to reduce acute and chronic malnutrition among children through promoting breastfeeding, which has resulted in a reduction of the level of global acute malnutrition by half and moderate chronic malnutrition by one-third among target beneficiaries. The interventions have focused on a mix of education sessions, conditional behaviour change, cash transfers, care and hygiene, breastfeeding support groups, village health teams and strengthening links with existing outreach health services as well as supporting referral and treatment. It was implemented in cooperation with Myanmar Nurse and Midwife Association (MNMA). In addition one other agency (ADRA) has mainstreamed messages aimed at combating malnutrition into food production activities but very little information/ evidence is available about the results. It simply concludes that this has resulted in households prioritising to meet household food needs and in changes in food preparation retaining nutrients.¹³⁹

Lessons learned¹⁴⁰:

- *Interventions to reduce malnutrition through focusing on promoting breastfeeding can be very effective.*
- *Education sessions combined with the efforts of support groups and village health volunteers helped mothers practice exclusive breastfeeding and colostrum feeding.*
- *It is important not to limit the focus of follow up activities to mothers as often grandmothers are key carers for malnourished children and often mothers in law have a heavy influence on slow adaptation of exclusive breast feeding.*
- *The resistance of the older generation to new practices (breastfeeding) can be overcome when they witness a change in children's health, growth, development and a reduction in the incidence of illness.*
- *The partnership with MNMA provided valuable expertise and a good link with existing outreach health services including midwifery services and other antenatal, immunisation and health care services.*
- *Health system strengthening to support the referral and treatment of children with malnutrition is vital to ensure the sustainability of the intervention alongside other support with regards to Infant and Young Child Feeding (IYCF), care and hygiene practices, which can be supported at a village level through village health volunteers.*

¹³⁷ Dr. Ko Ko Zaw, U Khin Maung Tun and Salai Khin Maung Aye (Save the Children). 2012, p. 3, p. 9

¹³⁸ Save the Children. 2012.

¹³⁹ Thar Tun Oo, Dr. Thaug Htay and Salai Khin Maung Aye. (ADRA) 2010, p. 20

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Terms of Reference

Desk review of lessons learned from ongoing and previously implemented rural development interventions in the dry zone of Myanmar

The objective of the review is to draw lessons, both positive and negative, from available documentation on a selection of rural development initiatives that have been conducted in the central dry zone of Myanmar.

For that purpose, the reviewer should look for lessons, including but not limited to, the following thematic:

- Community development approaches
- Community and farmer organisation
- Social protection
- Agriculture extension: Farmer-Field-Schools and other extension tools
- Crop diversification, legume production, higher value commodities
- Access to inputs: fertilizer, pesticides, seeds (seed production, seed bank...)
- Access to water for consumption and agriculture purpose
- Water and soil conservation / reforestation
- Micro irrigation
- Livestock management, pasture improvement, animal health services
- Agriculture & livestock production marketing
- Vocational training
- Cash-for-work

This list is not exhaustive of potential existing initiatives. Lessons should be drawn from available documentation transmitted by LIFT.

Duration: one week for one consultant

Expected output: a 10 pages summary with references to be annexed with the dry zone program formulation report

ANNEX 1: Access to water for consumption and agriculture purpose

The Dry Zone receives the lowest amounts of rainfall in the country with the largest variability in both timing and amounts. The area is prone to erratic rainfall and prolonged dry spells that are a regular threat to rural livelihoods. This is compounded by clay and sandy soils with a high risk of water and wind erosion leading to land degradation and declining agricultural production.

Lack of access to water for consumption and agriculture is a decisive factor contributing to food insecurity in the area.¹ Hence the need for irrigation and sustainable access to water sources is high.

Myanmar has a long history of irrigation that extends back to the former kings. Furthermore, implementation of irrigation schemes has been given special emphasis especially in the Dry Zone. In the last 20 years the number of irrigation projects implemented by the government has accelerated. However, many of the new schemes have performed much below anticipated and design levels of productivity due to substandard design and implementation.² In addition to pumped irrigation projects (PIPs), which mainly use river water, the last ten years has seen a rapid growth in the exploitation of groundwater. In addition surface water from ponds is also a major water source – primarily for consumption but also for livestock and agriculture.

The Water Resource Utilities Department (WRUD) along with other departments at Ministry of Agriculture and Irrigation are mainly responsible for interventions related to PIPs while a number of international agencies have implemented projects related mainly to increasing access to water through rehabilitation of ponds, wells and piped systems.

LIFT has commissioned in-depth reports of the current status of PIPs in the Dry Zone conducted by Anderson Irrigation & Engineering Services including detailed programme formulation documents for improvement of four prioritised PIPs, which has been made available to the Consultant. The lessons learned on PIPs outlined below are drawn from these reports. However, it should be emphasized that as the project is yet to be implemented so the lessons learned are less from implementation of externally funded projects – and instead some key points outlining what has not worked so far and what need to be improved to ensure the success of PIPs in the Dry Zone. It is highly recommended that anyone interested in lessons learned for PIP irrigation in the Dry Zone read these reports in full.

The other key source of information is the LIFT commissioned community survey and project formulation documents by the International Water Management Institute (IWMI) which focuses more broadly on access to water in the area (formal irrigation systems, ground water interventions, rain water harvesting, watershed management etc.) and includes a summary of lessons learned from international programs in this area (highlighted below).^{3,4}

The lessons learned outlined below are separated into two sections. The first is based on the IWMI reports and relate mainly to the use of ground and rainwater in the Dry Zone - while the second deals with PIPs based on the findings by Anderson.

Lessons learned 1

- A broad suite of water-related interventions is already used within Dry Zone. Existing studies and agencies working in the area emphasize that *there is a good understanding of issues and potential solutions within*

¹ Anderson Irrigation & Eng. Serv. Ltd. 2012 (a), p. 14

² Anderson Irrigation & Eng. Serv. Ltd. 2012 (a), p. 10

³ Sonali Senaratna Sellamuttu et al. 2013 (IWMI Component 2)

⁴ Johnston, Robyn et al. 2013. (IWMI Component 3)

local communities and agencies. The need is not so much for new technologies, but for approaches to support implementation; and refinement and targeting of known technologies.⁵

- *Community survey findings: Overall, the rehabilitation or construction of rainwater harvesting pond was a preferred option by farmers in almost all areas.* Rehabilitation or extension of existing irrigation infrastructure is a preferred option among some types of farmers in villages with irrigation all year round. Groundwater interventions are preferred over others by some types of farmers in villages with supplemental wet season irrigation.⁶
- *Rehabilitation or construction of rainwater harvesting pond has the potential to have an impact in all areas for all farmer-types,* by increasing access to water for drinking, domestic use and livestock.⁷
- *Rehabilitation and extension of canal irrigation may positively impact landed and marginal farmers* in areas with year-round irrigation; but further research is required to understand whether these efforts would be cost-effective.⁸
- *When considering groundwater interventions, factors such as the quantity of groundwater available, installation costs, operation and maintenance costs and replacement costs are important considerations.*⁹
- *Groundwater interventions with pumping are likely to impact landed and marginal farmers in areas with supplemental irrigation; however rising diesel prices and shortage of electricity challenge the efficacy of these interventions.*¹⁰
- A critical lesson from current programs is *the importance of embedding water into broader village livelihood strategies,* taking account of the full range of uses, rather than a focus on domestic supply separate to other needs.¹¹
- *Action Aid and ADRA have developed participatory methods for working with communities to ensure that water interventions are closely linked into village development plans,* with clear delineation of responsibilities for construction, operation and maintenance. They and Proximity Design also stress the importance of improving access to water (as well as availability) through piped systems, access points and pumping for ponds.¹²
- *Tube wells and small reservoirs are the most common focus for current projects on domestic water supply; but for both, on-going maintenance is a significant problem.* JICA (2010) found that many existing rural water supply tube wells were in poor repair or not functioning. They attribute this in part to poor siting and construction, and in part to lack of trained engineers for operation and maintenance.¹³
- *Maintenance and desilting of ponds at least every 2-3 is critical to maintain viable volume;* but NGOs working in the Dry Zone report that regular maintenance is often neglected, which means that more expensive and difficult renovation is then needed.¹⁴
- *There are no blanket solutions for pond renovations –* needs must be assessed and appropriate solutions designed for each village, in the context of village livelihood patterns and resources, according to

⁵ Johnston, Robyn et al. 2013, p. 18

⁶ Sonali Senaratna Sellamuttu et al. 2013, p. 1-3

⁷ Sonali Senaratna Sellamuttu et al. 2013, p. 63

⁸ Sonali Senaratna Sellamuttu et al. 2013, p. 63

⁹ Sonali Senaratna Sellamuttu et al. 2013, p. 63

¹⁰ Sonali Senaratna Sellamuttu et al. 2013, p. 63

¹¹ Johnston, Robyn et al. 2013, p. 18

¹² Johnston, Robyn et al. 2013, p. 18

¹³ Johnston, Robyn et al. 2013, p. 18

¹⁴ Johnston, Robyn et al. 2013, p. 18

Proximity Design.¹⁵

- *It is important to involve village communities and district/ local government agencies (GAD, DI) in planning, construction and management of village reservoirs.*¹⁶
- *Village reservoirs can provide livelihood opportunities for the landless: for example, through payments for construction, management and maintenance, or establishment of community forests/woodlot around pond as part of watershed management. Cash for work has been a successful model for construction of ponds, administered through community-based organisations (CBOs).*¹⁷
- *IWRM concludes that small reservoirs for rainwater harvesting and storage emerge as the preferred option for improving water supplies for villages in many contexts in the Dry Zone.*¹⁸

Lessons learned 2

- *The current low levels of crop production especially in the monsoon season can only be adequately addressed through the timely and adequate provision of irrigation water supported by reliable, regular and experienced advice and inputs from agricultural extension services. Within government, these are currently lacking and although they concentrated in the past on rice and certain priority crops, the services were not accessible to most ordinary resourced poor farmers with land on the PIPs and not forming parts of model farms.*¹⁹
- *The quality and sustainability of PIP interventions has been compromised by the national thrust to move forward with irrigation developments as quickly as possible. Technical designs have not been appropriate and lack of adequate funding has impacted negatively on construction, management, operation and maintenance (MOM).*²⁰
- *Water management throughout the existing PIP systems is poor due to (i) inappropriate structures, (ii) significant water losses along the system, (iii) a lack of rotation of supplies and scheduling leading to small flows being delivered over too wide an area, and (iv) the on-farm water management practices used by most farmers.*²¹
- *As most of the irrigation and drainage systems are designed to grow rice under flood conditions (despite the soils in many of the irrigated areas being unsuitable for flood irrigation), little attention has been given to drainage. Moreover, provisions been not been made for alternative of irrigating permeable soils especially during the summer cropping season. This must needs to be addressed if alternative crops are to be grown.*^{22, 23}
- *Very little consideration has been given to how the farmers deal with the water that is delivered to them and how it is distributed and shared amongst them.*²⁴

¹⁵ Johnston, Robyn et al. 2013, p. 29

¹⁶ Johnston, Robyn et al. 2013, p. 29

¹⁷ Johnston, Robyn et al. 2013, p. 4, p. 29

¹⁸ Johnston, Robyn et al. 2013

¹⁹ Anderson Irrigation & Eng. Serv. Ltd. 2012 (a), p. 10

²⁰ Anderson Irrigation & Eng. Serv. Ltd. 2012 (a), p. 15

²¹ Anderson Irrigation & Eng. Serv. Ltd. 2012 (a), p. 31

²² Anderson Irrigation & Eng. Serv. Ltd. 2012 (a), p. 22

²³ Anderson Irrigation & Eng. Serv. Ltd. 2012 (c), p. 16

²⁴ Anderson Irrigation & Eng. Serv. Ltd. 2012 (a), p. 22

- *Many of the (government) training institutions from which the staff of WRUD are drawn have been effectively isolated in recent years, lack appropriate specialists, provide limited training and practical experience and have produced systems that delivers water without considering the land or the end-users. Identified trainings needs include planning, design, construction, irrigation agronomy/farming, management operation and maintenance –including staff developing an awareness of the needs and involvement of farmers.*^{25, 26}
- *The experience and understanding of Water Users Organisations (WUOs) has not kept pace with the considerable developments both in the region and internationally. Farmers must be closely involved in all aspects of the management, operation and maintenance (MOM) of irrigation and drainage schemes – and government involvement in MOM must be reduced to a minimum.*²⁷
- *The scope for drastically improving cropping patterns on the PIPs is considerable so long as obligation to grow rice on irrigated land is removed.*²⁸
- *Rehabilitation and upgrading of the current irrigation and drainage system has the potential to significantly improve water reliability and increase cropping intensity in many areas, from an average of 220% to 300%. However, this is contingent on that the Government of Myanmar (GOM) must ensure that adequate provisions are made to support the operation and maintenance of the PIPs, as well as the project offices and extension services (in the years following the end of the envisaged project).*²⁹
- *A move to 3 crops per annum on a regular basis as a result of improved irrigation water availability would provide significant contributions to the livelihoods of the benefitting farm families. However, crop choice must be left to the farmer. In other words, the state-induced rice-growing obligation for irrigated areas (which mostly results in a financial loss to farmers as soils are not suited to rice growing and outcomes are low) must be removed.*³⁰
- *Contrary to the production of rice, the Dry Zone has a strong comparative advantage in the production of export-grade pulses and oilseeds, which have been exported internationally for many years. Moreover, it seems that the combination of domestic and international market demand is capable of absorbing substantial increases in the supply of these commodities without significantly depressing prices.*³¹
- Working Paper 3 by Anderson Irrigation & Engineering outlines a number of *very detailed and important observations in relation to agriculture practices in the Dry Zone and the types of interventions needed to improve agriculture production in relation to the PIPs.* These include: Change in cropping pattern introducing in some instances new crops to the PIP and in other cases new crop sequences; adoption of improved crop varieties; use of crop residues for mulching; introduction of reduced tillage and zero tillage farming; rhizobium inoculation of legumes; use of basal (starter) fertiliser; targeted plant populations; integrated pest management; integrated weed management; irrigation type, timing and technique; increased market opportunities; agronomic extension support to farmers.³²

²⁵ Anderson Irrigation & Eng. Serv. Ltd. 2012 (a), p. 10

²⁶ Anderson Irrigation & Eng. Serv. Ltd. 2012 (g)

²⁷ Anderson Irrigation & Eng. Serv. Ltd. 2012 (a), p. 10

²⁸ Anderson Irrigation & Eng. Serv. Ltd. 2012 (a), p. 28

²⁹ Anderson Irrigation & Eng. Serv. Ltd. 2012 (a), p. 28

³⁰ Anderson Irrigation & Eng. Serv. Ltd. 2012 (a), p. 27, p. 48

³¹ Anderson Irrigation & Eng. Serv. Ltd. 2012 (a), p. 15

³² Anderson Irrigation & Eng. Serv. Ltd. 2012 (d).

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