

Myanmar Agricultural Development Support Project

Social Assessment

**Ministry of Agriculture and Irrigation
The Union Government of Myanmar**

Draft for Public Consultation

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Lists of Acronyms

ACC	: Agricultural Coordination Committee
AE	: Assistant Engineer
DOA	: Department of Agriculture
DO	: Direct Outlet
DY	: Distributary canal
EMPF	: Ethnic Minority Planning Framework
ESMF	: Environmental and Social Management Framework
FAO	: Food and Agriculture Organization
FGD	: Focus Group Discussion
FS	: Feasibility Study
GAD	: General Administrative Department
GAP	: Good Agricultural Practices
ID	: Irrigation Department
IPM	: Integrated Pest Management
JICA	: Japan International Cooperation Agency
LRD	: Land Record Department
M & E	: Monitoring and Evaluation
MADB	: Myanmar Agricultural Development Bank
MC	: Main Canal
MOAI	: Ministry of Agriculture and Irrigation
NPT	: Nay Pyi Taw
PMU	: Project Management Unit
RPF	: Resettlement Policy Framework
SAE	: Sub-Assistant Engineer
SA	: Social Assessment
SLRD	: Settlement and Land Record Department
UNDP	: United Nations Development Program

VERP : Village Elderly and Respected Persons (*Yat Mi Yat Pha*)
VTA : Village Tract Administration
WUG : Water User Group

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Executive Summary

Executive Summary

Overview of irrigable areas of the regions studied

The main livelihood of the irrigable areas of three regions studied (Sagaing, Mandalay and Bago) are paddy farming despite that Sagaing and Mandalay regions contain significant portion of dry land farming which mainly includes such crops as sesame, peanuts, green gram, cotton and chickpea. The irrigable area of each region covers 1/3 to 3/4 of the total agricultural areas. About 60% to 80% of the total population in each region lives in the irrigable areas.

The irrigable areas of all three regions are generally located where the ethnic Bamar are the majority. However, some other ethnic peoples could be found in some of the townships as separate community. Areas near Chin State in Sagaing region, eastern and north eastern parts of Mandalay Region, and western, northwestern and eastern parts near the Sittaung River are the areas where other ethnic people such as Chin, Shan and Karen could be residing as separate communities.

Farming systems and farming techniques

Generally, two main types of farming system are found in the studied villages of the four schemes: *Le* (paddy) only system, and the system where *Le* and *Ya* (rain fed upland crops) coexist¹. Villages in two townships - Yaetar Shay (East Bago) and Sint Kue - focused more on paddy farming and the other two townships - Tat Kone (Southern Mandalay) and Pale (Southern Sagaing) - have the mixed system of *Le* and *Ya*. Villages in the latter two townships also have a significant number of farming households who only own *Ya* land.

The average land holding sizes of small, medium and large farmers, as locally defined, are 2–4 acres, 5-8 acres and 10–17 acres, respectively. Villages in Pale township (southern Sagaing) is the area where the land holding size is the largest while it is the smallest in Tat Kone Township (Southern Mandalay near Nay Pyi Taw).

Generally, 43% of the villages have two crops annually, 36% grow three crops and the remaining villages only grow one crop per annum. Villages with two crops mainly double-crop paddy – in monsoon and summer, while villages with three crops grow additional field crops such as sesame, beans, peanut and sugar cane. Those villages growing two-three crops have good water availability while those with only one crop have poor availability of irrigation water.

Larger farmers are able to grow more diverse crops simultaneously than small and medium farmers. Given that large farmers have two to five times of land more than medium and small farmers, they grow one crop while the other crops are at the stage of nurseries or seeds for the next season are being

¹ Explanation on *Le* and *Ya* farming is found in Section 2.

produced. For example, the study found that large farmers in those villages with *Le* and *Ya* combined farming system grow six types of crops per year while small and medium farmers in the same villages have a half number of types. Accordingly, large farmers are more resilient to climatic variations and price fluctuations.

***Le* type farming system is more mechanized than *Ya* type farming system.** The power tiller is not suitable for *Ya* lands which is not flat. For harvesting, all regions except three villages mainly used human labour. Two villages in Yaetar Shay (Bago East) are seen using big harvesters through the private services while the other one in Sint Kue used small harvesters. Still many small farmers only depend on their own labor for harvesting. Most of the farmers in villages in three areas (Yaetar Shay, Tat Kone and Sint Kue) use threshing machines. The villages studied in Pale Township, however, are still using human labour for threshing because threshing machine breaks the stalks of paddy plants and the straw could not be used as cow feed as a result.

Majority of farmers in villages studied still largely maintain traditional planting methods. However, villages in Tat Kone Township use 'Rope Line Method' promoted by the agricultural department. Farmers maintain traditional methods despite that they know about the new planting method because this, in their perception, has many specifications. Laborers also do not want to use this method for the same reason, and hiring farmers have to pay more if they want laborers to apply that method.

Labour is short in most villages in all four areas studied except those villages with bad water availability. It is found that 50% villages are being faced with significant labour shortage and all of them have good water availability. Labour shortage has been more obvious in Yaetar Shay and Tat Kone since five years ago because of the migration.

Agricultural extension services are not accessible to most of the villages studied. The services usually reach only to main tract villages. In Sint Kue and Yaetar Shay, the services do not reach regularly even to main tract villages. Insufficiency of technical staff and budget for field visits are the main hindrances. Successful outreach of extension is observed in villages in Tat Kone township which benefit from the presence of agricultural outposts where department in-charge (department manager) comes frequently while 7 to 8 agricultural extension workers are visiting fields every day. They give advice in response to farmers' need and give agricultural training three times per season to both farmers and the labourers (*Thoke* group members).

Peer-to-peer learning especially learning from large farmers is a key to disseminating new techniques, especially new seeds. Most of the farmers grow new seeds when they see good results on the fields of other farmers who in most of cases are large farmers with at least 10 acres of farmlands. They can afford to test new seeds on a small portion of their land, say one acre. 'Model farmers' were found in some villages: they are large farmers owning 10-40 acres and tend to be influential figures such as village elderly and respected persons or educated persons. Those people have exposures dealing with institutions outside the village, especially with government departments and the Yaesin Agricultural University where they purchase new seeds.

Traders are also effective disseminators of new seeds to farmers. Some farmers say they have more confidence to grow new types of paddy recommended by traders because they believe that the type of paddy recommended by traders will be good in market demand. Regarding usage of fertilizers and pesticides, farmer mainly try methods recommended by input market suppliers.

Majority of farmers use improved rice seeds. There are three main types of sources from which farmers access to seeds in all villages studied. They are: seed distributors especially large farmers in the areas, the government nursery distributors and farmers in the same village. The first type of the source of seeds is large farmers using seeds from the Yesin Agriculture University. Government nurseries exist in township cities and are mainly depended by larger farmers and the village level seed distributors. The third type of seed distributors - farmers in the same the village - are those large farmers who use first generation seeds from the township nursery or private shops in main cities, who resell to fellow farmers who mostly are medium and smaller farmers. This means that larger farmers are more accessible to better seeds than medium and small farmers.

Private dealers are main distributors fertilizers at townships and villages. Large farmers usually purchase directly from the township dealers on installments with no or a low interest rate while medium and small farmers purchase from village dealers on credits with 7-10% interest rate. In fact, large famers in many cases are the village level dealers of fertilizers who mainly sell to smaller farmers.

The products are purchased directly by brokerage houses and rice mills in all villages visited. Only exceptions were beans and sesames in villages of Pale Township which farmers have to sell at the township market. The study found that in villages with good water availability where socioeconomic condition is good, large farmers are seen as product buyers and traders who purchase products at the harvest time, store at home and sell when they get most favorable price.

Land

Land user certificates (LUCs) are being issued as one of the subsequent actions of the 2012 Farmland Law. Farmers are entitled to transfer the user rights or use them as collateral in borrowing official loans according to the new law although the state still is the ultimate owner of the land. **Farmers especially women, however, are found having little knowledge about the meaning and benefits of enhanced user rights under the new law.** They expressed insecurity on their land pointing out the state's ultimate ownership of the land.

Land issues were found in three forms. Land disputes are seen in three types: land disputes related to land confiscations under the military regime in 1990s; land disputes among siblings and relatives; land disputes related to farmland boundaries among neighboring farmers. Another type of land issue is that reclassification of the land types from *Le* to *Ya* or vice versa is needed in several villages. Such disputes are handled by land management committee of different levels.

Farmers who have not had experience with land improvement schemes expressed their interest to participate in such activities. On the other hand, farmers who are already participating in land improvement schemes expressed their concerns which are related to the low quality of works.

Nevertheless, the SA found that land improvement is a very profitable scheme improving product marketing and production efficiency through mechanization. On the other hand, the schemes developed by the government have two main constraints - challenges in land redistribution with the lack of precise measurement before the implementation of the scheme, and quality short-falls with the lack of sufficient budget. In addition, farmers expressed their concerns on mandatory cultivation of “Pale Thwe” paddy, the ministerial policy crop, upon completion of land improvement scheme.

Access to irrigated water

The study found that accessibility of irrigation water is the main determinant to farming systems and that the socioeconomic conditions of villages with good availability differed from those with less water availability. Half of the villages studied only had *Ya* farming before they started benefiting from the irrigation. The rests used to have *Le* farming, but only with one crop of paddy. The former are able to grow both paddy and other crops now, while the latter have been growing two crops of paddy since they have gained access to irrigation water.

Various failures in irrigation system as well as neglect or disobediences of rules and regulations by communities are revealed. These result in a lack of or limited/delayed irrigation water supply despite that each scheme targets much larger areas than what is currently irrigated. The study found several system failures, such as leakages and canals not built to be workable on various topographical conditions or water velocity. And there is a lack of systematic maintenance by the irrigation department. On failures of community compliance to rules, there are three main types: people’ arbitrary use of irrigated water and infrastructure; failures in maintaining water courses; and undisciplined structuring of farmland boundaries.

Social relations are inflicted with competition for irrigated water. There are intra- and inter-village conflicts as people have to compete over irrigated water. Upstream farmers often take water first resulting in shortage of water at downstream. As a result, farmers at medium and tail ends have to go as a group to the village closer to the canal and request to open water ways. Frequently, such situations lead to conflicts in which physical assaults can occur. Intra-village tensions upon acquiring irrigated water are very commonly reported in every village visited. Those problems mainly involve plot-to-plot water distribution and dispute between upstream and downstream users.

Systematic community water management system exists only in 43% of the villages studied. Water user groups in those villages are formed as per watercourse or direct outlet. The water user groups are called *Myang Kaung* groups. The groups are headed by *Myaung Kaung* (canal head) and comprise farmers using a certain DO or watercourse. *Myaung Khaungs* are selected by farmers sharing a water course or direct outlet. *Myaung Kaungs* are seen in effective role in water management in villages where there are systematic water user groups. They organize farmers in their groups to clean or repair watercourses and DOs before a crop season begins. In addition, they monitor water distribution so that all farmers are able to get water as their turns. Usually, *Myaung Kaung* gives penalty to those who violated turns by not giving water for two weeks. The study found that *Myaung Kaung* in villages where there are water user groups are directly communicating with persons from irrigation department, especially with SAEs and that there are close cooperation between the group and ID.

Water tax has not been collected since 2011. The water tax when it was last collected generally was 1,950 Kyat. People have no clear idea on why water tax was not collected for the last three years and some thought it would be collected in sum for three years. On the other hand, people from irrigation department said that it was people's failures to pay taxes.

Vulnerability

Amounts of debt are higher than before. However, farmers in good water availability are able to repay their loans which explain the lower interest rates charged by moneylenders. On the other hand, villages with poor water availability are difficult to repay and found to be resorting to such coping mechanisms as migration and land selling.

More migration has been taking place in almost all villages regardless of situations of irrigated water availability. However, the nature of migration seemed different among villages with good and bad water availability, which is the key determinant of people's socioeconomic conditions. The study surmises that people in villages with good water availability tend to migrate for capital- and skill-intensive works while those in bad water availability go for labor intensive works.

The landholding size, and corresponding household wealth status, still determines price. Larger farmers can afford to store their product until the price goes up in the market or at least paddy grains are dried enough while the small and medium farmers cannot do so.

Two main types of vulnerability groups are found by SA as groups who could be covered by the project.

1. Small farmers especially women headed small farmers with less than four acres of land in bad water availability villages;
2. Small farmers who make share cropping in poor water availability villages

Gender

The average number of female headed household (FHHs) in villages studied are 16, which is 6% of the average population. However 5% are considered as most vulnerable as they are small and landless families. Villages where capital and skill intensive migrations are higher, incidence of women headed households is also higher.

Gender division of labour in farming works has faded in all areas because of the labour shortages. The study found that women have to take more and new roles in farming because of labour shortage and migration of men. It is also found that women get the same wage as men for the same type of works.

Women are not found in key institutions and decision making roles of the community. The study revealed that women are not seen as members of such key village institutions as village administration, village development supportive committee, village land management committee. A few women are seen as members of water user groups but no woman is seen as the leader. Women are seen as leaders of the labour groups called *Thoke* groups.

SA also found several cases of migrations' negative social impacts particularly in terms of separated families and increase of women headed households. Given that more men migrate and, if they do, they migrate further and longer than women, it happens that they settle their lives in the destination places by developing new marriages. Researchers have seen several cases of women headed households being inflicted by this phenomenon.

Results of free, prior and informed consultations with villagers

Renovation of the Irrigated canals and building watercourses

People in the villages studied generally welcome rehabilitation of the irrigation canals regardless of farming types and ethnicity. Most of the people recommend lining of the canals (in bricks and concrete). More importantly the study revealed that small farmers especially those 2 acres and less unlike other farmers have concern on giving up land when water courses are built. However, some villagers including VERPs and administrators mentioned that the canal maps were already drawn, which describe watercourses and canals. This is also acknowledged by farmers, and that there will be no problem building water courses or enlarging the canals according to the design.

Laborers in the village also welcome the scheme pointing out that they can have more job opportunities when large farmers benefit. Laborers in villages with limited water availability are expecting to have more jobs through rehabilitation of the canals by the project.

Right of Way

Almost all farmers who are growing crops there said that they will remove crops from the area when the canals are renovated. People generally acknowledge the right of way, but do not know the exact areas. Persons from land record department also stated that the land entitlement given to the farmers excluded the canal areas.

Land Improvement Schemes

People generally know that land improvements benefit them by developing a structure with more accessibility to markets and enabling mechanized farming, which will result in more efficient production. However, people who participated in completed land improvement schemes reported challenges about the schemes: the quality of the scheme especially on land leveling, product roads and canals is not good enough to grow crops or utilize; and disputes could arise on redistribution of land after implementation of the scheme.

People opinion on provision of farming technique

Every method and seed which will have high yields and good in market demands will interest farmers. Farmers insisted that they are interested in testing new methods which are not financially costly and not particular in activities. Some large farmers are willing to do demonstration or field testing on their plots. Small and medium farmers however expressed that they are not willing to take a risk of testing new seeds or methods and that they will adopt depending on the results of the large farmers' fields.

On learning and knowledge sharing, farmers largely prefer methods which combine practical and theoretical sessions. They highlighted that they wish to have demonstration plots in their own villages. Regarding locations of training, most of them proposed using existing community buildings such as “Dama Yone” (socio-religious places for Buddhists), monasteries and schools. People generally prefer the former two to schools as they have more sense of community ownership over them. Some respondents in three villages said that they could arrange space for building training schools in their community owned space. Some in two other villages recommend renting a space for training. But no one seems willing to offer or donate their private space or request others to donate theirs for the purpose.

Recommendations

Participatory irrigation management

Roles of Water User Groups and ACC are important for successful participatory management of irrigation structures. In order for WUGs to be truly represented by all farmers as well as vulnerable ones, the leaders of the groups need to be elected by the farmers using water. A bylaw or ‘constitution’ will need to be developed to facilitate community management of irrigation water and minimize disobedience with clearly agreed rules on: membership of WUGs; elections of water users groups; the roles and responsibilities of members and leaders of WUGs; compensation for the leaders; the penalties for breaching the rules of the WUGs; resource pool and management; decision making; complaints mechanism (intra groups and regarding with the service providers); communication channels with service providers; information giving mechanisms and record keeping. In addition, mechanisms on decision making and complaints handling need to be carefully laid out especially from the viewpoint of inclusion of vulnerable farmers.

ACC is very fundamental for the success of the project and its sustainability. ACC will have to play a focal role bridging the service providers and the people. It is recommended that all WUG leaders in every village participate in regular meeting with sub-ACC held at the outpost offices so that the voices of the people are to be heard and responded. Capacity building and civic education targeted at both the people and the service providers are essential for the long term success of the project.

In order for the project to be inclusive and responsive, **capacity building component is essential.** The capacity building is to be targeted at both service providers and the farmers. For the service providers, such concept as social inclusion, gender and accountability are to be provided. On the other hand, the people (members of WUGs) are to be provided with education on Land Laws and Irrigation Laws, concept of social inclusion, gender, leadership, record keeping and basic financial management and so on. For trainings especially for the community, it is strongly recommended to use simplified literatures.

Rehabilitating canals and watercourses

Obtaining farmers’ agreements to remove crops on the Right of Way will not be difficult, but a **participatory process possibly facilitated by a civil society organization will be most effective.** One important thing recommended by some VERPs is to carry out the work through organizing people. This

means despite that people acknowledged about the canal areas, they do not wish their crops to be removed by force but by soft ways, such as explaining about the project and its results. Such approach can be better facilitated by some civil society organizations which are skillful in organizing the community through participatory methods.

The scale of land loss for rehabilitation should be done equitably for the sake of vulnerable farmers, particularly for those with one and less than one acres of farmland.

Extension Services

Theoretical and practical learning methods should be applied. More importantly, **people's most suggested learning technique is learning while taking actions to the problems they are faced with in reality.** In order to fulfill this need the service providers need to be sensitive and closely in touch with the community.

As SA found the gender based division of labor is much reduced, it is highly recommended to provide women laborers with training on how to use and repair farm machineries.

It is recommended to conduct assessments on the types of seeds that farmers use and prefer in specific locations so that the seeds department of MOAI could effectively support the types of seeds relevant to the preferences of farmers in different areas. SA also recommends that timing of training should be consulted with the people.

Farmers' awareness on benefits of growing cash crops should be enhanced as access to water improves and opportunities for diversification open up. Potential crops, such as onion, chili and other vegetables, should be explored.

Land improvement schemes

SA recommends efforts to ensure quality work in order to make such schemes successful and acceptable to farmers. **Participating farmers would need to be convinced of the quality before implementation starts.** Precise measurement of land before implementation is also important and participation by farmers in such exercises by the SLRD is recommended.

Applying the same portion of land deduction to construct product road and canals regardless of the holding size would not be acceptable to smallholders and may lead to conflict and tensions. Measures to find 'fair' distribution of land losses which is acceptable to the community need to be sought. Consideration to exempt small farmers from application of the same proportionate reduction may be considered.

Community consensus building on land improvements may require support by third-party entities, such as civil society organizations, with experience in community mobilization and facilitation.

Section 1: Introduction

1.1 Project

The Government of the Republic of the Union of Myanmar requested the World Bank to support irrigation development. In response to this, the World Bank has conducted scoping missions and several discussions with the Ministry. It has been proposed that a project called Agricultural Development Support Project will be implemented by the Ministry of Agriculture and Irrigation with the technical and financial support of the World Bank and other international and local development partners.

The objective of the proposed project is to increase crop yields and cropping intensity in the selected existing irrigation systems in Bago East, Nay Pyi Taw, Mandalay, and Sagaing regions through the improved irrigation and drainage management and complementary farm advisory and technical services. The proposed project will be composed of four components of activities:

Component 1: Irrigation and Drainage Management

The component aims to enhance responsive and reliable provision of irrigation and drainage services in the project areas to enable an increase in irrigation area coverage, a resulting better farm productivity and better distribution of benefits between upstream and downstream users. It would address irrigation and drainage management through the following approach.

The component will support the development of irrigation and drainage management institutions, their human resources, data collection and management information systems and infrastructure. It will also support the development and strengthening of the existing Agriculture Coordination Committee as stakeholder planning and decision making platform for irrigation management for farmers and service delivery agencies. Moreover, the project will support the establishment and development of about 280 WUGs in 8 irrigation sites, potentially utilizing facilitators from civil society organizations. Capacity building of service delivery agencies at all levels, including WUGs, will be provided. Facilitators will be trained in development of WUGs and creation of bridges between farmers and government agencies. WUGs and agency officials will be trained in new technologies and management approaches for improved service delivery and scheme management. In order to facilitate better information sharing and more reliable provision of irrigation and drainage services, the project will also strengthen the management capacity of the Irrigation Department of MOAI through provision of management information and decision support systems, improvement of infrastructure and facilities and enhancing mobility of field staff.

The component would also finance the improvement and rehabilitation of irrigation and drainage infrastructure covering about 40,000ha within 8 selected schemes in four selected regions (Sagaing, Mandalay, Nay Pyi Taw and Bago East). It would finance rehabilitation and improvement of main conveyance, flow control and sediment management systems and de-siltation of irrigation and drainage systems and dam safety enhancement measures. The project would also support development of on-farm water management infrastructure and pilot land improvement in 2-3 selected systems, which is

needed for creating cropping flexibility for the farmers and ending their mutual dependence which exists in the traditional field (and plot to plot) water conveyance systems. The project would strengthen SLRD's capacity and the existing processes to improve land certification in the pilot land improvement sites. The infrastructure rehabilitation investments will be based on special studies targeted at the selected irrigation schemes. These could include, *inter alia*, feasibility studies, environmental and social assessments, options for private public partnerships and improved cost recovery, performance assessment benchmarking and scheme management improvement potential, asset management, disaster risk management, dam safety and drainage master planning.

Component 2: Farm Advisory and Technical Services

This component seeks to enhance MOAI technology development and farm services at target townships which host selected irrigation schemes to improve farmer crop choices and increase farm productivity. An improvement of the selected irrigation schemes under Component 1 will result in increased water availability and improved water control. The production and extension of improved technologies and agronomic practices supported under Component 2 will enhance the economic and financial viability of farming systems on these schemes. Farmers will have the capacity to improve cropping intensity and where feasible diversify from growing rice to more water efficient crops such as legumes, oil seed crops and vegetables. Increasing awareness of costs and benefits of improved varieties, good seed, and upgraded fertilizer recommendations to take advantage of improved water conditions will also raise productivity as will the introduction of other agronomic and farm mechanization practices. These technologies will need to be adapted to the new agro-ecological environments in target irrigation schemes and then extended to farmers.

The component would also support technology development and adoption activities in targeted irrigation schemes (e.g., public goods), which would increase farm productivity and reduce production costs of farming systems. It will build on the existing public extension system, which is relatively well staffed but lacks operational funds, knowledge in modern technologies and farm practices, and interaction skills with farmers. Functionally, it will support quality seed production (mainly non-hybrid rice, beans and pulses, and oil crops that are not produced by private sector) by developing farmer-based seed multiplication infrastructure and facilities and strengthen seed supply chains. This will foster improvements in varietal development, on-farm seed multiplication, and distribution of improved seed to farmers. Improved fertilizer applications which will be adopted to the variability in soil types in targeted irrigation schemes are expected to increase yield response rate to appropriate nutrient applications to reach full potential of new varieties, while reducing fertilizer costs. The potential risk of crop losses due to insect pest and disease outbreaks will be addressed by improving the capacity of the MOAI and farmers to protect both public health and the environment through the adoption of Integrated Pest Management (IPM) techniques based on the specimen problem identification collections of pests in projects townships. All these agricultural technology development activities and knowledge of improved farming practices will be disseminated to target farmers through improved farm advisory services which are based on farmers' needs and technical constraints, farming systems and market opportunities. The project will support rehabilitation of village extension education centers,

establish field demonstration sites of improved technologies, expand training programs and provide operational and mobility support to MOAI extension staff and subject matter specialists.

The component would also support training of MOAI mechanics, test and demonstrate new climate-smart technologies suitable for smallholder farming systems, and provide mechanization services in the target irrigation systems. It would upgrade the capacity of the Meikhtila Mechanization Training Center in Mandalay region through introduction of the modern training methodologies, materials, and upgrade repair workshops, in order to provide more and better vocational training to the staff of MOAI Mechanization Service Stations, farmers, and private sector. It will also support four MOAI Mechanization Service Stations in the project areas, through procurement of machine packages and mobile repair workshops selected in collaboration with the private sectors in order to promote climate-smart mechanization technologies to farmers, provide cost-effective services suitable for smallholder farming systems in Dry Zone, and carry out farmer training.

Component 3: Project Coordination and Management

The Project Management Unit (PMU) will be established. It will include technical and fiduciary MOAI staff who will be seconded to PMU at a full-time basis from the relevant implementing departments. The implementation of individual project components and sub-components is being carried out through departmental Project Implementation Units. The PMU will be responsible for the overall coordination of the project implementation and fiduciary arrangements, including procurement, financial management, management of safeguards issues, internal and external auditing and the establishment of the project Monitoring and Evaluation (M&E) system. Outside consultants will be recruited in areas which require strengthening of MOAI implementation capacity. The component would finance establishment of the M&E and Management Information System and associated Technical Advisory (TA) services; communication and consultation program; salaries of the externally recruited staff, related office equipment and mobility.

Component 4: Emergency Contingency Response

The objective of this zero component is to allow a rapid reallocation of loan proceeds from other components to provide preparedness and rapid response support to disaster, emergency and/or catastrophic events as needed.

1.2 Objectives of the SA

This Social Assessment (SA) was conducted as part of the project preparation in order to: (1) collect and analyse socio-economic data and information about the project's potential beneficiaries and the people who may be negatively affected by the project to provide recommendations to maximise benefits to a broad spectrum of beneficiaries and minimize and mitigate negative impacts that may occur; and (2) assess situations and recommend actions in relation to two World Bank social safeguard policies

(Indigenous Peoples and Involuntary Resettlement)². The findings and recommendations of the Social Assessment will inform key designs in relation to beneficiary participation and inclusion. They will also help identify and formulate specific actions and implementation arrangements with regards to social aspects which would be incorporated in identification, screening and processing of irrigation scheme proposals under the programmatic approach of the project. As such, it provides inputs to the Resettlement Policy Framework (RPF), Environmental and Social Management Framework (ESMF) and Ethnic Minority Planning Framework (EMPF).

This SA assessed four irrigation schemes that have been pre-identified that may be rehabilitated under the project. These four irrigation schemes were selected because they demonstrate many characteristics typical of the irrigation schemes in the three regions³ that have been selected as project target regions. The socioeconomic, demographic and other relevant information about the four schemes are therefore considered useful and relevant for any irrigation schemes that may be selected during project implementation from within these regions. The project may rehabilitate any of these four schemes if its feasibility is ascertained under a Feasibility Study (FS), to be conducted during the implementation, based on a more detailed assessment of associated economic, technical, environment and social issues. A full Social Assessment will be conducted as part of the FS in line with the World Bank Operational Policy 4.10, if an ethnic screening to be conducted during implementation as per EMPF finds ethnic minority communities are present in the area of influence of the irrigation schemes to be assessed under FS.

1.3 Methodology

The study mainly applied qualitative research methods. The SA applied such qualitative data collections tools as literature review, focused group discussions, key informant interviews and self-observations. In addition, the irrigation resources mapping exercise were also used in order to understand the people's point of view on realities of current irrigation schemes. The case studies are also applied to reflect the general and specific findings of the study.

The study first assessed the broad socioeconomic, demographic and other relevant characteristics of the three project regions, and against the background collected the relevant information in the "irrigable areas" within the three regions. The irrigation schemes to be rehabilitated under the project will be located within the "irrigable areas" which thus broadly constitute the potential project areas. The study carried out an in-depth assessment of the four irrigation schemes which, as mentioned above, demonstrate many characteristics common among the irrigation schemes in the study regions.

² The two social safeguard policies are available on the following sites: OP 4.10 (Indigenous Peoples) <http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTOPMANUAL/0,,contentMDK:20553653~menuPK:4564185~pagePK:64709096~piPK:64709108~theSitePK:502184,00.html>; and

OP 4.12 (Involuntary Resettlement) <http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTOPMANUAL/0,,contentMDK:20064610~menuPK:4564185~pagePK:64709096~piPK:64709108~theSitePK:502184,00.html>

³ Sin Thay irrigation scheme is located in Nay Pyi taw council which is administratively separate from but is similar in demographic, socioeconomic, topographical and other relevant characteristics to Bago East region.

1.3.1 Sampling

The unit of analysis for field data collection is the villages within pre-identified schemes which are selected in coordination with key stakeholders, the MOAI, the World Bank and the FAO⁴. The four pre-identified schemes are: Sin The (Tat Kone Township in Mandalay Region), Swa Chaung (Yaetar Shay Township in East Bago), Male Nattaung (Sint Kue township in Mandalay Region) and North Yama (Pale township in Sagaing Township) were selected for preliminary social assessment based on their regional socioeconomic and geographic differences.

Regarding with the community level field data collection, 3 villages of each study scheme were selected as per their distances to the main irrigation sources as the water availability generally differed based on the distances of the main irrigation sources with a view to obtaining comparable sets of socio-economic information which is influenced by access to irrigation water. Accordingly, one village close to the main canal, one from medium distance to the main canal and the other one from the tail of the main canals are selected. In addition, the two villages from Sin The irrigation scheme and Swa Chaung irrigation schemes were visited as place for undertaking pretest. As a result, the SA visited 14 villages for community field data collection. Two social assessment field data collection teams made two days field consultation visits in 14 villages under four irrigation schemes in three regions.

1.3.2 Free, prior and informed consultations as part of the SA

As part of SA, free, prior and informed consultations were carried out at the village level with farmers with a different size of land ownership, landless labourers, women head households and village leaders. SA team met village formal and informal leaders who included village tract administrators, hundred household leaders, Myaung Kaung (leaders of water user groups) and village elderly and respected persons. More importantly, the team also met some ethnic and religious minority groups. As will be mentioned below, there are not many ethnic minorities in the potential project area, however, a free, prior and informed consultation was conducted with Shan ethnic group who live in the potential project areas. In addition, the Karan Language and Cultural Associations and leaders of Civil Society Organizations representing Chin people were consulted to seek for information about Bago and Sagaing regions where Karan and Chin ethnic people are present.

1.3.3 Number of respondents

Over 335 people at the village level were met during the community field data collection. Of which 20% are female respondents. At the township level 15 persons from four key stakeholder government departments mentioned above were interviewed.

1.4 Limitations of the works

Time limitation

The biggest limitation of the study is time limitation particularly in field data collection particularly in the township level field data collection. The field data collection in each village acquired only two days while it is only one day for the township level. Given that the township level State actors tend to have unexpected working agenda and they cannot give time well enough for the SA teams. The village level

⁴ The SA was conducted under a contract with FAO, which also provided technical support.

data collection also in fact not enough time especially for those villages which grow summer paddy and early monsoon crops. As people were occupied with their farm works the time they could give the SA team teams was only early night time. However, it is not that convenient for doing FGDs in the night time with the lack of sufficient light. In addition, coordination with township level authorities to obtain permission for village visits sometime required additional time and efforts.

Difficulties in acquiring demographic data from village administration office

It was experienced in a couple of villages that demographic data could not be acquired from village tract administrators as the data were not kept by the village tract administrators but only at the hands of tract administrative clerks who do not live or absent at the time of the field data collection. In fact, copies of the data should also be kept at the village administrative office which does not exist in most of the village tracts. Accordingly, if the village administrators are the one who are active and interested in village affairs they keep data and if not the data tends to be only at the hands of tract administrative clerks.

It was suggested that a full Social Assessment should be conducted during implementation when project irrigation schemes and pilot land improvement sites are identified according to the requirement of OP 4.10, *Indigenous peoples*.

Section 2: Legal, Policy and Institutional Framework

According to official estimates, the population of Myanmar reached almost 60 million in 2010. The Bamar is the largest ethnic group, comprising around two-thirds of the population, and various ethnic minorities accounting for about one third. The majority Bamar population mainly lives in the central and delta regions (divided into seven Regions) while the ethnic minorities live mainly, however not exclusively, in the seven States (Kayah, Kayin, Kachin, Chin, Mon, Rakhine, and Shan) along the borders. The official population estimates of the main ethnic minority groups are roughly: Shan (9%), Kayin/Karen (7%), Rakhine (4.5%), Chin (2%), Mon (2%), Kachin (1.4%), Kayah (1%). The eight “ethnic races,” including the majority Bamar, are subdivided into 135 officially recognized ethnic groups and belong to five linguistic families (Tibeto-Burman, Mon-Khmer, Tai-Kadai, Hmong-Mien, and Malayo-Polynesian); there are no population figures for ethnic minority sub-groups.

According to Chapter 1, clause 22 of the 2008 Constitution of Myanmar, the Union Government of Myanmar is committed to assisting in developing and improving the education, health, language, literature, arts, and culture of Myanmar’s “national races.” It is stated, that the “Union shall assist:

- To develop language, literature, fine arts and culture of the National races;
- To promote solidarity, mutual amity and respect and mutual assistance among the National races; and
- To promote socio-economic development including education, health, economy, transport and communication, [and] so forth, of less-developed National races.”

The constitution provides equal rights to the various ethnic groups included in the national races and a number of laws and regulations aim to preserve their cultures and traditions. This includes the establishment of the University for the Development of the National Races of the Union which was promulgated in 1991 to, among other things, preserve and understand the culture, customs and traditions of the national races of the Union, and strengthen the Union spirit in the national races of the Union while residing in a friendly atmosphere and pursuing education at the University.

There is no central government agency with the responsibility for addressing particular issues pertaining to ethnic minorities. The vast majority of Myanmar's ethnic minorities live in the seven States and these are in most cases led by the main ethnic minority in the respective States. In relation to previous ceasefire agreements, ethnic minority groups were granted authority over political and economic affairs in their areas, covering large areas of the States. Social and other public services were developed by ethnic authorities, often with support from NGOs, and are still operating in many areas.

Under the current government, free media is developing and ethnic parties and associations are politically active. Ethnic minority organizations may also play a stronger role going forward through the current Government's decentralization efforts which would afford States and Regions to play a more prominent role in decision-making and implementation of various policies and programs.

Section 3: Sector Framework

Myanmar is an agricultural country and agriculture sector contributes 30% (2010-2011) of GDP; 13.7% of export earning and employs over 60% of the labor force⁵. One of the major economic objectives is "to build the modern industrialized nation through the agricultural development, and all-round development of other sectors of the economy". In addition, agricultural development has been undertaken since 1992-1993 by developing integrated development strategy generates the following policies_ almost all of which are relevant to main themes of proposed project.

- 1) To emphasize production and utilization of high yielding and good quality seeds.
- 2) To conduct training and education activities for farmers and extension staffs to provide advanced agricultural techniques
- 3) To inculcate agricultural knowledge into primary and secondary level students
- 4) To spawn qualified agricultural technicians from State Agricultural Institutes and Yezin Agricultural University
- 5) To implement research and development activities for sustainable agricultural development
- 6) To protect farmers' rights and benefits
- 7) To assist farmers to get fair price on their produce
- 8) To assist in reduction of production cost, increasing high quality crop production, strengthening and developing the market infrastructure
- 9) To encourage transformation from conventional agricultural to mechanized agriculture

⁵ Myanmar Agriculture in Brief 2012. MOAI

- 10) To undertake renovation and maintenance works for old irrigation, pumping and underground water systems
- 11) To support rural development and poverty reduction activities through development of agriculture sector
- 12) To help strengthen the market and allow the farmers freedom of choice in crop cultivation
- 13) To encourage local and international investment in agriculture sector
- 14) To appropriate and amend the existing agricultural laws and regulations in line with current situations

The proposed project will be providing support in realization of policy numbered 1, 2, 6, 8, 9,10 and 12. In addition, the social assessment carries information and recommendation on the above mentioned points of agricultural development policies. Since the proposed project has embedded the theme of community based implementation and inclusion, the policies of the ministry will be realized with inclusive people's participation, transparent and informed manners.

Section 4: Geographic, Demographic and Socioeconomic Backgrounds of the Potential Project Areas

The three regions Sagaing, Mandalay and Bago is the home of nearly 21 million people constituting 35% of the total population of the country. The three regions are economically very significant for Myanmar as they are producing agricultural goods commercially and agricultural markets are developed in all three regions. The main agricultural products of Sagaing and Mandalay are similar producing paddy, peanuts, peas, sesame, cottons, mangos while Mandalay is producing more vegetables where as Sagaing is producing more wheat. Bago on the other hand is mainly producing paddy, sugarcane and such perennial as Duran, Magosteen, Rambutan fruites.

Several farming types are seen in three regions: Le, Ya, Kaine, Ma Yae Lae and garden lands. However, Sagain and Mandalay have more "Ya" land, Kaine and Mayae land than Bago which on the other have more Le land. In fact, the two regions especially Sagaing possess more Le land only after the irrigation schemes constructed between 1990s' and 2000s'. The two regions before mainly focused on Ya farming. Now the areas of Southern part of Sagaing become the exporter of one of the World's best quality rice which locally called as "Shwe Bo Paw San".

"Le" is generally wet, muddy and flat lands on which paddy mainly has to be grown. In Myanmar those land which is recorded as Le land by the land record department are to be utilized only by growing paddy. Le lands especially are located in the zones of good rainfall. Ya generally could be considered as dry land in areas on hilly landscape. Given that areas where Ya land located are arid and semi-arid regions with insufficient rainfalls to grow paddy. Accordingly, the Ya grows such crops as peanuts, sesame, peas, cotton and corn. "Kaine" and "Ma Yae" is seasonal farming on the silted land in the river. Kaine however is more sandy and thus growing such vegetables as onion, tomatoes and chili. On the other hand the "Ma Yae" farmlands in fact as the wet silted land on the river banks where people mainly grow paddy in the latter monsoon season one the tide recedes.

4.1 Sagaing Region

Sagaing Region is situated middle and north-west of Myanmar between latitude 21 degree 30 minutes north and longitude between 95 degree 37 minutes east. Its total area is wide 935271km² (36111 sq miles). The region is located between the Ayeyarwaddy and Chindwin River. Its northwest part shares

No	Stations	1981	1991	2001	2009
1	Katha (Northeast)	1269	1332	2087	1369
2	Mawlaik (West)	1465	1880	1566	1371

border with India. The region's population is 6,541,000 of which 5,360,000 are resided in rural and 1,230,000 in urban. The population could be divided by gender as 3326000 female and 3215000 Male⁶. Population density is 177 per square mile. Sagaing is composed of 8 districts: Kalay, Tamu, Mawlite, Kam Tee, Kathar, Sagaing, Monywa, Shwe Bo.

Sagaing is a region of topographical varieties possessing mountains, plains and valleys. There is a 10000 feet Patkwaing mountain range and 8000 feet high Naga mountain ranges lies at its border with India. In addition to those mountain ranges, other mountains such as Minwum, Ponnya and Phoe Win and so on are laying at different parts of the regions. There also three rivers laying across the regions making its famous fertile Shwebo, Homlin plains and such valleys as Myittha, Monywa-Pale, Kabaw, Meza and Katha. The climate of Sagaing region can be differentiated into two: arid and hilly climate. The average annual rain fall of the region is 1780.6mm⁷.

Table 1: Average Rainfall (mm) in Sagaing Division over the last four decades

⁶Myanmar Statistical Year Book 2011

⁷ Myanmar Statistical Year Book 2011. The data is the average annual rain fall of five weather stations of the region located in Katha (North east), Mawlite (West), Monywa (the South, west coast of Chindwin River), Shwe Bo (the South, west coast of Ayeyawaddy River) and Kam Tee (the North).

3	Monywa (the South ,west coast of Chindwin River)	797	519	462	498
4	Shwe Bo (the South , west coast of Ayeyarwaddy River)	2152	749	646	748
5	Hkamti (the North)	3004	5746	3351	3086
	Average (mm)	1737.4	2045.2	1622.4	1414.4

Sagain region is a region with ethnic varieties residing such ethnic groups as Bamar, Shan, Naga, Chin and Gadu and Ganan. In terms of ethnic distribution, the region could be divided into four parts: The north, the north east, the South and the west. The North and the West part of the region are largely occupied by Naga group and part of which are shared with Chin people. The North east are resided by Shan and Kachin ethnic groups which however are somewhat assimilated with the Bamars in the South. In Sagaing region there are 9.3 million acres of sown farmlands in 2009 which increased from 3.5 million acres in 1988. . The region in fact used to be a water scarcity area before 1988. As a result, the region at that time only had “Ya” farming growing oil crops and beans. However, the region become one of the areas producing rice significantly after since the mid 1990’s because of the government’s dams, river water pumping and underground water pumping schemes_(See water data by states and regions in the country over view).

As a result of the water schemes for agriculture, the Southern parts of the region have experienced changes in its farming system from “Ya” focused to “Le” focused system. In addition to this major change of farming system, it has more crop intensity from two crops to three crops. The multiple cropping acres before 1988 is 0.55 million which increased to 4.1 million acres in 2009⁸.

In terms of agro ecological zone, the region basically could be divided into two parts: The hilly north and west; and the plains and the valley of the east, south and the middle. The hilly north and west where Naga and Chin ethnic groups are largely residing has three farming types: slash and burning, terrace farming and garden lands (growing perennials). Of the three types, slash and burning is most dominant system where rice, corn and beans are produced. The terrace farming is the second common system where rice is the main product and tangerines and coffee are produced in gardens which occupy only the limited area of the region. The production in this hilly part of the region is not commercial because of the very limited market accessibility.

Table 2: The 8 districts of the regions by its agro-ecological zones

Districts	Agro-ecological zones
Kalay	Hilly west

⁸ Chronicle of National Development: Comparison between Period Preceding 1988 and after (up to 2009), Ministry of Information

Tamu	Hilly West
Maw Lite	Between hilly west and the Chindwin (River valley)
Khan Tee	Hilly North
Sagaing	The South
Mon Ywa	The South (Monywa-Pale plain/Chindwin river valley)
Shwe Bo	The South (Shwe Bo Plain, Ayeyarwaddy River valley)
Kathar	The east (Kathar river valley/Ayaarwaddy river valley)

Given that the regions plains and river valleys are located main in its east, south and the middle parts, the people mainly are growing rice despite that the areas can be divided into two main categories, rain fed and those farming dependent largely on the government different water schemes most of which are located in southern and middle of the region. So, there regions at least have three crops per year: rice in raining season and such cash crops as peanuts, beans and sesame depending on the market potentials. Some hilly areas and those not benefiting the government water schemes remained to be traditional “Ya” systems where such oil crops as peanut and sesame; and bean relying on the water rain falls and mist. On the other hand most of the eastern part of the region focused on the paddy production being located in the Mu River valley depending on the rain fall which is comparatively higher than other parts of the region.

Sagaing comparing to other areas is not high in poverty level according to the UNDP poverty head count in 2009-2010 by which the average head count of the 8 districts of the regions is 17.98. The region’s national poverty share according to the same data source is 0.87%. The district with highest poverty headcount is Kantee located in the northern part of the region largely resided by Naga people According to the FAO’s “Food Security Assessment Mission to Myanmar 2009 January” report, Sagain is one of the areas with high food security per capita ranking 4 making 624.2 kg per capita. In addition, Sagaing is one of the region with high household crop per holding making 8.51 acres.

However, people in areas in which farming system is “Ya” depending on the rain and natural climate are considered as poor and vulnerable people in the areas. Socioeconomic conditions in those areas are declining because of the frequent crop failures resulted by climatic irregularity occurred more obviously since over several years ago. When we look at the rain fall data of the last four decades, it is clearly seen how people lack of irrigated water especially “Ya” farmers in Monywa and Shwebo are difficult because of the significant rain fall decreased 34% and 65% decreased respectively comparing to the data in 1981 and 2009.

In addition, people in Naga mountains are also considered experiencing both food and cash poverty. According to the poverty head count data of UNDP 2009-2010, Khamti which is a district in Naga areas

has 37% in poverty head count and its national poverty share is 0.52. Given that the area is poor in product market and lack of labour market as well, the production is only substance level. The people in the areas experienced food scarcity in raining season before the harvest.

4.1.1 The overview of the Irrigable areas in Sagaing Region

About 1/3 of the region where irrigation schemes currently exist can be broadly considered as potential “project areas”. Specifically, there are 26 irrigation schemes in Region according to the data from the MOAI in 2012⁹. The 26 irrigation schemes in the regions are located in 14 townships of the region_ all but one are located in the Southern part of the region. In other words, majority of the dams are concentrated in the Southern part of the region and only one dam is located in Tamu, western part of the region.

The estimated total population of the irrigable areas could be 60% of the total populations 6,541,000 as all of the irrigated areas are located in the region’s populated Southern part located in Irrawaddy and Chin Dwin River basins while the rest are areas occupied by hilly Chin State and hilly Naga (autonomous regions) where population density is low. The following maps¹⁰ and table show the irrigable areas located in different townships within the regions.

⁹ There are 56 river water pumping projects in Sagaing Region and the information on where they exactly are in the regions have yet to receive by the SA.

¹⁰ All three Maps used in this report showing irrigable areas of three regions are modification of Maps developed by MIMU which are modified by adding the blue points indicting the irrigable townships. Accordingly the source of irrigable locations is MOAI.

Irrigation in Sagaing Region

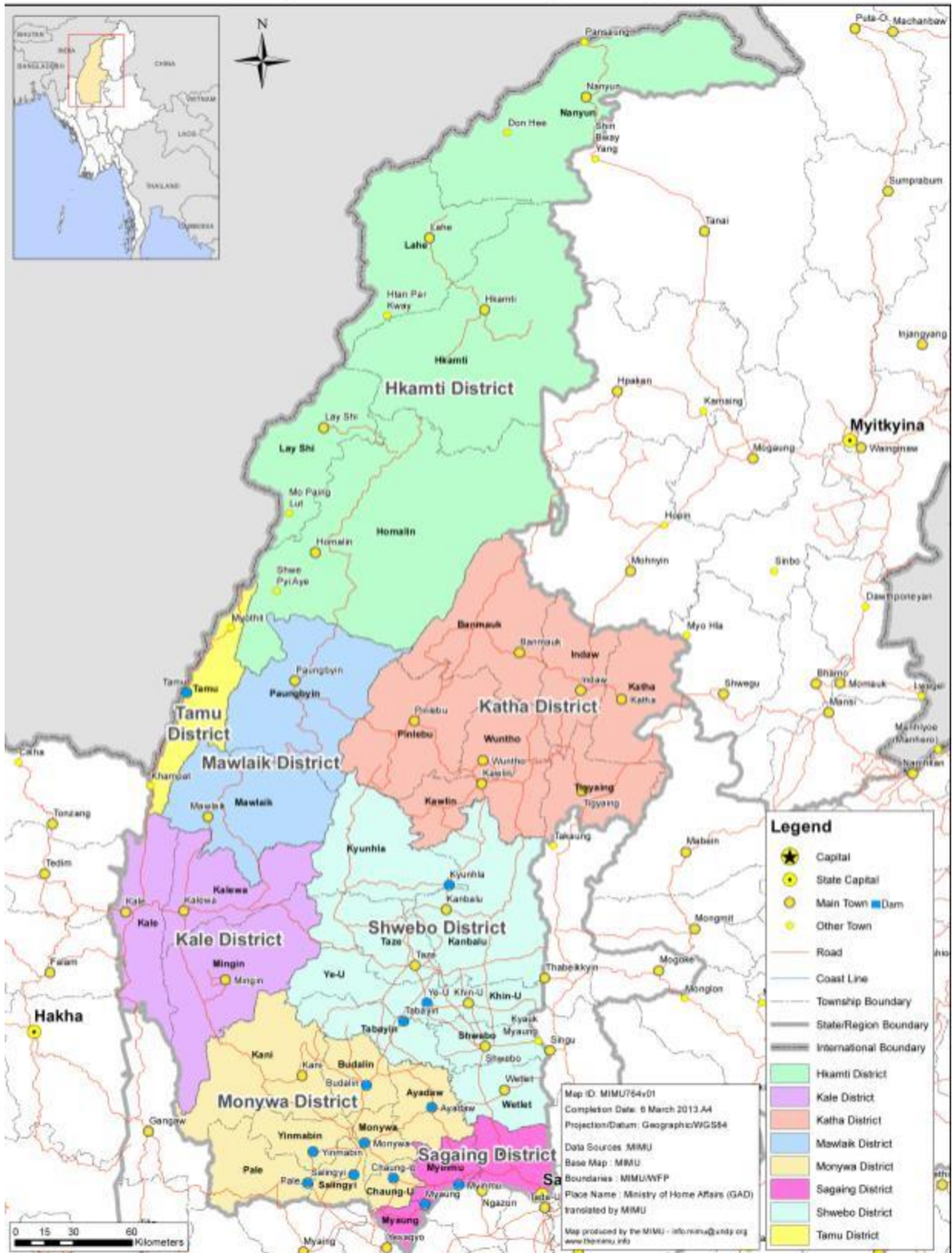


Table 3: Irrigation Schemes in Townships within Sagaing Region

NO	TOWNSHIPS	NUMBER OF DAMS ¹¹	PROJECT NAME	PART OF REGION
1	A Yar Taw	2	Rehabilitation and Modernization Project Of Ye-U Canal System, A Yar Taw Dam	South
2	Bu Ta Lin	2	Ground Water Irrigation Project (1), Myothit Dam	South
3	Chaung-U	2	Ground Water Irrigation Project (1), Nwegwe Dam	South
4	De Pe Yin	1	Rehabilitation and Modernization Project Of Ye-U Canal System	Mid-South
5	Kant Ba Lu	3	Kyeebinakk Dam, Paykyi Dam, Lin Apn	Middle of the Region
6	Kyun Hla	2	Kindat Diversion Dam,Thaphanseik Dam	Middle of the region
7	Monywa	4	Ground Water Irrigation Project (1), Thazi Dam,Htanzalote Dam, Bawditathaung	South
8	Myaung	1	Letyetma Dam	South
9	Myin Mu	1	Latpan Dam	South
10	Palae	3	Hlaing Chaung dam,Northyamar Dam(Modulating Dam),Kandaunt	South
11	Sar Lin Gyi	3	Ngwe Thar Dam,Sar Lin Gyi Dam,Phoung Ka Dar Dam	South
12	Ye-U	1	Rehavilation And Modernization Project of Ye-U Canal System	Mid-South

¹¹ The number of dams are overlapping as one scheme is located in two to three adjacent township of different administrative boundaries. For example: The so-called Ground water irrigation project 1 is located in 3 townships: Chaung U, Butalin and Myaung.

13	Tamu	3	Tonekyaw Weir,Zayti Weir,Wetshoot Weir	West
14	Yinmarpin	2	Ywathaya (99) Ponds, Northyamar Dam	South

The main socioeconomic activity of the irrigable areas in fact is Ya farming as it is only 21% of the total agricultural land in the region are irrigated¹². However, Le farming in the South and Middle of the regions is the significant income source of the region. In addition to the farming the region also are rich with minerals and the region contained copper, gold, and jade mines. However, most of the mineral mines are located in the hilly parts of North Eastern part of the region. Only the famous copper mine called Lat Pataung Taung, Kye Sin Taung and Sape Taung are located in the Southern part of the regions specifically in Sar Lin Gyi Townships. In addition, there is a industrial zone in Monywa which is also the capital city of the Region. In addition, Monywa is also important place for tourism because of its famous Moe Nyin Than Bokdae. In Myaung Township of the Southern part of the region there are traditional clay pot industries.

Table 4: The Dams in Sagaing region as per their construction year

NO	COMMENCE D YEAR	COMPLETED YEAR	NUMBER OF DAMS	DAMS NAME
1	1991-92	91-92	2	Zayti Weir, Wetshoot Weir
2	1983-84	91-92	1	Groundwater
3	1990-91	91-92	1	Letyetma Dam
4	1991-92	92-93	2	Tonekyaw Weir, Nwegwe Dam
5	1986-87	93-94	1	Rehavilitation and Modernization , Project of Ye-u Canal System
6	1994-95	95-96	2	Thazi Dam , Ywathaya (99) Ponds
7	1994-95	96-97	2	Kindat Diversion Dam, Htanzaloted Dam
8	1996-97	01-02	2	Kyeebinakk Dam, Thaphanseik Dam
9	2002-03	03-04	1	Latpan Dam

¹² According to the data from Myanmar Census agriculture the total agricultural land holding of Sagaing region is 6368800.82 while the irrigated area is 1371295.33 which data however is only dam irrigation or data including river pumping areas.

10	2002-03	04-05	1	Ngwe Thar Dam
11	2003-04	04-05	2	Sar Lin Gyi Dam , Myothit Dam
12	2004-05	05-06	2	Phoung Ka Dar Dam, A Yar Taw Dam
13	2005-06	06-07	2	Paykyi Dam, Hlaing Chaung Dam
14	1994-95	97-98	1	Northyamar Dam
15	2005-06	07-08	1	Northyamar Dam (Modulating Dam)
16	2006-07	07-08	1	Bawditathaung
17	2006-07	08-09	1	Kandaunt
18	2006-07	09-10	1	Lin Pan

The dams in Sagaing region were constructed between 1990s' and 2000s'. There are 11 Dams constructed in the 1990's and another 15 dams were built within 2000s'.

Generally, significant ethnic populations in Sagaing are living in non-irrigable areas of the region that is hilly parts of the west, North and North East. However, it is known that there are Chin and Shan (Red Shan) in Tamu and Kalay which is the western part of the region.

4.2 Mandalay Region

Mandalay is situated in Central Myanmar of the country between latitude 20° 0' north and longitude 95° 45' east. Mandalay region is surrounded by the Sagaing, Shan and Magwe in its North, east, and west and is attached to Bago and Kayin States at its southern edge. Mandalay is a region which bears the fertile plains because of its watershed favored by several big rivers and their tributaries. The Ayeyawaddy Plain is its west, Mandalay-Kyaukse plain is in the east and the Sitaung Plain is in the south. The famous tributaries of Ayeyawaddy rivers: Dokhtawady, Panlaung and Myintnge are also important rivers for the regions' socioeconomic making famous Mandalay-Kyaukse Plain. Chindwin River also is included in the region joining Ayeyawaddy near Myingyan township.

Total area of the region is 37021.29 km (1,429,400 sq miles). Its population is 8,422,000 of which 2,847,000 are living at urban and 5,575,000 are in rural. The total population could be divided by gender as 4,260,000 female and 4,162,000 male. The population density is 583 per square mile. Mandalay region is comprised of 8 districts: Mandalay city, the townships in Mandalay city, Kyauk Se, Pyin Oo Lwin, Meik Htila, Yame Thin, Nyaung Oo Myin Chan. . Mandalay region could be divided into two by its climatic characteristics: arid North and semi-arid South. The north and middle of the region is arid and hot while the far south attached to Bago and Karen are semiarid and monsoon with much higher rain fall. The

annual rain fall of the region is 1115.75mm¹³. The rain fall of Mandalay is diversified based on the areas of the region and thus in turn determining its farming activities.

Table 5: Average Rainfall (mm) in Mandalay region over the last four decades

No	Stations	1981	1991	2001	2009
1	Mandalay (Middle)	862	753	773	680
2	Pyin-Oo-Lwin (the Northeast Hilly)	-	-	1559	960
3	Pyinmana (the South, Semiarid)	1489	1289	1494	843
4	Naung Oo (the West , arid and hot)	765	517	556	374
	Average	779 mm	639.75 mm	1095.5 mm	714.25 mm

Mandalay region is the area with vast ethnic diversity residing by Bamar, Shan, Danu, Lisu, Palaung, Kachin, Kayin and Chin. Ethnic people however are scattered in different parts of the region. Mandalay can be divided into two areas depending on its ethnic distribution: north and north east and; other parts of the region. The region's north and north east part particularly the northeast are resided by the Shan, Danu and Palaung and some Kachin in mixing with Bamars. The rest of the region are resided are largely occupied by Bamar ethnic while such ethnic groups as Karen are seen limited in the South of the region where the region is attached to its Karen State. Mandalay region has 6,746,270 acres of Agricultural land in 2009 and this has increased in doubled within 21 years time. This is because of the development of dams and other water harvesting schemes like water pumping and ground water pumping schemes_ over 50 dams and 75 river pumping schemes were built with over 20 years timeframe.

In fact, the large part of Mandalay grow paddy depending on the rainfall and its fertile soil at its famous plains before those water schemes by government after 1988. The region generally has similar agro ecological areas. Still, the region can be divided into three main parts based on its agro ecological zone: The North; north east; the east, the middle and the south and the west. The north, the east and south of the region are areas focusing on paddy. In addition to its focus on paddy, the areas of especially the South and middle grow other cash crops as sesame and beans and chilly. A few hilly areas in those parts have to grow oil crops and bean with the lack of sufficient water to grow rice. The west part of the region however is to focus on the "Ya" crops such as sesame, peanut and beans with much less rain fall and water availability to grow paddy. The north east is special because of its very distinct climatic condition with other parts of the region having high land cold weather. Given this favorable condition, it

¹³ Myanmar Statistical Year Book 2011. The data is the average of the four weather station of Mandalay located in Mandalay (the middle), Pyin Oo Lwin (the north east), Naung U (the West) and Pyinmanar (the South).

can produce perennial products such as coffee, tangerines and other fruits and barriers which are finally produced as preserved foods. In addition, the areas produce rice and vegetables.

Table 6: The 8 districts of the regions by its agro-ecological zones

Districts	Agro-ecological zones
Mandalay City	The middle
Mandalay city's other township	The middle (part of Mandalay-Kyaukse Plain and Ayeyawaddy Plain)
Kyauk Se	The middle (Mandalay-Kyaunk Se Plain)
Pyin Oo Lwin	The north east (the hilly cold)
Meik Htilar	The middle (Arid)
Yame Thin	The middle with orientation to the South (semi-arid)
Nyaung U	The west (arid and hot)
Myin Chan	The west (arid and hot)

Mandalay as the whole region is considered as medium high poverty level as it's the average poverty headcount of its 8 district is 26 and its national poverty share is 2.14¹⁴. However, the two districts of high poverty headcount_Meikhila and Nyaung U and Myin Chan are included in its region constituting 45 and 41 respectively. Those regions are resided largely by Bamar ethnics who mainly depend on "Ya" without sufficient rain fall and irrigated water. In addition, those areas are among the other parts of Dry zone experiencing the infliction of climatic variations resulted in significant and continuous crop failures. This is agreed by the rain fall data of the region. The rain fall in 48% in Naung U which is most arid area of the region where people largely depend on rain for their "Ya".

As a result, those areas also have high in migration. In addition, Mandalay is the region of one of the highest proportion of landlessness¹⁵. In addition, Mandalay is also low in per household crop holding with 4.97 acres as of Myanmar Agriculture Census 2010 data. Regarding with food security, Mandalay is second lowest per capita food security ranking 16 out of 17 regions in the country having 256 kg per capita.

¹⁴ UNDP poverty headcount 2009-2010

¹⁵ http://usaidlandtenure.net/sites/default/files/country-profiles/fullreports/USAID_Land_Tenure_Burma_Profile.pdf

4.2.1 The overview of the Irrigable areas in Mandalay Region

Most of the 57 irrigation schemes in the region are located relatively evenly throughout the region except in the North and North East part. As such, it could be stated that $\frac{3}{4}$ of the areas of the region are irrigable and thus constitute potential project areas. The 57 irrigation schemes in the regions are located in 12 townships of the region located mainly in the middle, the south and the western part of the region while only two dams are located in the region's north and north east.

The estimated total population of the irrigable areas could be 60% of the total populations 8,422,000 as all of the irrigated areas are located in the region's populated middle, the south and the west (Irrawaddy river basin). The following table shows the different townships where irrigation schemes are located.

DRAFT

Irrigation in Mandalay Region

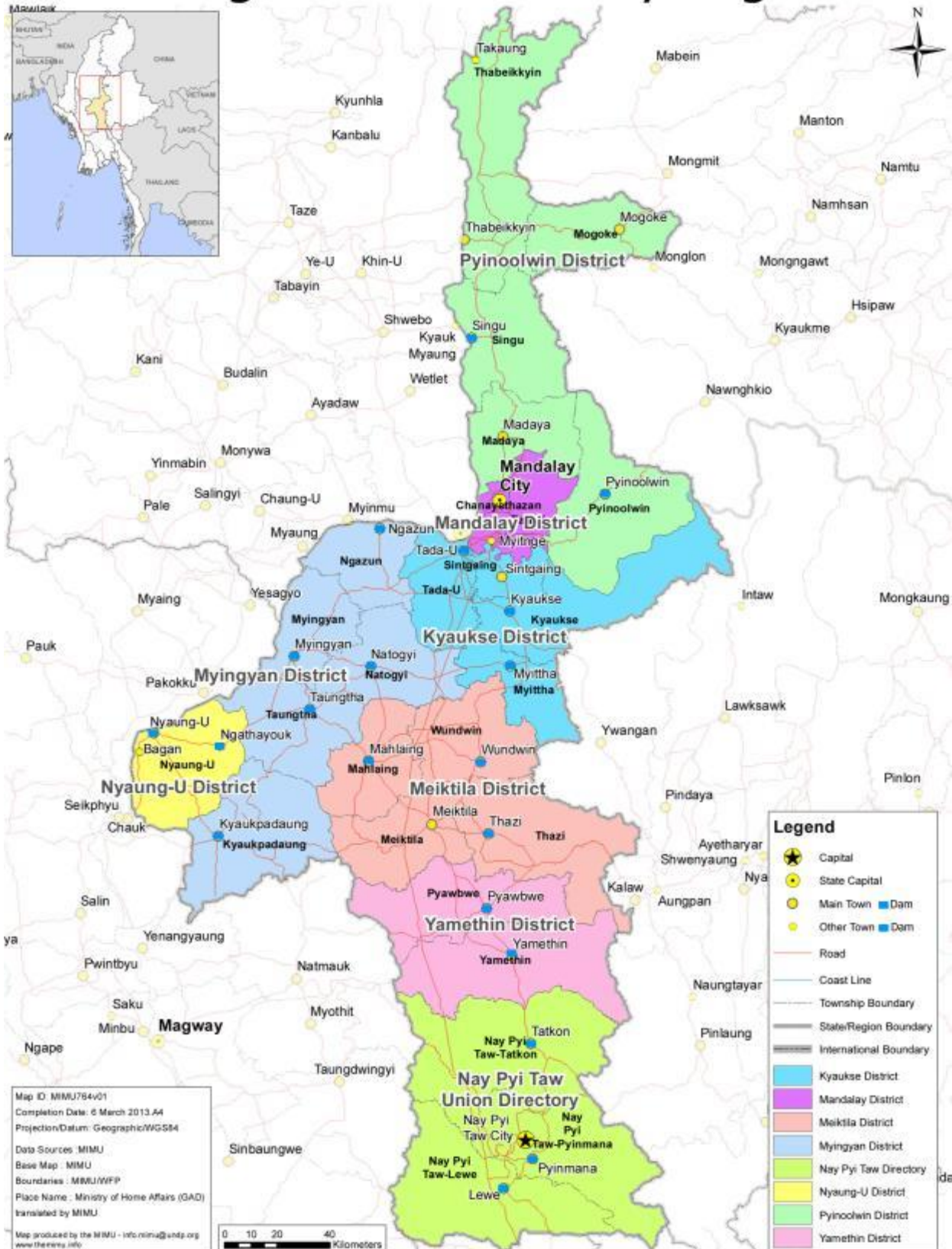


Table 7: Irrigation Schemes in Townships within Mandalay Region

No	Township	Number of Dam	Related Area	Part of Region
1	Kyauk Padaung	3	Taungyay, Kyatmauktaung Dam, Pinnchaung	West
2	Kyaukse	2	Kinda Dam, Myogyi Weir	Mideast
3	Leway	5	Thepyuu, Yanaungmyin, Madan Dam, Yeni Dam, Chaungmange	South
4	Mahlaing	3	Ponemaki, Tyinntar, Thin pone	Middle
5	Meikhtila	3	(A) Nyaung Kone (Green), (B) Letkhotpin, Shanmanga	Middle
6	Myingyan	4	Sunlun Dam, Taungpinle Dam, Myingyan Pump Irrigation, Myaukpinele Dam	West
7	Myintthar	2	Kinda Dam, Thittatkone (Weir)	Mideast
8	Ngahtoegy	1	Zeetaw (Weir)	Middle
9	Ngazun	3	Myothar, Phaungkataw, Natthartaw	West
10	Ngathayyork	1	Ngathayyork	West
11	Nyaung Oo	1	Myakan Tank Renovation	West
12	Pyawbwe	4	Lonngin, Chaung Gauk Dam, Chaung Gauk Weir, Thaphanchaung Dam	Middle
13	Pyinmanar	4	Chaungmagyi (Pyimanar), Paung laung, Tauk Pyo, Paung Laugn Weir	South
14	Pyin Oo Lwin	4	Doegwin Dam, Sithar (Supplementary), Sin Lan, Sithar	Northeast
15	Sink Kuu	1	Marlaenattaung	North
16	TaDa-U	2	Chaungmanat, Kinda Dam	North west
17	Tatkon	5	Sinthe (Weir), Myohla, Kintha Dam, Monchaung Dam, Sinthe	South
18	Taung Tha	6	Kyauktalone Dam, Sunkan Embankment, Thametgu Dam, Taungtha Dam, Ywelaung, Kyauktalone (Supplementary)	West
19	Thazi	2	Samon Diversion, Thettaw Dam	Middle
20	Wuntwin	2	Thapyayoe, Kinda Dam	Middle
21	Yemethin	2	Yeboatchaung Dam, Lephyu Diversion Dam	Middle

The main socioeconomic activity of the irrigable areas of the region is farming and 25%¹⁶ of the region's farmlands are irrigated. As a result, most of the farming are still Ya farming and garden land growing such perennial trees as Mango. However, irrigable areas of Mandalay also have manufacturing and tourism industries. In Meikhtila and Tharzi which is the middle part of the country have textile factory and canning factories. In fact, there are traditional small scale textiles factories. In Pyinmanar there is a sugarcane factory. In addition, Mandalay is the region with famous tourism industries because of its hilly resort in Pyin Oo Lwin and Bagan ancient city in Nyaung Oo Townships.

Table 8: The Dams in Mandalay region as per their construction year

NO	COMMENCED YEAR	COMPLETED YEAR	NO OF DAM	NAME
1	1980-81	89-90	1	Kinda Dam
2	1988-89	90-91	1	Thaphanchaung Dam
3	1990-91	94-95	1	Samon Diversion
4	1991-92	93-94	1	Sunlun Dam
5	1991-92	96-97	1	Kyauk Talone Dam
6	1993-94	93-94	1	Kintha Dam
7	1993-94	94-95	3	Taung Pinle Dam, Chaung Gauk Weir, Thet Taw Dam
8	1993-94	95-96	1	Chaung Gauk Dam
9	1994-95	94-95	1	Doegwin Dam
10	1994-95	95-96	2	Yeniweir , Monchaung Dam
11	1994-95	96-97	1	Myauk Pinle Dam
12	1994-95	97-98	1	Thametgu Dam
13	1994-95	98-99	1	Taung Tha Dam
14	1994-95	01-02	1	Ywelaung
15	1995-96	95-96	3	Myingyan Pump Irrigation, Yeboatchaung Dam, Lephyu Diversion Dam
16	1995-96	96-97	1	Sunkan Embankment
17	1996-97	96-97	1	Myakan Tank Renovation
18	1996-97	98-99	2	Pinnchaung, Sinthe
19	1996-97	99-00	1	Sinthe(Weir)
20	1998-99	99-00	2	Sithar, Thapyayoe
21	1998-99	04-05	1	Paunglaung
22	1999-00	99-00	1	Zeetaw(Weir)
23	1999-00	00-01	1	Thittatkone(Weir)
24	2000-01	93-94	1	Kyauk Talone Supplementary

¹⁶ Myanmar Agricultural Census

25	2000-01	00-01	2	Ponemakyi, Myothar
26	2001-02	02-03	3	Tynnthar, Phaungkataw, Sinlan
27	2001-02	03-04	1	Yanaung Myin
28	2002-03	03-04	3	Thinpone, Natthartaw, Chaung Ma Gyi (Pyinmanar)
29	2002-03	04-05	1	Taungyay
30	2003-04	03-04	1	Chaung Manat
31	2003-04	04-05	1	Thephyuu
32	2003-04	05-06	1	Ngathayok
33	2003-04	06-07	1	Chaungmange
34	2003-04	09-10	1	Madan Dam
35	2004-05	05-06	4	(A) Nyaung Kone (Green), (B) Letkhotpin,(c) Lonngin, Myo Hla
36	2004-05	07-08	1	Marlaenattaung
37	2005-06	05-06	1	Kyat Mauk Taung
38	2005-06	08-09	1	Paung Laung Weir
39	2006-07	07-08	2	Shanmanga, Sithar,
40	2006-07	09-10	1	Myo Gyi Weir
41	2007-08	08-09	1	Tauk Pyo

Most of the dams in Mandalay region were constructed during 1990s' and 2000s'. Only two dams were constructed during the 1980s'. It found that 28 out of 57 dams were constructed during 1990s' while the rest 27 dams were constructed during 2000s'.

Most of the irrigable areas in Mandalay are located in the South, middle and western part of the region where majority are Burmese. Only in Northeast where there are four dams in Pyin Oo Lwin township, ethnic minorities especially Shan people could be living in mixing with majority Bamar.

4.3 Bago

Bago Region is located between latitude 17° 20' 12" north and longitude 96° 28' 47" east and the total area is 24793 square miles. The total population is 6008000 and population density is 241 per square miles. The population in urban areas is 1492000 while it is 4516000. The total population could be divided by gender as 2988000 female and 3020000 males. Bago Region is divided as east and west by Bago Yoma (mountain range). The region also favored by rivers: Ayeyawaddy, Sittaung and Bago rivers creating fertile agricultural lands.

Bago division is sharing its borders with Magwe and Mandalay in the north, Kayin and Mon States in the east, Yangon in its south and Rakhine and Ayeyawaddy regions in its west. The region has four districts: Pago, Taungoo, Pyay and Thayarwaddy_ the first two are located in the east and the latter two are located in the west.

The region climate in general is wet monsoon climate. The average annual rain fall of the region is 2342.5 mm¹⁷. The Bago East and West being apart by the Bago Yoma have two different climatic conditions determined mainly by the rain fall. The annual rain fall of the east is around 3000mm while the west is around 1500 mm.

Table 9: Average Rainfall (mm) in Bago region over the last 4 decades

No	Stations	1981	1991	2001	2009
1	Bago (East)	3549	2999	3618	2854
2	Pyay (West)	1284	1082	1228	1059
	Average	2416.5 mm	2040.5 mm	2423 mm	1956.5 mm

Bago region is home to many ethnic groups: Karan, Bamar,, Mon, Chin, Rakhine, Shan and Pao. The Bago east is more cultural diversified than the west where majority Bamar are residing and a few population of Chin and Rakhine are sharing the areas where its border is attached to Rakhine and Magwe. On the other hand, Bago east is more ethnically diversified as its borders are attached to two main ethnic states: Mon and Kayin in its east and south east. However, those ethnic groups are mainly settled on the east side of Sittaung river¹⁸. The Pa O¹⁹ ethnic groups are also residing in Pago east in more scatter ways. The cultivated acres of the region is 6,998,264 acres in 2009 which have increased from 3,112,929 acres in 1988. Over one million acres are irrigated by 63 dams and 56 other water schemes.

Bago region could be divided into three main agro ecological zones mainly based on their farming activities determined mainly by rain fall and climate: the east and the west of Bago Mountain range. The east of Bago mainly focused on the paddy farming because of its rain availability and irrigated water. The east in fact could be seen as two parts: the east and west of Sittaung River. The east of Sittaung river is hilly and having more rainfall and thus resulting in growing rubbers and rice become its secondary crop. The west of the Sittaung river mainly focused on rice farming. The west of the region also focused on rice farming depending on rain fall. However, the northern part of the area also has significant portion of "Ya" farming because of its more arid climate and hilly nature of topography.

Table 10: The 4 districts of the regions by its agro-ecological zones

Districts	Agro-ecological zones
Bago	The east of Bago Mountain Range and the west of

¹⁷ Statistical Year Book, 2011. The data is calculated based on the two weather stations of Bago region: one is in Bago and another is in Pyay. It is the average annual rain fall of the two station in 2010.

¹⁸ Accordingly, Mon and Kayin are not seen as communities in the Swa Chaung Dam irrigated and irrigable areas which is located in the west of the Sittuang River.

¹⁹ Pa O is the ethnic group mainly resided in Shan South but they are also scattered in Kayin, Mon and Bago east.

	Sittaung river
Taungoo	The North of the region. The east side of the Bago Mountain Range and the east side of Sittaung River
Pyi	The North west of the region. Semi arid. The west side of the Bago Mountain Range and east side of Ayayawaddy River
Thayarwaddy	The South of the region and the west side of Bago Mountain Range

Bago as the whole region is considered as low in poverty level as it's the average poverty headcount of its 4 district is 17 and its national poverty share is 1.8 according to the UNDP poverty head count data. The poverty head count of the east and west Bago is 19 and 14 respectively. However, Bago is the region highest proportion of landless household²⁰. According to the Myanmar Agriculture Census, per household crop holding of Bago East and West is 8.45 and 5.95 acres respectively. Regarding with food security, Bago east and west are the highest and the third highest per capita food security having 791.4 kg and 708.1 kg respectively. However, people living in the hills of Bago Mountain range are considered as poor rather in terms of cash poor because they are relying on the forest products such as lodging and bamboo shoots. In addition, being less rain, Bago West are being faced with crop failures because of the insufficient rain fall and people in the northern part of the areas are especially economically vulnerable comparing to the rest of the area.

4.3.1 The overview of the Irrigable areas in the Bago Region

In fact most of the areas in Bago region are irrigable. There are 48 irrigations schemes located in 22 townships across the regions: 12 in the west and 10 in the east Bago. Accordingly, ¾ of the region can be stated as the project areas. The total population in the 22 townships of the population is estimated as 80% of the total population of the whole region. There are three important government industries in the region_ two is in the east and one is in the west Bago. The sugar factory and Ye Ni factory are important factories In East Bago region while Shwe Taung textile factory is located in Shwe Taung township in the West Bago. The following is the table showing irrigable schemes in 22 townships of the region.

²⁰ http://usaidlandtenure.net/sites/default/files/country-profiles/full-reports/USAID_Land_Tenure_Burma_Profile.pdf

Irrigation in Bago Region



Table 11: Irrigation Schemes in Twonship in Bago Region²¹

	Township	Number of Dams	Name of the Dam	Part of the region
1	Pyay	3	South Nawin dam, Kan Gyi Kone Dam, Ma Taung Ta Weir	Southwest
2	Shwe Daung	2	Natmaw Pump, Shwe Daung Dam	Southwest
3	Pauk Khaung	2	South Nawin Diversion Dam, South Nawin Dam	South
4	Pa Daung	3	Kyibin Dam, Nyaung Kine Dam, Khawar Dam	Southwest
5	Oak Pho	3	Sintgu Chaung Gaung, Gamone Dam, Min Hla Dam	Mid-West
6	Thegon	1	South Nawin Dam	Southwest
7	Nat Talin	1	Taung Nyo Dam	Southwest
8	Paung Te	1	We Gyi Dam	Southwest
9	Latt Patan	1	The Kaw Dam	Midwest
10	Tharyawaddy	1	Thone Se Dam	Southwest
11	Gyo Pin Kauk	1	Baw Bin Dam and Supplementary dam	Midwest
12	Min Hla	1	Kan Tin Beelin Dam	Southwest
Bago East				
1	Bago	6	Shwe Pyi (3) Dam, Zaung Tu Weir, Zalat Taw Dam, Mazinn Dam,Alaingni Dam, War Katoke Dam,	South
2	Dai Oo	4	Baw Ni Dam, Baidar Dam, Kawliya Dam, Baidar Weir	Southeast
3	Kawa	2	Pai Kyon (Sluice Gate), Shwe Hlay (Sluice Gate)	Southeast
4	Oak Twin	5	Minye Dam, Sittaung River Pump, Yethoe Dam, Khapaung Dam, Kaphaung Weir.	Northeast
5	Phyuu	1	Mgamwe Dam	Mideast
6	Kyauk Taka	2	Yenwe Dam, Yenwe Weir	Mideast
7	Taungoo	3	Kanni Weir, Sittaung River, Pump, Pathi Dam	Northeast
8	Thanat Pin	1	Tarwa Saluice Gate	Southeast

²¹ There are two dams namely Taung Mauk Dam and Seik Padaung Weir in the lists of irrigation schemes in Bago region. But we do not have information where they are located in Bago Region.

9	Waw	3	Shan Kine (Sluice), Moe Ywin Gyi Sluice gate, Nagar Mouk Saluice gate	Southeast
10	Yaetarshay	2	Swar Chaung Dam, Chaungma Gyi (Myo Hla)	Northeast

The 16 schemes in the West Bago are located across the region mainly Southwest and Midwest. The schemes are based on the tributary streams of Irrawaddy River. The 16 schemes are located in 12 townships of West Bago. The main socioeconomic activities of Irrigated and irrigable areas of the West Bago Region are Ya farming as only around 5% of the total farming household in the region are irrigated and the rest are Ya land and the silted land of the Irrawaddy river.

The 32 Schemes located in East Bago also are located dispersedly across the region in another 10 township of the region especially in southeast and Mideast. But all the schemes are located on the West side of the Sittaung River. Like Bago West, most of the schemes are based on the tributary streams of Sittaung River. The main socioeconomic activities of all irrigable areas in the East Bago region is Le farming which grows paddy. As only 8 %²² of the total farming are irrigated, most of the Le farmlands are rain-fed. In addition, farmers also grow sugarcane in their non-irrigated farmland.

Most of the schemes are constructed in the 1990s' despite that there are 5 dams in West Bago constructed during 1980's. On the other hand, no dam in East Bago were not built during 1980's, the socialist era. Over 40 dams were built between 1990s' and 2000's.

Table 12: The Dams in Bago region as per their construction year

No	Commenced Year	Completed Year	No Of Dam	Project Name
1	1981-82	90-91	1	Nathmaw Pump
2	1985-86	93-94	1	South Nawin Diversion Dam
3	1985-86	95-96	1	South Nawin Dam
4	1988-89	91-92	1	ShweDaung Dam
5	1989-90	90-91	1	Sintgychaung Gaung
6	1993-94	94-95	2	KyiBin Dam, Mataunta Weir
7	1994-95	95-96	1	TaungNyo Dam
8	1998-99	99-00	3	Myaungkine Dam, Wegyi Dam, Kngyikone Dam
9	1999-00	00-01	1	TheKaw Dam
10	1999-00	01-02	1	BawBin (Main Dam) (Supplementary)
11	2000-01	01-02	1	Thonese Dam
12	2000-01	02-03	1	Kantinbeelin Dam

²² Myanmar Agricultural Census 2010

13	2000-01	03-04	2	Gamone Dam,Minhla Dam
14	2001-02	02-03	1	Tarwa (Sluice Gate)
15	2002-03	04-05	1	Khawar Dam
Dams in East Bago				
1	1993-94	94-95	2	Mynye Dam,Kanni Weir
2	1993-94	96-97	2	Zaungtu Weir,Pathi Dam
3	1995-96	95-96	1	Sittaung River Pump
4	1995-96	96-97	1	ShwePyi (3) Dam
5	1995-96	98-99	1	Bawni Dam
6	1996-97	97-98	1	Yethoe Dam
7	1997-98	97-98	1	Mganwe Dam
8	1997-98	98-99	1	Zalathtaw Dam
9	1998-99	01-02	1	Swar Chaung Dam
10	1999-00	00-01	1	Shankine (Sluice)
11	1999-00	02-03	1	Baidar Dam
12	2000-01	01-02	1	Pai Kyon(Sluice Gate)
13	2000-01	02-03	1	Kawliya Dam
14	2000-01	05-06	1	Yenwe Dam
15	2000-01	06-07	1	Baidar Weir
16	2001-02	02-03	1	Alaingin Dam, Tarwa (Sluice Gate)
17	2001-02	07-08	1	Khapaung Dam
18	2002-03	03-04	1	Shwerhlay (Sluice Gate),Chaung Ma Gyi(myohla)
19	2004-05	05-06	1	Moeywinkyi (Sluice Gate)
20	2004-05	07-08	1	Warkatoke Dam
21	2005-06	08-09	1	Khapaung Weir
22	2005-06	09-10	1	Yenwe Weir
23	2006-07	09-10	1	Nagarmauk Sluice Gate

There are ethnic people particularly Karan people resided in irrigable areas of the Bago region. In West Bago, Karan people are residing as significant community in The Kone, Thayawaddy, Min Hla, Kyoe Pin Kauk and Oak Phoe townships. In west Bago, Ka Wa, Kyauk TaKa, Nyaung Lay Pin (not the township in irrigable areas), Phyu and Taungoo are the townships where Karans could be living in the irrigable areas a significant separate communities. In Pyay, Pauk Kaung and Pa Taung, Township in West Bago, there could be Ahsho Chin (locally called Plain Chin) living and doing farming in irrigable areas despite that most of them are doing Ya farming in hilly parts of those areas.

Section 5: Overview of the Studied Irrigation Schemes

As mentioned in the introductory section, an in-depth assessment was conducted under this SA for four selected irrigation schemes in order to identify and assess demographic, socioeconomic and other relevant characteristics of the irrigation schemes in the project regions. These four schemes were selected since they are considered to demonstrate many characteristics that are common among irrigation schemes in the project regions.

The study found that the two schemes Swa Chaung and North Yama are more abundant in water than the other two Sin Thay and Male Nattaung. The latter have problems of insufficient water inflow and thus resulting in irregular supply of water to the farmlands. The former two do not have such problem because of different reasons. Swa Chaung dam have sufficient water inflow because of its high precipitation in the catchment area. For North Yama it is mainly because of its associated dam which preserves water spilled over from the main dam which is capable to store only 14000 acre feet and the inflow is 130,000 acre feet. The associate dam was built in 2006 to store 120000 acre feet of spilled over water thus resulting in provision of irrigation in additional acres 10,000 since 2007. The following table shows more detailed information of the four schemes studied.

Table 13: Scheme overview information of four schemes studied

Particular	Sin Thay	North Yama	Swa Chaung	Male Nattaung
Location	Nay Pyi Taw Council, Tat Kone	Sagaing Region, Yin Ma Pin Districts, Pale township	Bago East, Taungoo District, Yaetar Shay Township	Mandalay, Pyin Oo Lwin district, Sint Kue township
The year of construction	1996	2005	1998	2004
Irrigable area (net) acres	15,218	11,320	23,467	6,500
Number of Village Tracts	33	17	24	10
Number of villages	78	35	133	30
Name of the townships included in the irrigable area	Tat Kone, Pope Ba Thiri	Pale, Yinma Pin	Yaetar Shay, Swa	Sint Kue
The zone where the scheme located	Southern Part of Mandalay ²³	Southern Part of Sagaing	East Bago, Western part of Sittaung River	Northern Part of Mandalay Region
Dam Storage total acre feet	143,090	14,057 (associated dam: 122,900)	216,350	57,470
Population in	107,962	69,500	80,009	22,800

²³ The area in fact used to be included in Mandalay region. But in terms of new administrative structure, it is included in Nay Pyi Taw Council.

command area				
Number of households	22,640	12,500	16,319	5,700
Number of farmers	5,420	3,000	17,000	2,364

5.1 Ethnic minorities in project areas

5.1.1 North Yama Irrigation Scheme

This irrigation scheme is located in Southern part of the region. The Southern part largely is resided by Bamars and its sub-ethnic groups called Gadu and Ganan are residing. However, Gadu and Ganan as sub-ethnic groups of Bamar have been assimilated into majority Burmese and their existence remained only in the literature. They speak Bamar and do cultural practices like majority Bamars. As such, no other ethnic groups but majority Bamar and its sub-ethnic group Ga Du and Ga Nan which are very much assimilated to Bamars are residing in both irrigated and irrigable areas of the proposed project.

5.1.2 Project in Male Nattaung

This irrigation scheme is located in the Northern part of the Mandalay region. Precisely, the irrigated and irrigable area of the project are located in the Irrawaddy plains of the region next to the Mandalay cities. In this area is resided only by the majority Bamars and no ethnic group is residing significantly as separate communities.

5.1.3 Project in Sin Thay

This irrigation scheme is located in the Southern part of Mandalay region which administratively is located in the Nay Pyi Taw Council. The area is resided mainly by majority Bamars and no ethnic people are residing as significant separate communities in both irrigated and irrigable area of the proposed project.

5.1.4 Project in Swa Chaung

This irrigation scheme is located in the East Bago's on the west of Sittaung River. In East Bago region, Karan ethnic groups are residing but on the east side of Sittaung River and on the hilly part of East Bago. As the proposed project area is located in the flat plains on the west side of the Sittaung River, there is no ethnic groups are residing significantly as separate community in both irrigated and irrigable area. The SA teams met a few Karan and Shan ethnic people who reside in Bamar community. According to them, it is learned that they are assimilated to Bamar speaking Bamar and practicing similar cultural practices of Bamar.

5.2 Religious minorities in studied irrigation areas

The SA found that Islamic people are residing in the project areas. They are residing both in terms of mixing with both Bamars and separately as their communities. One important thing is that they are not assimilated to majority Bamars like other ethnic groups and they maintain their religious and cultural practices. But they are not using different farming practices to the Bamars. The Christian and Hindu religious population could also be existing in the project areas particularly in Swa Chaung (Bago East) project areas despite that they are not identified by the SA researchers. It is very possible that Christian

populations are residing in mixing with and more assimilated to Bamar comparing to the other two religious minorities.

Section 6: Findings of the Social Assessment-Socioeconomic Information

6.1 Farming systems

6.1.1 Land Types

Farming system of the villages studied could be categorized into two groups based on their land types and associated cropping patterns: “Le” focused and “Le” and “Ya” combination. Generally, villages in two areas_ Yaetar Shay and Sint Kue are “Le” focused while Tat Kone and Pa Le belongs to “Le” and “Ya” combination pattern. Technically “Le” focused land are to grow paddy and “Ya” land can grow other crops like sesame, peanut and bean and so on as they literally cannot grow paddy because of the limited water availability or topology. As such, most of the farmland in Yaetar Shay, Pa Le and Sin Kue Townships are “Le” land despite that one village in Sint Kue and one village in Pa Le have “Le” and “Ya” combination type.

There are also peculiar cases regarding land patterns_ farmers in Pa Le Township grow “Ya” crops on “Le” land despite that they are supposed to grow paddy twice. And the other case is that the “Le” land of one of the villages in Sint Kue is “Ma Yae” type which is silted land right beside the Ayeyawaddy River. The main difference of normal “Le” and “Ma Ye Le” is distinct timing of growing paddy as the latter is grown at the at the end of raining season when the water level in the river recedes while paddy in normal “Le” is to be grown in raining season (July to Oct/Nov) or at the end of winter (March to May/June).

6.1.2 Access to Land

Majority of the farmers have land utilization certificates issued by State recently...

The study found that majority of the farmers in the villages studied regardless of their farmland types (Le or Ya) are provided with “land utilization” certificates issued recently by the government after new land laws stipulated in March 2012 (for more details on the land tenure, see in Land sections). All of the farmers in 5 villages are provided with the certificates while 50% to 99% of the farmers in the rest of the villages have yet to receive because of the several reasons including limited capacity of township LRD, the land disputes, entitlement transfers and the late applications.

Access to land as sharecropper found but not significant number...

The study also found that some of the people are also accessing land as sharecroppers who rented their land from others informally. The study found that sharecroppers in most of the cases are small farmers, and that there are comparatively less cases of sharecropping by landless labourers as they lack farming tools and investment capital. Women headed and aged landowners tend to give share cropping. Basically, people with larger land holding with less labour tend to give sharecropping. However,

sharecropping mostly is taken place between farmers of next to kin. In addition, sharecropping is done particularly in summer crops which need more attention than monsoon paddy by assuring water availability and giving more inputs especially the fertilizer.

Generally, the number of sharecroppers is very small (3 to 4 sharecroppers in each village). The sharecroppers usually sharecrop 2-3 acres of land. Terms of sharecropping are seen in the following tables.

Table 14: Terms of sharecropping in different areas

Regions	Paddy ("Le")	Sesame/Bean ("Ya")
Sint Kue (Northern Mandalay)	12 baskets per acre	
Pa Le (Southern Sagaing)	20 baskets per acre or	5 baskets for sesame
	10000 Kyat per acre	20 baskets for peanut
Yaetar Shay (East Bago)	25 baskets per acre	
Tat Kone (Southern Mandalay)	1/3 of the output	

It is learned that the terms of sharecropping is eased between the relatives. Related sharecroppers can give installments while non-relative sharecroppers have to give in advance in some cases.

The practices of sharecropping decreased largely because of more mechanical progress in farming ...

People in the villages studied reported that practices of share cropping decreased but for the different reasons. One of the main reasons is that farming is more mechanical. In fact one of the main reason of share cropping is the lack of enough labour especially for the aged and women headed households. However, this need could be solved with the help of farming machines lately and thus resulting in declining of the practices of share cropping. This was found more obviously in Yae Tar Shay. sharecropping is declining also because of the increased profits from their lands since they gain water from irrigation. However, in villages with less water availability also do not have much sharecropping because it is the tenants who do not want to do sharecropping as they have risks to do that business with unavailability of water. Before, the weather could be predictable and now the weather is less predictable and more importantly, people have other choice of works especially migration to abroad. So, these are the reasons which make sharecropping practices decreased in villages studied.

6.1.3 Farmland distributions

The study found that farming system is not significantly determined by the land holding size as much as it was by topography and water availability. However, the study found some important variations of farming practices under a certain type of farming systems shaped by the land holding size such as planting methods, choice of types of crops, types of tools and in some places in crop intensities and so

on. In order to explain how land holdings create some variations in a certain main farming system, the landholding sizes of the areas studied are first to be explained.

The average land holding sizes of small, medium and large farmers for all villages studied are minimum 2 to maximum 4; 5 to 8 and; 10 to 17 acres²⁴. According to the study, North Yama is the area where the land holding size is the largest while Tat Kone Township is the smallest. The differences in land holding sizes by different areas are described as in the following tables.

Table 15: The average minimum and maximum land holding sizes of communities under four different irrigation schemes

Townships	Schemes	Big Farmers		medium		Small	
		Max	Min	Max	Min	Max	Min
Sin Ku (Northern part of Mandalay Region)	Male Nattaung	16	10	6	5	4	2
Pale (Southern part of Sagaing Region)	North Yama	25	11	10	7	5	2
Yaetar Shay (East Bago)	Swa Chaung	15.75	9.5	7.5	5	3.5	1.25
Tak Kone (Southern part of Mandalay Region/near NPT)	Sin Thay	14	8.5	7	4.5	4.5	2
Average land holding sizes of all villages studied		17	10	8	5	4	2

Landless are generally the dominant types in all villages studied...

The study found that the most dominant type of households in the villages studied is the landless households constituting 55% of the total population. Not all landless are not agricultural labourers especially in the peri-urban villages. Medium farmer follows the second largest portion occupying 21% of the total households. The large farmers are the smallest portion with only 9% while the small farmers occupy 16% of the total farming households. According to the data, East Bago is the region where the landless population is the highest while Mandalay is the area where small farmers and landless population are higher. On the other hand, Sagaing is the area where landholding population is the largest as the medium farmers and landless population is dominant while Tat Kone which is southern part of Mandalay region near Nay Pyi Taw is the area where medium, small and landless are fairly distributed.

²⁴ This classification on different types land ownership is done by researchers' reflections based on people's perceptions.

Table 16: The distribution of four different types of farming household of four regions studied²⁵

Tsps. and Regions	Avg. # Large Farming HH	Avg. # Medium Farming HH	Avg.# Small Farming HH	Avg. # Landless HH	Avg. Total HH	Avg. Total farmland acres
Sint Ku (Mandalay Region/Northern part of Mandalay Region)	11	27	41	254	335	901
Pale (Sagaing Region/Southern part)	34	110	43	77	266	3083
Yaetar Shay (East Bago/west side of Sittaung River)	18	53	61	101	233	964
Tak Kone (Southern part of Mandalay Region/near NPT)	12	31	23	147	213	858
Average (all)	19	55	42	145	262	-
Percentage (%)	7	21	16	55	100	-

Pure “Ya” farming households exist in a few villages constituting minimum 6% to 50%...

Pure “Ya” farmers exist in four villages of the four areas studied_ one in each region studied. In Tat Kone (southern part of Mandalay) and Yaetar Shay (East Bago), farmers whose farmlands are pure “Ya” land tends to be small farmers who own round about 2-3 acres. Pure “Ya” farmers in Sint Kue and Mandalay on the other hand are not small farmers but are mixture of large, medium and small farmers. The following tables show how “pure Ya” land²⁶ constitutes in four villages studied.

²⁵ This is the average of the data of three-four villages studied both in actual and pretest

²⁶ Many Ya lands could be transformed to Le land after rehabilitation of the canals. Still pure Ya land will be remained as they are located in the upland to which it is not sure the irrigated water could be delivered.

Table 17: Pure Ya land estimated compositions in four villages

Village	Regions	Total farming HH	Pure Ya Land HH	% of Pure Ya
Kun Ohn	Yaetar Shay Tsp. (East Bago)	51	5	6
Nyaung Lunt	Tat Kone Tsp. (Southern Mandalay)	84	5	9
Ngwe Taung	Sint Kue Tsp. (Northern Mandalay)	92	-	20
Mon Thwin	Pale Tsp. (Southern Sagaing)	348	-	50

6.1.4 Crop Patterns

Rice generally is the main crop for half of the villages studied and the other half of the villages rely also on other crops such as sesame, beans, peanut and sugar cane apart from the monsoon paddy. Generally, “Le” and “Ya” mixture of the villages which is also are villages with bad irrigation water have to rely on other crops with the exception of two villages in Pale where villages grow cash crops despite that they received irrigated water.

Generally, 6 out of 14 villages studied have 2 crops annually, in 5 out of 14 villages have 3 crops and the remaining 3 villages only got 1 crop per annum. Villages where two crops per annum are growing mainly paddy both in monsoon and summer while 3 crops per annum villages grow other types of crops apart from monsoon paddy. Two villages out of 3 villages where only one crop per annum grow monsoon paddy and grow sugarcane on part of their land. There is only one village in Yaetar Shay where farmers are to be considered as having one crop per annum without having other secondary crop to rely on. In that village farmers are supposed to grow two crops of per annum_ monsoon and summer paddy and farmers also are making efforts to grow summer paddy. Unfortunately their summer paddy almost every year failed because of the water unavailability from irrigation scheme. The following table shows the crop patterns of villages studied (For more detailed crop patterns, see seasonal calendar in the annexes).

However, villages in Tat Kone (Southern Part of Mandalay Region) and Pale (Southern Part of Sagaing Region) have more secondary crops than the other two areas_ Sint Kue (Northern Part of Mandalay) and Yaetarshay (East Bago) where rice is primarily focus growing both monsoon and summer paddy. Villages in former two areas grow only one paddy (monsoon paddy) while the latter grow both monsoon and summer paddy. The former two areas grow sesame, beans, peanut, chick pea and vegetables instead of summer paddy.

Table 18: Crop patterns by villages of four regions studied

Villages and Regions	Le	Ya or other part of farmland
1. Pyi Soe Aung } Sint Kue Tsp. 2. Pin Le Gyi	2 crops (monsoon and summer paddy)	Pigeon Pea and winter peanut
3. Nge Taung (Sint Kue Tsp.)	1 crop (Mayae Paddy on the silted land)	Sugar Cane
4. Kokosu } Pale Tsp. 5. Ei Yaung	3 crops (early monsoon sesame, monsoon paddy and winter sesame or Chickpea)	
6. Mon Thwin	3 crops (early monsoon sesame, monsoon paddy and winter sesame or Chickpea)	2 crops (early monsoon sesame and Chickpea in raining season)
7. Thapyay Tan (Yaetar Shay Tsp.)	2 crops (monsoon and summer paddy)	
8. Inn Kyin Kone (Yaetar Shay Tsp.)	2 crops (monsoon and summer paddy)	
9. Phoe Kyar Nyo (Yaetar Shay Tsp.)	1 crops (summer crops tried every year but mostly failed)	
10. Kun Ohn (Yaetar Shay Tsp.)	1 crops (monsoon paddy)	Sugarcane (two year term)
11. Oakshit Kone } Tat Kone Tsp. 12. Inn Phat Kone	2 crops (monsoon paddy)	
13. Nyaung Lunt	3 crops (monsoon paddy, green gram, bean/cabbage)	3 crops (Green gram, cotton/Chili, bean/peanut)
14. Kyar Thay Ei	3 crops (monsoon paddy, green gram, bean/cabbage)	3 crops (Green gram together with corn, cotton, Cabbage)

Large farmers have more multiple crops than smaller farmers...

Main crop patterns are not differed between large, medium and small farmers. However, the study found that larger farmers mostly are able to grow more different crops simultaneously than small and medium farmers. Given that large farmers have two to five times of land more than medium and small

farmers they have more space to grow one crop while the other crops is at the stage of nurseries or to produce seeds for grow another crop seasons. In addition, large farmers in those villages with “Le” and “Ya” combination farming system, there will be 6 types of crops per year while small and medium farmers in the same village have half of it. Accordingly, large farmers could be more resilient to climatic variations and price fluctuations. The following boxes are how large land holding sizes favored for more crops and productivity.

Case 1: Large farmers of “Le” focused farming in Tat Kone Township growing green gram in early monsoon season May to mid-July while paddy is nurturing some part of their land.

Case 2: Large farmers of “Le” and “Ya” combination farming system grow green gram, corn, potato and chili simultaneously on their Ya Land at the early monsoon season. Then they grow cotton for five months. The grow cabbage in winter. On the hand, on “Le” land, large farmers grow green gram at the early monsoon season which is followed by monsoon paddy and the cabbage is at the later parts of the year. So, large farmers in this type of land grow nine types of crops annually while small and medium farmers only have 3-4 types as most of the small farmers in those villages mostly have “Ya” land.

Case 3: Large farmers in Sint Kue Township grow peanuts during early monsoon season while they are working for growing nurseries for monsoon paddy. The peanut in this season in fact is for winter crops. On the other hand, small farmers cannot grow peanut not only land holding size is unfavorable but also the investment capital as the seeds costs of peanut itself is expensive 32000 Kyat per basket.

6.1.5 Farming Techniques

Farming gears

More mechanical than 3-5 years before in most villages studied...

Generally, the studied found that two areas studied_ Yaetar Shay (Bago East) and Sint Kue (Northern Mandalay) are more mechanical than the other two areas Tatkone (Southern part of Mandalay region near Nay Pyi Taw) and Pale (southern part of Sagaing regions). The use of farming gears_ whether traditional or mechanical in fact is largely related to its farming types “Ya” and “Le”; asset holding and labour market.

The villages studied under two areas Yaetarshay (East Bago) and Sint Ku (Northern Mandalay) used power tillers in plowing while the other two (Southern part of Mandalay region near Nay Pyi Taw) and Pale (southern part of Sagaing regions) still used drought cattle. This largely because of the main type of farming system: the former two are “Le” focused systems and the latter two have mixed system “Le” and “Ya”. The power tiller is not suitable for “Ya” lands which is not flat landscape. So, people in the latter two areas where farmers tends to own their land in both types “le” and “Ya” maintained drought cattle. On the other hand, the former two areas are obviously using the power tillers in plowing.

Cattles, traditional tillers and bullock cart are still using because of the systemic needs...

Cattles and traditional tillers and bullock carts are still being used largely in Pale as well as other three areas to a certain extent for several reasons. First of all, the power tillers according to the farmers cannot plow as satisfactorily as cattle. Second, cattle and the bullock carts is more flexible to move from plot to plots while the machines are not so because of the farming infrastructures and bad village roads. Third, the traditional cattle and bullock cart are useful for carrying farming staffs in their farmland. Finally, maintenance cost is one of the significant issues that famers take into considerations for transforming totally into the machines. So, these are the reasons people still maintain traditional farming tools. On the other hand, people gradually are using machines because of the labour shortage, shortage of the pasture land and climatic variations.

“Plowing with cattle is better. The land is well plowed by cattle (and traditional plowing tools). The cattle and traditional wooden plowing machine plow more deeply than the machine does. The traditional plowing breaks the land 6 inches while the machine only does 4 inches. As a result, the weeds are killed using traditional ways and we don’t need to use weed killers”.

(One of the farmers in Pale Township)

“Off course farmers want to transform into mechanized farming as labour is becoming scarce and expensive and more difficult to have in times of urgency. Machines are save time and waste of production. But initial cost of the machine is high as well as repair cost which comes up unexpectedly. It is worse that farmers do not have enough knowledge and skills on the machines but they are with their traditional tools”

(Another farmer in Pale Township)

Labourers are largely depended for growing and harvesting...

Given that all four regions used transplanting methods for growing paddy and largely depended on the women landless labourers. Regarding with the harvesting, all regions except 3 villages mainly used human labour. Two villages in Yae Tar Shay are seen using big harvesters through the private services. The big harvesters which also include threshing functions could be hired for 30,000 Kyat per acre. The two villages using that service are located right beside the Yangon-Mandalay No 2 road and they are primarily growing paddy with irrigated water. The other village in Mandalay which has large farming areas depending on the silted land of Ayeyarwaddy river and rain used small harvester which does not include the function of threshing.

Threshing machines are widely used in three areas but one...

Most of the farmers in villages studied in three areas: Yaetar Shay, Tat Kone and Sint Kue use threshing machine which is more cost effective and saving the waste caused by manual threshing mean. The villages studied in Pale Township however still using human labour for threshing because threshing machine breaks the stalks of paddy plants and thus the straw could not be used as cow feed. The cost for using threshing machine is 4 baskets of paddy for threshing 100 baskets in Sint Kue and 200 Kyat per baskets (20,000 Kyat per 100 baskets) in Tatkone and Yaetar Shay. Threshing manually costs 6 basket of

paddy per acres which is around 27,000 Kyat in cash as per 4500 Kyat per basket of paddy). If it is the case, using threshing machines is much cost effective.

Large farmers are more accessible to machines...

Large farmers in Yatarshay, Tat Kone and Sint Ku tend to own power tillers and used both machines and drought cattle in plowing. As cattle better plow than the power tillers, large farmers used both machines and cattle in order to plow satisfactorily. In addition, big harvesters in Yaetar Shay are mainly used by big farmers because those machines are only suitable for the large land plots. On the other hand, small and medium farmers who did not own farming gears, they are to hire gears. As a result, they are not favored like large farming to make the land at their satisfactory level. And they have to use different gears depending on its availability_ sometimes they used machines first for the first stage of plowing while cattle are used for refining and sometimes vice versa. As a result, they have higher in production costs and delays in farming activities waiting for availability of the gears.

Farming Methods

Largely remained traditional in planting methods...

Farmers in villages of all studied areas except one are still largely maintained traditional planting methods. Farmers in those three areas are still using traditional transplanting methods while those in Tat Kone Township are using transplanting methods called Good Agricultural Practices (GAP) provided by the agricultural departments. The practice is locally known as "Rope Line Method".

Farmers in Tat Kone Township are using new methods for several reasons. First of all, most of the farmers as well as labourers know very well about the practices because the DOA provides training on the methods very frequently to both farmers and the labourers who are the planters groups formed especially with the women. Secondly, the persons from DOA not only the field extension workers but also the officers at the department are usually at the farmland looking after the Pale Thwe plantation. So, they can give close guidance to the people using new methods. So, people there become to apply new methods not only to the Pale Thwe crops but also to other crops of their choice. Thirdly, farmers like the new methods for several reasons: first farmers can wait and see the step by step progress of the plantation and the yield can be assured if they plant as it is instructed by the new methods; second, the labourers do not have a chance to make cheating in planting and third, the yield is 10-15 basket higher than the normal planting methods. So, farmers asked the planters (the women labourers) to plant according to the new methods by paying more.

Farmers have heard of new methods but not know very well...

Farmers who maintained traditional transplanting methods in fact have heard about the new methods because of the talks of the DOA which distribute the methods while they are encouraging Pale Thwe. Most farmers however have same perception that the new GAP methods are in fact nothing special as it is encouraged by DOA. In addition, people do not like the particular requirements of new methods especially the planting the plants as it is precise specification 6 inches distant from each other. People

also do not like the new method which is more costly than the normal one. The following quotes are reflecting different point of view of the people on the new methods.

“It is neither the method (Rope Line) nor the Pa Le Thwe (hybrid seeds encouraged by DOA) that make high yield. But it is the fertilizer that helps the high yield. People here do not like the method of much specification. The labours also do not like that. If we pay 2500 Kyat per day for normal transplanting method, then we have to pay 3000 Kyat per day for using “Rope Line” method”.

(a farmer in Pa Le Township)

Women headed farmers reported that they have less knowledge on the farming methods. Women respondent replied that they used only the traditional methods.

“As we are women, we do not know the methods. We use the traditional ways and if we want to know something we have to asked old farmers”

(A women headed farmer in Sint Kue Township)

Most of the seeds used by farmers are not traditional...

The study found that seeds of different crops grown by farmers are not traditional ones. The paddy seeds grown in all villages studied are new types emerged lately_ the earliest one emerged since 5 years ago and the latest ones are one year ago.

Disseminators of new techniques

Peer-to-peer learning especially from large farmers is a key in disseminating new seeds...

The study found that most of the famers grow new seeds when they see good results of new seed grown by other farmers who in most of the cases are large farmers who at least have 10 acres of farmlands. This is because large farmers possessed large areas of farmlands and are affordable to test new seed on one acre of farmlands.

The study found farmers who could be considered as model farmers in four villages studied_ two in two villages of Yaetar Shay township and another two in two villages of Tat Kone. All of those farmers are large farmers with 10 to 40 acres of farmland. Those farmers are tends to be influential as village elderly and respected persons or educated persons. Those people have exposures dealing with institutions outside the villages especially government departments. In two cases, they are former cooperative committee members and canal watch appointed by irrigation departments as well as former village administrators. One common finding of all four cases is that those farmers purchased new seeds produced at Yaesin agricultural university. And two of them are seed producers and distributors for the villages in the area. They also accepted demonstration plot of “Pale Thwe” for the government. Farmers from their villages became grow new type of paddy seed and other different crops when they looked at plantations of those farmers or with the recommendations of those farmers. In two cases, farmers grow green gram and new type of cotton after those pioneer farmers did in their farmland. The study shows that farmers learn about the new seeds rather than other farming methods.

In other areas apart from the four villages mentioned, farmers replied that they grow new seeds by learning from those who growing. According to them, those from whom they learn tend to be large farmers. More importantly, large farmers tend to be selling second generation of new type of seeds and it is medium and small farmers who purchased from them started using new type of seeds.

Paddy traders are also key disseminators of new seeds to farmers...

Farmers reported that they want to test new types of crops if paddy brokers recommended as popular types in market. Farmers have more confident to grow new types of paddy recommended by paddy traders because of the market demand.

Input market suppliers are main distributors of methods of using fertilizers and pesticides...

Regarding with the methods on the usage of fertilizers and pesticides, it is learned that the input market suppliers are the main distributors for the farmers. In fact, they use the method provided by the companies not because that they trust them but because need to use something and the people from the companies reach to them. It is also reported that farmers used mouth spreading methods used by local people and been faced with crop failures.

“I use fertilizers as they came and sell at the village. It is not that I trusted them but they told us how it is good and I used it as a test.”

(a farmer in Yaetar Shay)

“I used washing powder as people said it killed pesticide. But the plants later became yellow and died”

(a women farmer in Sint Kue)

6.2 Market

6.2.1 Input Market

Two of the main inputs for farmers apart from labour and finance that are fertilizer and seeds are accessed from different sources by different types of farmers. The study revealed that large farmers generally are more accessible to inputs of better quality for more favorable terms than smaller farmers.

Seeds

There are three main types of sources from which farmers access to seeds in all villages studied: seeds distributors especially large farmers in the areas, the government nursery distributors and farmers in the same village. The first type of the source of seeds that is large farmers produce seeds by using seeds from Yesin Agriculture University. Those seed producing and distributing farmers mainly are in the villages more accessible to cities locating right beside the main roads. Most of the farmers in Yaetarshay and Tat Kone are purchasing seeds from such seeds producing farmers. And this kind of farmers are found in three villages studied _ two in Yaetar Shay and one in Tat Kone village. However, such kind farmers are not found in Sint Kue and Pale Townships.

Large farmers mostly however purchased first generations seeds from government nursery garden located at the township or Yaesin University when they need to change seeds every three years. This is in fact is the case in all visited four townships during the study. Accordingly, large farmers mostly are accessible to better seeds especially first generation seeds from guaranteed sources. On the other hand, small and medium farmers generally are only accessible to second generation seeds redistributed by large farmers. According to the farmers it is learned that first generation seeds and second generation seeds are differed in resilient to climatic conditions and yield. The first generation seeds are 20-25 baskets higher in yield than the second generation seeds.

One more important finding is that most of the big farmers can saved seeds every year and they change seeds every three year. On the other hand, small farmers cannot save seed every season as they have to sell all of their produce and thus they have to buy seeds especially from large farmers every season.

Table 19: The price difference of the seeds in villages and other primary sources

Townships/Regions	Seeds price (Kyat) in village (second generation seeds)	Seed price (Kyat) at main source (first generation seeds)
Yaetar Shay	6000-6500	7500 (Yaesin University)
Tat Kone	5000-7000	7500 (Tat Kone government Nursery Garden)
Sint Kue	6000	15000-17000 (1.4 baskets) from Matayar and Kyauk Se government nursery garden
Pale	7500	10000 (from Pale government nursery garden)

Fertilizer

Fertilizer is in kind credit from different sources differed as per farming types: big, medium and small. Like in seeds, large farmers are accessible to fertilizers better terms than medium and small farmers. Most of the Large and medium farmers are accessible to fertilizers from the input market suppliers at the township or the village tract. They can purchase installments by paying only half of the amount cash down and the rest could be paid after harvest. On the other hand medium farmers are to purchase all on credit and they have to pay interests (See detailed terms in credit market).

In addition, some of the large farmers tend to be representative of input market suppliers from the township and they redistributed fertilizers especially targeted at small farmers in the village. Small farmers largely purchased fertilizers from those representatives at the village level on credit paying interest rate. The study also found that large farmers tend to purchase good quality fertilizers while

small farmers have to use made in China fertilizers which do not have any guarantee. Women small farmers like other small farmers they are accessible only to seeds and fertilizers within the market.

Table 20: Price of fertilizers

Particular	Price in Kyat	Remark
Pale fertilizer (one bag)	16500-20,000	7-10 percent interest if it is on credit
Compound (one bag)	30,000	

The price of the two main inputs: fertilizers and seeds are stable. But farmers have to use degraded fertilizer overtime. Farmers reported that the price of the two main costly in puts (apart from labor) seeds and fertilizers are stable for in 3 to years period. However, in reality farmers perceived that they used degraded quality fertilizers overtime. This means that the fertilizers with better quality that they initially used became low in quality but in the same price and the fertilizer with the quality good as initial one are higher in price. Farmers particularly medium and small farmers openly reported that the fertilizer that they used in fact are the ones they can sell on credit and the new Chinese brands tend to be sold on credit.

“The price is not different is not increased but I think the quality declined. What I mean is the same brand is the same price but in lower quality and if you want better quality then you have to pay more for the other brand with better quality which actually are the same quality as the one you used before”

(One of the farmers in Yaetar Shay)

6.2.2. Credit Market

The study found that credit market and credit availability found differed between different farming types as well as among villages of different water availability. As areal differences, interest rates are found differences in the two upper Myanmar Pale and Sint Kue than the lower ones in Tat Kone and Yaetar Shay.

Credit sources

MADB and input market suppliers are main credit sources...

The main credit source which is common for most of the villages except two in Tat Kone is the loans from Myanmar Agricultural Development Bank. The two villages in Tat Kone are very good in socioeconomic conditions and most of the farmers except small farmers do not take MADB loans which for them is very limited amount. Another common credit source of credit for all villages studied is fertilizer shops and dealers at the village which mostly are large farmers.

In addition to those credit sources, farmers also have to borrow from formal and informal money lenders resided at the township and the villages. Those credit sources are licensed pawn shops, informal

private money lenders and friends and relatives. Farmers took in cash mainly for financing in times of growing and harvesting seasons.

The higher in size of land holding the better in credit terms

Large farmers rarely borrow in cash apart from loans given by MADB and they only took fertilizers on credit. Medium farmers on the other hand borrow in kind from the fertilizer shops from the township or village tract and the interest is 3-7% seasonally (4 to 6 months season). In addition, medium farmers have to borrow from private money lenders whose interest rate is from 5% to 8% seasonally. The private money lenders who medium farmers especially depend on are those resided in township city or large or medium farmers who redistributed credit by lending those from the former. On the other hand small farmers are accessible to credit only at the village and they mainly borrow fertilizer from the village level dealers who mostly are large farmers. Small farmers rarely borrow in cash for growing and harvesting as they much rely on their own labour rather than hiring. Small farmers 2-5 acres can access credit like medium farmers as the above mentioned terms and sources. However, Small farmers with very small land holding (1 and less than one acre) on the other hand are to access different sources: credit of daily interest rate (10-15 percent) which in fact is the credit source mainly relied on by landless laborers.

Women have more limited credit sources...

Women farmers on the other hand rely credit from very close relatives. If they are to borrow from other lenders they usually take within village. But in many cases one of the influential persons from the village like VERPs are to be guarantor for them.

Table 21: Credit sources and credit terms by regions

Credit sources	Townships	Credit terms	Remarks
Fertilizer Shops	Yaetar Shay	3% (3-6 months seasonally)	Medium farmers largely rely on this sources
Fertilizer dealer in village	Yaetar Shay	3% interest rate plus higher price	The fertilizer priced 16500 Kyat in town is sold at 19500 Kyat. Small farmers mostly rely on this source.
Fertilizer dealer in village	Tat Kone	Fertilizer priced 24000 Kyat is sold at 30000 Kyat	Farmers in two other villages in this area rarely borrow as they are good in economic conditions.
Fertilizer dealer in the village	Sint Kue	7%	All large, medium and small farmers rely on that source.
Fertilizer dealer in the village	Pale	5%	7% in the village with bad irrigated water availability

Private money lenders (village or towns)	Yaetar Shay	4-10%	Those villages with bad water availability are 8 to 10%
Private money lenders (daily interest lenders)	Yaetar Shay and Tat Kone	10-15%	This is the credit source on which very small land holders and labourers rely.
Loans form cooperatives	3 villages in Yaetar Shay and 3 villages in Pale	2.50% to 3%	3 % is in Yaetar Shay. This loan is largely accessible by large and medium farmers.
Loans form army	2 villages in Yaetarshay	3%	This is also accessible by large and medium farmers_ some of them relend to small farmers and labourers for 8% interest rate
Licensed pawn shop	All areas	2-3% on gold collateral	If the amount is 1-3 lakh it is 3% interest and if it is over that amount the interest rate is lowers to 2%

Interest rates and credit less availability in villages with bad water availability...

The study found that interest rate is higher in villages with less water availability from irrigation than those with good water availability. The interest rate in the former villages are nearly double than that in the latter. For example: two villages in Yaetar Shay where the water availability is getting worse in recently years and the interest rate is raised from 5% to 7% while those in good village the interest rate is decreased from 4% to 3% for large farmers. In the same situations the interest rate for small farmers in bad water availability have been raised to 8% to 10%. Similarly in Sint Kue, while two villages with good water availability decreased in interest rate of private money lenders since 2008 from 10% to 5% while that in the village with bad water availability is 15%. People from the former village replied that people rarely have to take those loans even though the interest rate decreased to 5%. On the other hand, farmers in the latter village mentioned that credit is hardly available as they need even though the interest rate is high.

The perceived unequal accessibility to new credit sources was reported by small and landless labourers. One of the new credit sources_ the one from the army is found in two villages of studied and it was reported in one of it by small farmers and landless laborers that those credit sources are accessible to those who have personally close connection with the influential persons in the village including village tract administrators and some village elderly and respected persons. It is also reported

that the mentioned credit is accessed by some farmers at 3% per month and relend in the village at 8% interest per month.

6.2.3 Labour Market

Labour is shortage in most of villages in all four areas studied except those villages with bad water availability. The study learns that labour became scarce in most of the villages studied as farmers are more productive since provision of water from irrigation. In other words, improved access to irrigation enhance productivity of farmers and thus requiring laborers more. For example: farmers can utilize all of their lands when they have improved access to irrigated water while they have lands unsown because of unreliability of sufficient water in times of rain-fed farming system. However, labour shortage has been more obvious in Yaetar Shay and Tat Kone since five years ago because of the migration. It is reported by farmers in Yaetar Shay that the labours in their villages only cover 1/3 of the works in their village especially in times of summer paddy growing and harvesting. It is found that 7 out of 14 villages are being faced with significant labour shortage and all of them are good in water availability. Those villages always have to rely on labour from villages nearby or other area within regions. The other four villages are not bad and most of the time the labour within their village and the work are matched. Labourers in three villages with bad in water availability are to work in other villages even to other areas within the region because of the job scarcity in their village.

Organized labour groups exist in 9 out of 14 villages studied_ 4 are in Yaetar Shay and 4 are in Tat Kone and one village in Sint Kue. The organized labour groups are named as "Thoke" locally. There are 2-3 labour groups in each village and there are around 20 labourers in each groups. The labour groups are organized by group leaders who mostly are women. The leaders are acting like a bridge between demand and supply. The labour leader receives a wage for one labour as a service fee. For example: If there are 10 labourers organized for 30,000 Kyat to harvest an acre of farmland, then the group leader are to gain 6000 Kyat in addition to his daily wage 3000 Kyat. It is learned that the labour leader usually are inherited to their parents. As a result, the labour leader in one village is a male despite that most of the labour group leaders are women.

In Sint Kue Township two villages have labour broker who contacted labour groups in other villages as there are too few labour to be organized as a group. Those villages are located near the Mandalay-Mogkok road and not far from Mandalay city. So, those villages become urbanized and farm labourers became scarce. Most of the labourers are migrating and working for gold mines and logging.

Villages in Pale Township do not have organized labour groups and it is farmers themselves are organizing for labourers. Those areas in fact lack organized labour market and farmers depend on labour sharing. However, farmers have to depend on labour market since they grow paddy in 2007. Still, small farmers depend largely on the labour sharing.

The labour wages increased 25% to 50% within one and a half years...

It is reported that the labour wages have been increased 25% to 50% within one and a half years in all regions. Still, the labour wages in times of urgency especially in times of summer paddy, the wages in Yaetar Shay and Sint Kue increase 75%. The following table shows labour wages in general for all four

regions. The labour wages in the following table is general daily wages. The wages in reality are differed as per work types which is described in Gender section where gender separation of farm works are described.

Table 22: The rates of daily labour fees in four different regions

Township/Regions	Daily wage in Kyat 2012-2013	Daily wage in Kyat 2013-2014
Sint Kue (Northern Mandalay)	1500-2000	2500-3500
Pale (Southern Sagaing)	1000-1500	2000-3000
Yaetar Shay (East Bago)	1500-2000	2500-3000
Tat Kone (Southern Mandalay)	1500-2000	2500-3000

Farming holding size matters in accessing labour ...

Small and medium farmers reported during the study that they are not favored by labour market. More importantly, women headed small farmers are especially difficult. Labourers give priority to large farmers especially in times of growing and harvesting season. This is also because wages for growing and harvesting are to pay in sum per acre. For example: 25,000 Kyat per acre for growing or harvesting. So, the labourers can gain more money as more acres they are working on and thus not wanting denying offers from large farmers. This is not the problem for small farmers holding under 3 acres of land as they can depend on own labour. Those with 3 to 7 acres are difficult in finding labourers and worst of all are women headed small farmers who do not have labour to share.

Gender role of is changing in the labour market and gender separation in farm works declined...

The study found that the gender role is changing in the labour market. That means jobs done by male labourers before are now undertaken by women labourers and this is especially the case in Yaetar Shay and Tat Kone. For example: plowing is the work usually done by male labourers before and now it is women also do plowing because of the shortage of male labourers who especially make long term migration.

6.2.4 Product Market

The products are purchased directly by brokerage houses and rice mills in all villages visited. The buyers' representatives come directly to the village. This is only exception to beans and sesames in villages of Pale Township in which farmers have to sell at the township Market. The study found that large famers in villages with good water availability where socioeconomic condition is good, large farmers are seen as product buyers and traders who purchase product from their farmlands in times of the harvest and stored at home and sell when they get most favorable price.

Product Market is quite fair because of the competitiveness...

Farmers perceive product market is fair enough. This is because of the competitive buyers at the villages. They also access information from the township because of the cell phone facilities. As a result, farmers gain fair enough market price at their village.

“Several brokers (representative from the brokerage houses and mills) come to the village even before harvest season. We don’t need to go township. If we go there, the price is not different even less because of the compromising power decreased once we got to the township as we cannot take back our product. So, we sell only at the village”.

(Large farmers in Yaetar Shay)

The price of paddy is more stable than other crops such as sesame and peanuts...

It is reported that the price of paddy is more stable comparing to price of such other crop as sesame, peanuts and green gram and pigeon pea as the former is very good domestic demand and the latter depend much on the foreign market especially China and India.

Table 23: Price Table of different crops

Townships and Regions	Type of Products	Farm gate price in Kyat	
		2012-2013	2013-2014
Yaetar Shay (Paddy Price as per 100 baskets)	Thai Kauk	220,000 ²⁷	420,000
	Yadanar Toe	400,000	400,000
	Pale Thwe	400,000	400,000
Tat Kone (Paddy Price as per 100 Baskets)	Thu Kha	400,000	400,000
	Pale Thwe	450,000	500,000
Sint Kue (Paddy Price as per 100 baskets)	Ayeyar Min	470,000	500,000
	Shwe Thwe Yin	350,000	470,000
Pale (Paddy Price as per 100 baskets)	Lone Thwe Mwe	600,000	750,000
	Ayeyar Min	550,000	800,000

²⁷ The price decreased that much because of the bad crops because of the irregularly heavy rain in times of the harvest.

Pale and Sint Kue (Sesame price as per basket)	Sesame	2,700	4,000
Pale (Chick pea)	Chickpea	10,000	20,000

The size of farming holding matters in product market. Larger farmers are affordable to store their product until the price gone up or the products dried up²⁸ while small and medium farmers mostly are unable to do so.

6.3 Access to Irrigation Water

The study found that accessibility of irrigation water is main determinant to farming systems and that the socioeconomic conditions of villages with good availability differed from those with less water availability. Half of the villages studied only had “Ya” farming before they were benefited from the irrigation. The rest of the villages used to have “Le” farming which only grew one crop of paddy annually. The former are able to grow both paddy and other crops while the latter have been growing two crops of paddy since they have gained irrigated water.

However, the study found villages with bad water availability despite their inclusion in the targeted irrigation area of each schemes. The socioeconomic situations in those villages differ from those villages with good water availability with the exception of one village where farmers grow crops relying on tube water. One additional negative thing for villages with bad water availability is that they are growing other crops rather than paddy illegally. In fact, farmers there are supposed to grow paddy as their land are recorded as “Le” land since they are in the irrigated area. But in reality they do not receive irrigated water sufficiently and are to grow other crops as a result by taking tacit agreement of the tract and township level government.

The study visited 14 villages of which 6 are considered as good in water availability, 3 not bad, 2 bad and 3 very bad . Generally, those villages accessing to water from the main canal (MC) or direct outlet (DO) usually are good in water availability and those located medium distant from the main canals that is around 15 miles and accessible only to distributaries (DYS) are medium and those from the tail accessing irrigated water from minor or outlet of minors are usually bad and very bad in water availability. This means that the irrigation infrastructures canals and salutes etc. are not functional or are having error technically. Thus those villages even near to the main irrigation sources are not good in water availability. The following table shows situations of water availability depending on the distance from the main water sources.

²⁸ Dried paddy is given more price.

Table 24: Water availability as per estimated distance to the irrigation sources

	Good	Fair	Bad
Access to Dos and DYs	6	1	2
Access to Minors of the DYs		3	
Access to Distributaries of Minors			2

6.3.1 Villages with different levels of irrigated availability

Villages with good water availability are those accessing water from DOs or DYs. 75% to 100% of their farmlands are irrigated. They received water once the water is released from the dam. **In short, villages with good water availability are accessing water not only from the systematic irrigated infrastructure but also from spilled ways using different arbitrary means in order to get water to every single plot of their farmland as much as they wanted.**

Villages with fair water availability are those accessing water from Minors and the tails of DYs. Minimum 59% to 100% of their farm lands are irrigated. However, they only acquire irrigated water sufficiently for the monsoon season. This means farmers are receiving water only for monsoon paddy. In addition, farmers in such villages gain water not through systematic irrigation canals but through spilled ways. In other words, irrigated water to this kind of villages are coming mainly not from systematic water canal but through spilled ways and drainages from which people are seeking to fetch water using different costly means. **It is therefore, a lot of community collective initiations for getting water are largely seen in this type of villages.**

Villages with bad water availability are those accessing water from Minors and distributaries of the minors (only one village with bad water availability in Pale Township is exceptional as it access water from main canal). In villages with bad water availability 1% to 32% of the farmlands are benefited from irrigated water. Farmers in those villages cannot depend on the water from the irrigation even for the monsoon crops. **In fact, irrigated water is hardly seen for majority of farmers in this type of villages. As a result, farmers in this type of villages do not in fact have much expectation on water from irrigation. This means that irrigation with this canal system will hardly be available to them and thus they conduct their farming works without expecting on irrigated water²⁹.**

6.3.2 Farming activities as per availability of irrigated water

Villages with good water availability are able to grow two corps fully_ paddy or other crops in summer time. This kind of villages in Yaetar Shay, Tat Kone and Sint Kue grow two crops. Villages in Yaetar Shay

²⁹ This however does not mean they do not have expectation for rehabilitation of canal system. They want canals to be fixed in order for availability of water for them and they know that they can be more productive if they can well access to irrigated water.

and Tat Kone grow monsoon and summer paddy while villages in Pale grow monsoon paddy and such other crops ,and winter sesame or Chickpea. One of the villages studied in this Pale township even grow three crops. Villages with good water availability rarely experiences delayed in farming activities as they receive irrigated water once the water is released at every farming season begins. Given that farmers in villages with good water availability are able to grow crops in time, they are able to grow long tenure crops such as 110 to 120 days paddy which tends to have better price than short tenure paddy.

Table 25: Information on villages with good water availability

Villages	Area	Scheme Area	Estimated total farmland Acre	Irrigated area	Percentage Irrigated	Farming activities
Pyi Soe Aung	Sint Kue	Male Nattaung	150	150	100	2 crop of paddy
Pin Lal Gyi	Sint Kue	Male Nattaung	852	660	77	2 crops of Paddy
I Yaung	Pale	North Yama	1950	1900	97	3 crops (one crop of paddy and 2 other crops)
Inbetkone	Tat Kone	Sin Thay	370	370	100	2 crops of Paddy
Ingyinkone	Yaetar Shay	Swa Chaung	500	500	100	2 crops of paddy
Oakshit Kone	Tat Kone	Sin Thay	1200	900	75	2 crops of paddy

Villages with fair in irrigated water availability mostly are able to grow one monsoon crops only with the water from the irrigation. Only 1/3 to half of the farm lands in the village can depend on irrigation water for their summer crops. Farmers in these villages in fact expect water from irrigation for monsoon paddy in case the rain is late and insufficient for the success of the crops. Accordingly, this type of village can grow one crop fully that is monsoon paddy and they grow such other crops as green gram, bean, sesame and chickpea depending on mists. There is one exceptional case in which one village in Yaetar Shay is able to grow both monsoon and summer paddy. They can do this by acquiring water from spilled way through costly collective community actions.

Given that this type of villages receives irrigated water one and a half months after opening water from dam, farmers especially in times of summer paddy are not able to grow long tenure crops as they worry that harvest season and the rain will be conflicting. So, they have to grow 90-100 days tenured paddy. Worst of all, many farmers in this type of villages frequently experienced crop failures as they cannot grow all of the natured plants for summer crop as irrigated water is not good enough to feed the natured plantations. In other words, the irrigated water come at the initial stage of natured paddy plants and later it comes insufficiently.

Table 26: Information on villages with fair water availability

Villages	Areas	Scheme Area	Estimated total farmland Acre	Irrigated area (Acre)	Percentage Irrigated (%)	Farming activities
Kokko Su	Pale	North Yama	4500	4500	100	One crop of paddy and 2 other crops. Only monsoon paddy receive water fully.
Nyaung Lunt	Tat Kone	Sin Thay	860	510	59	One monsoon paddy and no summer paddy for 7 years
Phoe Kyar Nyo	Yaetar Shay	Swa Chaung	384	315	82	One monsoon paddy and only 1/3 grow summer paddy
Thapyay Tan	Yaetar Shay	Swa Chaung	1100	1100	100	2 crops of Paddy but 90% are depending irrigated water coming from spilled way

Villages with bad water availability in fact cannot get sufficient water even for the monsoon paddy. Thus majority of farmers in those villages depend on other crops than the paddy such as sugar cane, sesame, chickpea, green gram, cotton, chili and vegetables. There is two particular cases where farmers in this type of village grow paddy_ one is growing paddy on their Ma Yae land (silted land) while the other grow paddy thanks to the water from tube well. A few farmers who grow monsoon paddy

depending on irrigated water also experiences delay in their farming activities as the water reach 2-3 months later after the opening of the water in each farming season. Accordingly farmers can only grow short tenure crop in summer paddy.

Table 27: Information on villages with bad water availability

Villages	Areas	Scheme Area	Estimated total farmland Acre	Irrigated area (Acre)	Percentage Irrigated (%)	Farming activities
Ngwe Taung	Sint Kue	Male Nattaung	1700	20	1	Most of them grow Ma Yae Paddy on the silted land and they depend on Kyan
Mon Thwin	Pale	North Yama	1800	314	17	Majority of farmers depend on the “Ya” Land growing sesame, pigeon pea and peanut while they grow monsoon paddy on the “Le” land
Kyar Thay Ei	Tat Kone	Sin Thay	1000	315	32	Only a few people grow monsoon paddy. Majority are growing green gram, cotton, beans and vegetables with pumped water from tube well.
Kun Ohm	Yaetar Shay	Swa Chaung	1800	300	17	Grow monsoon paddy and the rest are growing Sugar Cane.

6.3.3 Constraints in accessing irrigated water

The study found various failures in irrigation system as well as disobediences of the rules and regulations by the communities. All kinds of failures are resulting in lack of or limited and delayed irrigated water. Regarding with the irrigation system failures, the study found several types: the water gates at the dam are having leakages, the canals topographical conditions are not relevant; the canals are not strong enough to stand the water speed; misplaced water gates; misplaced drainages, lack of systematic spilled ways,; and lack of systematic maintenance by the irrigation department. Regarding with disobediences of community the study revealed 3 main types: people' arbitrary use of irrigated water and infrastructure; failures in maintaining water courses; and unsystematic development of farmland boundaries.

System failures

Leakages in storage dams

This is reported in two schemes (Sin Thay and Male Nattaung) both by officers from the irrigation departments and the people in the communities. In Sin Thay Dam, the leakage occurred because of the rubber seals of the water gate at the storage dam. According to the officers from the irrigation departments it is learned that another 200 acres of farmland could be given water in times of summer crops if this leakage is repaired. This problem is mainly caused by low quality rubber being used as the seal Plus, only "elephant brand" glue is used to repair the seal problem. On the other hand, the leakage in Male Nattaung Dam is with concrete floor of the storage dam.

Misadjust gravity in canal system

People in 8 villages reported this kind of problems. It is the gravity error in canals (DVs and Minors) reported in 7 villages while in one village it is the water courses' gravity error. Irrigated water cannot pass well throughout the canal because of this problem. With this failures in canal system, the canals are broken in several areas and losing water. With this problem, water is coming through drainage and spilled way as opposed to formal irrigation infrastructure. As a result, farmers are accessing water from drainage using different means.

Canals are not strong enough and easily broken

This problem also is largely reported especially by people in 8 villages. In most of the cases people blame earthen canals for not being strong enough to stand the water coming through or human actions as they could easily destroy canal to block water ways. This problem finally posing obstacles to the water coming throughout the canals and finally resulting in

Water Gates and sluice problems

This is reported in three villages studied_ in two villages, the water gates are misplaced while the other villages is in need of one water gate where they think it should be.

Drainage problems

The drainage problems are reported in three villages. In two villages the drainage is not strong enough against water flow causing floods in farmlands. In another village the drainage is misplaced and water lies between the canals and the farmlands resulting in flowing water through the drainage as opposed to the canal.

The canals posing as obstacles to the natural water ways coming from the hills

In two villages, it is reported that the canals are in the positions deterring the water coming down from the hill in times of raining season. The canal thus broken by the water coming from the hills and farmlands are flooded.

Lack of repair and maintenance by irrigation department

People largely reported this kind of failures. It is reported that DYs and minors are not regularly maintained or repaired by irrigation departments. When the people asked for the services from irrigation department, they most of the time were responded that the department was not able to repair because of the budget limitations.

Disobediences of irrigation rules by the community

People's arbitrary use of irrigated water and infrastructure

The study found that people are taking irrigated water arbitrarily using various irrelevant means. And this is especially worse in villages with good water availability. In one village with good water availability the SA study team witness that people are taking water from canals, water courses and spilled ways using side pipes. In one place it is seen water is taken across the village road thus destroying the road. In this case people are trying to get water to every single plot of their land.

People in almost all villages studied use different means in order to get more water to their farmland. Taking water by placing various types of obstacles such as wooden plate, soils, and stones. Those materials are placed at the water gates. People used 8 inches pipe in appose to the places where 4 inches pipe are to be used. In two villages, people give informal money to people from the irrigation department to give water 6 acre-feet instead of 4 acre-feet which in fact is considered enough for the farming activities by irrigation department.

People's unsystematic building of farmland boundaries

It is also reported in a few villages that the water courses could not be maintained straight because of the people's unsystematic development of farmland boundary. This also the one of the reason by which irrigated water cannot be passed well and resulting in delay of the water. **People's failures to make regular maintenance**

Farmers in half of the villages are found failed in regular collective maintenance of the water courses. This largely degrades water courses rendering gradual misalignment. In this way, water delivery finally delayed for the farmland located at the tail of the water courses.

6.3.4 Socioeconomic differences on differences in availability of irrigated water

The study found that there are socioeconomic differences between villages with good and bad water availability. Researchers reflected their observations on differences of the two villages with different availability of water that living conditions and assets holding are much better in villages with good water availability. They have better and newly built homes and such assets as motor cycles and tailors and so on. People also mentioned that their living conditions are much higher than before.

“We farmers in this village before never have eaten good quality rice. Sometimes we have eat boiled rice when we only have “Ya” farming which depends much on rain and weather. Now we can produce and eat best quality rice” (a farmer in a village of Pale Township)

Unpredictability is overwhelmed in villages with bad water availability. The study found that farming works for those who are not available irrigated water are very risky and unpredictable. They lately have been experienced with frequent losses of crops because of the late rain or irregularly heavy rain. The flowing cases reflect the situations of two different farmers in the same village_ one is available irrigated water and the other is not.

Case: How farming are risky with the lack of irrigated water

Farmers with irrigated water starts growing early monsoon sesame in mid April with irrigated water. Now they have harvested and received good yield and in fact better yield than last year because of the lesser rain in times of harvest. They receive 6-7 baskets per acres.

Farmers without irrigated water could not grow sesame until June because of the lack of rain despite that early monsoon sesame is to be grown in May so that the plants are continued alive with the rain in June, July and August. They can only grow in mid-June and now the crops are failed because of insufficient rain.

(When the SA research team visited the village sesame are grown full and greenery in irrigated fields of the village. On the other hand, farmers without irrigated water looked sad as they cannot grow anything because of the late rain. Now, according to phone interview with those villagers, farmers who are available water responded happily about their good yield of sesame while other farmers replied sadly because of the crop failures because of less rain.)

Farmers with limited availability of irrigated water do farming more costly because of the efforts to get water though water pumping or other community collective efforts (for more collective management see community water management section). The following cases show how farmers from the limited water availability from irrigation are seeking to get water to their farmland through water pumping.

Case: How farmers heavily cost to grow paddy through water pumping

U Ka Gyi is a large farmer who own 16 acres of “Le” and 16 acres of “Ya”. He grow paddy by pumping water from the tube well as the irrigated water is not guarantee not even for nurturing of monsoon paddy. However, small and majority of medium farmers are not affordable to grow paddy by pumping

water as the cost of digging tube well costs around 150,000 Kyat and there are also costs for fuel. He have to dig two tube well to give in order to give water to 16 acres of farmlands.

In 2013 he grow paddy in 7 acres of farmland and the reason that he cannot grow full acres he owned is he cannot afford to give water all 16 acres though pumping water especially because of the fuel costs. In 2013 summer paddy he has to pump water since nurturing plants through growing time using 100 gallons of fuel costing him 500,000 Kyat as one gallon of fuel is 5000 Kyat. In fact, U Ka Gyi is lucky in 2013 summer paddy season as he received irrigated water when the plants need final water for the success of the crops. Otherwise he has to pump water for that process also and cost another 100 gallon of fuel.

He found out that he lost 50,000 Kyat in that summer paddy season. He received only 45 baskets per acre which is only half of normal yield. This is in fact because of the insufficient water. This means the farmland did not acquire enough water like it did through irrigated water and resulting in low yield. His cost of production per acre is 250,000 Kyat and he earned around 200,000 Kyat per acre as he got 4500 kyat per basket. So, he lost around 50,000 Kyat per acre in that summer paddy season.

(A large farmer in a village with fair water availability)

6.3.5 Impact on social relations of limited water availability of irrigated water

Villages with less water availability especially those villages with fair availability of irrigated water have experienced frequent conflicts and tensions on competing irrigated water. They have intra and inter-village conflicts as they have to compete on irrigated water. Those who are closer to the water sources are acquiring water first despite the rule that those from the tails of the canals are to take water first. To the worse, those from the close proximity at the canals are taking water even at the turn of the farmers at the medium and far distance by blocking the water ways. As a result, farmers from medium and tails in times of growing season particularly of summer paddy, they as a group have to go the villages closer to the canal and talk to open water. Frequently, such situations lead to conflicts in which physical assaults occurred. Inter village conflicts are reported in four villages during the study. It is found that township irrigation departments have a role in solving all these reported conflict (see the case in the following section on community collective action) problems.

Intra-village tensions upon acquiring irrigated water are very common reported in every village visited. Those problems occurred mainly because of two main causes: plot to plot water distribution system and up canal and down canal water dispute problem. In both type of systems, the following problem occurs those who could access to water first deterred water in times of broadcasting or nurturing plant or ready to be harvesting and the down watercourse or plots are in need of water; and the former released water after his turn and making floods to the latter who entered water through other points as he cannot wait water from the former. In addition, the problem stealing water (stealing turn) also frequently happens especially in villages with no water user groups. Farmers are to watch their turn in night times as stealing especially occur in night times. But it is difficult for small women headed farmers to watch water in night times as they also cannot afford to hire a watch.

“We cannot sleep well in times of summer paddy growing season as we have to watch water in night times. Otherwise people steal turns” (a farmer in a village studied)

“I cannot watch water in night times as we are two women at home_ me and my daughter. So, we cannot do but let the people steal water turn” (A women headed small farmers in a village studied)

6.3.6 Community water management system

Systematic community water management system exists only in 6 out of 14 villages_ 3 villages in Sint Kue under Male Nattaung and another 3 villages in Tat Kone under Sin Thay. In those 6 villages there are water user group as per water course or direct outlet. The water user groups are called “Myang Kaung” group. The groups are headed by (canal head) Myaung Kaung and comprised of farmers using a certain DO or water course. So, there are 4 to 5 water user groups in each village. Myaung Khaungs in villages with water user groups are selected by farmers commonly using a water course or direct outlet. In one exceptional case in one village a there is one influential person who are acting as head of all Myaung Kaung.

In 5 villages out of 8 where there is no systematic water user group, there still have so called “Myaung Khaung”. But those Myaung Kaung are not influential enough to organize people. The rest 3 villages there are no even so-called Myaung Kaung.

Myaung Kaung are seen in effective role in water management in villages where there are systematic water user groups. Myaung Kaung in this kind of villages are having role as organizers and monitors. They organized farmers in their groups to clean or repair water courses and DOs before a crop season begins. In addition, they monitor water distribution in order that farmers are able to get water as their turns. Usually, Myaung Kaung give penalty to those who violated turns by not giving water for two weeks. The study found that Myaung Kaung in villages where there are water user groups are directly communicating with persons from irrigation department especially with SAEs and that there are close cooperation between them.

Those villages with no systematic water user group “Myaung Kaung Group”, only one person with the title of Myaung Kaung but he role is rather symbolic. In those villages farmers do not have regular maintenance of canals and water courses. It is village tract administrators and village administrators who mainly organize farmers to repair canals only when there are problems with it. According to farmers it is learned that the so-called Myaung Kaung are not influential on the villagers. In one village in Yaetar Shay, farmers insisted that they named “Myaung Saunt” (canal watch) instead of Myaung Kaung meaning he is not in the leading role.



6.3.7 Community collective actions in seeking irrigated water

The study found several cases of people seeking irrigated water in terms of collective community actions. Importantly, it is revealed that the absence of water user groups did not mean the lack of collective community action in seeking irrigated water. Most of those collective initiatives are led by

VERPs or village tract administrators. The study also found that former and current Myaung Kaung are plays a active leading role in those collective actions in both villages with the existence of WUGs or not. The study found collective community actions or initiations for accessing irrigated water or to get more water in 8 out of 14 villages studied. Those actions found during the study could be seen as 5 categories: building water gates collectively; digging canals and access water from other irrigation schemes or DYs; gathering people as a group and went to other villages tracts and talks to open water ways; requesting persons from irrigation departments in order to get more water or to get water to areas outside the targeted irrigation areas; and forming community water user groups and stipulate new rules accepted by community.

Case on category 1: building water gates collectively (this kind of community initiative is seen in two villages)

In one village in Yaetar Shay which access water from two minor canals of DY and one of them is not functional. However, the water was seen flowing in spilled ways. A large farmer who is formerly a Myaung Kaung whose farmlands are right next to the spilled ways and he realized that they could take water from the spilled ways by building a water gate across the spilled ways. So, he started building embankment on the spilled ways then he built a water gate. In order to build the whole process he also had to voluntarily give up 1 acres of his own farmland. 120 farmers of the farmland which could access water from the schemes are also organized and the scheme was gradually built taking nearly 10 years. The scheme so far costs nearly 80 lakh and each farmer have to make over 60,000 Kyat. The schemes now give water to 362 acres of farmland. Thanks to this community initiated scheme, the yield three times higher than before as it is increase 40 baskets to 100-120 basket per acre.

Case on category 2: digging canals and access water from other irrigation schemes or DYs (this kind of community initiations are seen in 2 villages)

Sin Thay Dam gives water depending on the rain availability in the storage dam. So, there are many villages especially those in the tail cannot get enough water even for the monsoon paddy. Kyar Thay Ei is one of those village. Kyat Thay Ei access to water from the distributaries of minor 8 of DY 1. However, water cannot go through to the parts of minor 8 which is on the up land part. So, farmers in that village are very much difficult water even for the monsoon paddy.

In 2009, one of the large farmers in that village who also is a former Myaung Kaung for many years in the village proposed the Agricultural Coordination Committee (ACC) when it came to the field to let them develop a canal accessing to the DY 1 directly. The ACC replied that if farmers could be organized on the cause they will give mechanical support. The he organized 35 farmers_ many of them were unwilling to the scheme as they have to give their land. But they contribute money in view of getting water. In this way the scheme was successful and now 150 acres are provided with water. The canal is 8 feet wide and 1 foot deep and also included road for carts. It only cost around 300,000 Kyat_ 200,000 kyat is for fuel costs for the machines from the irrigation department and the other 100,000 Kyat is compensation for a small farmer who has to give her land more than other people_0.05 acre. Accordingly, 35 farmers are to contribute 10,000 Kyat per household financially.

Case on category 3: gathering people as a group and went to other village tracts and talks to open water ways (this is commonly happen in several villages in Yaetar Shay area)

This is the collective activity locally called as “following the water”. Irrigated water receded in times of growing season and farmers are in trouble as they already have natured the paddy plants which would be a waste if they did not get water for growing those paddy. They know that where the problem was as this is not unusual one. Farmers in the village tract locate up canals are taking water arbitrarily and did not let farmers in the downward canal take turn. They already complained the issue to village tract administrator who could not solve the problem through negotiation with his counterpart. As a result he called the SAE from the township irrigation department and requested for help.

How they have to solve the problem was that farmers around 20 including women carrying mattocks and chopping hoes had to march to the village at up canal along the canal. The township ACC members also came to the village tract at up canal. There farmers found as they have already expected farmers at the village at up canal are taking water without their turn. So farmers had talks with those farmers from the other village tract with the support of ACC members. In addition, farmers clean natural and manmade barriers along the canals which they observed when they marched along the canal. And those clearances take around 20 days taking 20 farmers each day. The SAE and some other ACC members came to the field everyday and watch the canal cleaning process.

Case on Category 5: forming community water user groups and stipulate new rules accepted by community (this is very rare case and reported in one village)

In one village in order to solve the dispute related to irrigate water, they formed a water user groups called “water committee” with the initiation and dedicated supervision of a village elderly and respected person. They stipulated regulations that farmers from the up canals and down canals are to take water 5 days each. Two persons from the water committee monitors every days and give penalty to those violated the rule by not give water turn for two weeks. It is reported by the farmers that the system works.

6.3.8 Water Tax

It is reported that the water tax have not been collected for around three years since 2011. The water tax when it was last collected generally is 1950 Kyat but it was varied between monsoon paddy and summer paddy or sesame and paddy. In Yaetar Shay, Tat Kone and Sint Kue it was 1950 Kyat per acre for summer paddy and 950 Kyat for monsoon paddy as monsoon paddy did not need to give water as much as summer paddy which needs water across the season while the monsoon paddy needs only in times of nurturing time and sometimes before harvest. In Pale Township, it was 1950 Kyat for Monsoon paddy which needs to give much because of the arid area. And it was 950 Kyat for other crops such as sesame which do not need much water.

The reason for not collecting water tax is given differently by people and the persons from the irrigation department. People in fact do not know clearly why the service providers did not collect. Some perceived that the tax will be collected in sum every two to three years. Some people from the limited water availability areas insisted that they thought that the irrigation department dared not collecting as

they were not able to give water enough. On the other hand, people from irrigation department, expressed people's failures to give taxes. Many of them insisted that people are challenging the power of authorities in the democratic era and failed to take their responsibility.

"First one or two people failed to give and later other people failed to give as they thought that it was no problem if they don't pay...The water tax collection should be undertaken by the administration department_ township and village level administration should do that as people only care administration. In addition, the village administration primarily should the tax collection so they villagers cannot escape. The villagers avoid us when the collector from the irrigation department collected the tax. When the collector investigated a certain tax payer for example U Chit, U Chit and the collector personally met. But U Chit told the collector that U Chit is not at the village and traveling" (One of the SAE from Township irrigation department)

"The water tax is not collected this year. We have to pay 1800-1900 Kyat. I think the tax is collected every three year. I think they are not coming as they cannot do anything (to get enough water)". (Big farmer in a village studied))

6.4 Access to Extension Services

The availability of extension services varied in villages studied of four different regions. The study found that the best service is available in villages of Tat Kone where all three villages visited are closely given services by department of Agriculture. The rest of the areas reported that agriculture extension visited some villages especially village tracts and villages located road sides and that attentions primarily focuses on the policy crops.

Services in Tat Kone, the best among four areas visited...

All villages visited reported that the agriculture department gives close care on their villages. It is learned that every villages studied has agricultural outpost building where department in-charge (department manager) come frequently while 7 to 8 agricultural extension workers are visiting fields every day. They mainly are to care the project rice plantation "Pale Thwe" and "Thukha". However, they give advices whatever farmers need on their agricultural works. In addition to everyday services, the agricultural department gives agricultural training 3 times per season to both farmers and the labourers (Thoke groups). In those training, the agricultural department gives rope line transplanting method; the nature of seeds; and how seeds should be changed; the methods of using fertilizers, how to grow Pale Thwe and Thuka rice and so on. It is learned from the farmers that Thukha rice project is meeting farmers' needs and government's project. This is because Thukha is good in market demand and farmers themselves likes for their family consumption.

Farmers reported that the agriculture extension service not only give advices only on rice but also on green gram. First they encouraged farmers to grow green gram in early monsoon season. In one village, one of the large farmers who could be considered as model farmers first tested and other farmers later grow as the former is successful in growing.

In addition, it is reported that existence of extension workers at the village are very much supportive for farmers especially in times of pest as farmers can ask directly to the extension workers on suitable methods of killing a certain kind of pest. Plus, the labourers also apply rope line methods systematically as they were instructed because of the close supervision of the extension services.

Services in villages in Pale Township, the second best among four areas studied...

It is reported that the extension services reached to all three villages. But it has more frequent and regular activities in two villages which have more “Le” focused farming. It is reported that the manager of agriculture himself come to the villages frequently and have close relations with the villagers. In addition, agricultural trainings are given three times per crop season in the two villages. At the agricultural trainings such subjects as rope line methods, how seeds should best be natured to have through breed, the methods of using fertilizers, the soil types of suitable type of sesame and other crops, and methods of planting sesame, prediction of the weather as well as about Pale Thwe.

In villages of Sint Kue and Yaetar Shay Townships, services only come to tract village and villages located right beside main road...

The study revealed that the extension services in Yaetar Shay come to the villages nearby main roads. According to farmers in those villages where the extension service reach to the village, it is learned that the service only give its focus on the Pale Thwe project. One or two large farmers in their village give part of their farmland to grow Pale Thwe in response to the strong request of agricultural departments.

“The extension service only give attention to Pale Thwe after Pale Thwe. If they come to the village with the matter of Pale Thwe, we can sometimes rely on them for advices on such matter as anti pesticides methods” (A large farmer in the village in a village studied who also is a Tract Administrator).

The insufficient number of extension staffs in township agriculture department is one of the reasons of the failure of visiting field.

“There are 13 village tracts in the Township. There are 5 to 6 villages under per village tract. One extension worker is assigned to 25 villages and how he can go to every village. In addition, they also are to give attention on the Pale Thwe projects existed in villages right beside the main road. So, there is no time to go to village. In addition, the fuel costs to go to field largely are to be used by staffs’ own finance.” (Personnel from Township Agricultural Department)

Farmers in villages of Sint Kue Township reported that they heard that the extension service come to the village tract giving training which mainly talked about Pale Thwe. In one village in Sint Kue Township which is bad in water availability insisted that they have never heard about the service. The village has a few acre of irrigated area which grow monsoon paddy while the other grow paddy in Maye land (silted land) and sugarcane.

6.4.1 Attendance in agricultural training given by extension services

The attendances of farmers in agricultural training varied by farming types meaning interests are not related to specific farming type. However, it is learned the more male farmers are attending to the training with the exception of Tat Kone where women attendances are more than men because laborers are also to attend training. According to one of the persons from agriculture departments in Tat Kone mentioned that farmers are to be strongly encouraged to attend the training and sometimes they need to make such meetings sound more attractive, such as associating with agricultural credit.



6.5 Land

6.5.1 Land Tenure

Land certificates issued to farmers as one of the subsequent actions of 2012 Farmland Law are termed as “Land Use/Utilization Entitlement” and it is also seen that the owner of the land is the State. In addition, on the certificates, the region, township, the name of the farmer entitled to a certain farmland, the name of the field (Kwin Number) where it is located and the number of the entitlement (U Paing Number). The land type “Le” or “Ya” is also described on the certificate. It is also mentioned that the utilization entitlement is valid as long as the clause 6, 7, 8 of the land law are not violated. Plus, there is a map of the field and the plot is put on the certificate.

According to the farmers, village administrators and farmers, it is learned that land record department in most of the villages did not come to field and measured their farmland before they prepared the certificate. This is mainly because of the insufficient human resources in land record department.

“We cannot go to the field and measure the farmland in reality because of the insufficient people in our department. If we have to do so, the process of land entitlement will last for years”

(One of the township land record officers of the LRD)

“The process has been delayed because of the limited human resources; it is only one district in-charge (at DLRD) to scan and signs for those thousands of applications”

(One of the village tract administrator)

It is also reported in one township that farmers who have made land transactions asked persons from the TLRD to measure their land before the application process by giving some amount of money.

People perceptions on Land Tenure Security

People have general ideas on the new Land Law especially on that allows making transactions and transferable rights. But some still feel unsecured about their farmland. People largely praise for the transferable right and some mentioned its usefulness as collateral in acquiring credit. The study found in a few villages in Sint Kue and Pale Township that people used the copy of land tenure certificate in pawing land among farmers. Still people mentioned words of doubt on security of their land for the

land's ultimate owner is the state. The following quotes are reflecting people's opinion on the security of their land.

"We only have the land tax payment receipts before. Now it said we own the land. But it is only government which can determine and we are to be subjected whatever they do." (One of the farmers in a village in Pale Township)

"Money lenders seemed more willingly to pay with this paper³⁰." (a small farmer in one village in Pale township)

Many people especially women have little knowledge about the benefits of the new laws...

The study found that farmers in the villages studied have little knowledge about land law. It is found that farmers do not even learn what it reads on the land entitlement certificate. The following are the quotes on the mentioned case.

"I have never read the paper and do not know clearly what it reads on it. I did not read as it is nothing different and it is finally the government which will do as it like and we are to accept".

(a small woman farmer in Yaetarshay)

"I think it is more guarantee as it is a grant land but I never read carefully"

(a large farmers in a village in Pale)

6.5.2 Issues on Land

The study found land issues in two forms. The first type of the issue is land disputes. Land disputes are seen in 5 villages. Land disputes are seen in three types: land disputes related to land confiscations under the military regime in 1990s (2) land disputes among siblings and relatives (3) the land disputes related to farmland boundaries among neighboring farmers. The first type of land dispute was found in 3 villages, the second is seen only in two villages while the last one is commonly happens in every village studied. In one village, land dispute related to land confiscation is one of the issues posing delay in the process of land use certificates. Another type of land issue is that reclassification of the land types "Le" to "Ya" or vice versa are needed in several villages. One important thing is that SA found possible issues on land relating to land acquisitions relating to constructions of dams as the agricultural lands acquired have yet to be properly compensated.

6.5.3 Examples of land disputes that originate in the days of military regime.

Three cases of land disputes were observed during the field assessment, in the villages in Yaetar Shay and Sint Kue, as described below.

Case 1: Farmers in two villages studied started farming on the forest lands in the 1950s_ first informally and later by giving taxation and they have tax receipts. In 1986 the forest land transferred the land to Industry No 1 (government industrial ministry) which developed sugar factory and farmers

³⁰ This is the small farmer who lend from the big farmer in his village

working on the 1286 acres of farmlands were removed from those lands in early 1990's. However, there still were a lot of extra lands after building the sugarcane factory. Farmers were given 2 acres of farmland from those extra lands and the rest were taken by the army, township administration, the intelligent department, agriculture department. Those government bodies rented the land to farmers especially to large farmers. Now as the State declared return of the farmland, land disputes occur among three parties: government departments, the large farmers who rented the lands from the government and the former farmers. The disputed acres are 500 acres of land belonging to 14 villages of four village tracts. Around 20 farmers of the villages studied are involved in the case. But those farmland disputed are not in the irrigated area but in the irrigable areas.

(One of member of the village development supportive committee)

Case 2: Another case reported in two villages studied in Yaetar Shay is farmland confiscated for development of new villages mainly for the army families in the 1990s³¹. The confiscated lands are utilized as residential areas for army families and the rest are rented out to farmers for farming by the army. However, there no land disputes have occurred upon those confiscated land. But those lands are in the irrigated areas.

(One of member of the village development supportive committee)

Case 3: A village in Sint Kue reported 900 acres of land confiscation by the government for biodiesel plantation project (Kyet Su) which was followed by cotton project. Later the lands are taken by the army and rented out farmers through auction. When land returned recently, disputes emerge between former land users and those who used land by renting land by auction. There are 15 farmers from the village visited involved in the disputes. It is learned that 30 acres of 900 are in the irrigated area.

(One of the members of Land Management Committee)

How this land confiscation issues are being addressed

For the case 1, the three parties of dispute complained to Central Land Management Committee and the issue is in a dead lock and any of the party is able to utilize the land. No reclamation case come up in case 2 and according to respondent, it is learned that people dared not making any disputes on the land. The two parties of disputes in case 3 complained to the Land Management committee. Currently, the land management committee at the township us investigating the case and the village level land management committee is in a role of gathering evidences by investigating the two sides of the disputes.

The study team also found land disputes that originate when the study irrigation schemes were built

³¹ The data is not available on how much acres of lands are confiscated.

North Yama Scheme

No land acquisition or physical displacement took place when the main dam built. But 6 villages were relocated when an associated regulating dam was built. The entire village population was relocated in three of the six villages removed. The Government relocated all displaced people from the 6 villages in one newly built village called Aye Chan Thar village, and the irrigation department helped the construction of new village and relocation of the displaced people. The village has roads and electricity; however, the government did not provide alternative agricultural land fully.

Male Nattaung Scheme

The residents of two villages were physically displaced when the main dam was built. The two villages were resettled in the areas beside the main dam with the assistance of the irrigation department. Very small agricultural lands were acquired during land acquisition and those land have not been compensated. But people are tacitly allowed to grow crops in the drawdown areas and fish in the dam which supplement their income.

According to one of the members of village tract land management committee members, it is learned that government arranged resettlement of the two villages removed by the dam construction in the agricultural land by acquiring agricultural land of other farmers in the same township. People displaced from the first two villages were given fees for the movement and gave transportation for the movement. No other compensation was given nor resettlement of any confiscated agricultural land.

Sin Thay Dam Scheme

Residents of nine villages were physically displaced when the main dam was built. Both agricultural and residential lands were acquired. About 700 households reportedly moved to a newly developed village called Aye Chan Thar village, while about 800 other households chose to remain in their original villages since they still have sufficient residential and agricultural land and are allowed to farm drawdown areas and fish in the reservoir. All displaced households who moved to the resettlement village including landless were reportedly provided alternative residential and agricultural land. The landless and small holders received 0.5 acre and those with large lands received 2 acres. It is not clear if the alternative land given was sufficient enough to fully restore the livelihood of displaced people.

Swa Chaung Scheme

7 villages were displaced when the main dam was built and some agricultural lands were acquired as well. Displaced people were provided a residential space not very far from the reservoir and cash to cover the cost of the physical movement to the new residential space, but were not given alternative agricultural land or costs to build houses. Many of them reportedly are still without agricultural land or secure means of livelihood. Those affected people with sufficient residential and agricultural land remain in their original villages and reportedly gain additional income from employment at the hydro station, farming in drawdown areas and fishing in the reservoir.

As mentioned above, many people were displaced without proper compensation when the four study irrigation schemes and the dams that supply water to them were built about 10 – 15 years ago³², and

³² See the table 1.3 for details on the construction of dams.

that livelihood remains to be fully recovered for many of them. Of particular concern is that, many displaced people, including those who were displaced when Swa Chaung dam was built, reportedly do not still have agricultural land of an adequate size and quality, or other secure sources of livelihood, and their livelihood is vulnerable. The study team did not come across active complaints from the displaced people on the past land acquisition,³³ however, there is a risk that the sense of discontent among displaced people may erupt once the project starts rehabilitating irrigation schemes which take water from the dam and the main irrigation canals.

6.5.5 Reclassification of farmland types from Ya to Le and vice versa is required...

The study found that farmlands in villages in Sint Kue and Pale Township are now Le growing paddy with the irrigated water. But some of those lands are still recorded as “Ya” land. People are now trying to change that in order to get more loans from MADB which give 100,000 Kyat per acre for “Le” land while it is only 30,000 kyat for “Ya” land. This reclassification are also one of the cases by which land use certification processes are to be taken time as it requires the LRD to scan by measuring the farmland. It is also reported that farmers have to pay 5000 kyat to LRD to come and measure the land.

“The land is to be reclassified as “Le” land so that we can get 100,000 Kyat of loans from MADB. We will ask the LRD to come and measure the land in order to do so. We have to give 5000 kyat to LRD to come and measure the land” (one of the farmers in Sint Kue township)

On the other hand, farmers in two villages studied insisted that they want to reclassify their lands from “Le” to “Ya” land as their lands cannot grow paddy for not having irrigated water. They are now currently other crops such as sugarcane, sesame and beans with the tacit agreement with the government. As a result, they want their land classify as “Ya” land if they are not benefitted from irrigation. Another village in study also has been faced with similar case despite that they do not mention about reclassification of land into “Ya”.

Case 1: In one village in Tat Kone Township, 400 acres are under the irrigated area but only 200 acres are benefitted irrigated water. So, farmers want 200 acres to be reclassified as “Ya” land to grow several multiple crops freely with the tube water.

Case 2: In another village in Tat Kone Township, 630 acres are in the irrigated area and 120 acres are not benefitted irrigated water. Farmers as a result grow such crops as green gram, cotton and other vegetables with the tacit agreement of government authorities.

Case 3: In one village in Sint Kue Township, 69 acres of land are in the irrigated area but only 20 acres are benefitted from irrigated water. In fact, those lands are classified as “Ya” land in the record in or LRD. But farmers are supposed to grow farmland since they are included in the irrigated area. So, farmers in times applying land use certificate they want those land classified as “Ya” land as they want to grow sugarcane freely.

³³ The exception is the farmers in North Yama schemes who destroyed some of the canal system built because they initially did not receive sufficient water from the irrigation and did not want to risk growing paddy with insufficient water. An associated dam was built in 2007 which resolved the issue of insufficient water and farmers now farmers welcome the irrigation and want the scheme to be further developed

6.5.6 Land Sold to Outsiders

Several land selling cases in villages located at the roadside near Nay Pyi Taw and Mandalay) are reported. In the villages located right beside the main road near NPT and Mandalay are priced 10,000,000 to 20,000,000 Kyat and it is heard that business people are purchasing those land. The price of farmlands near NPT and are increased because of the development of the inter-regional highway road and encroachment of urban areas of Nay Pyi Taw and Mandalay cities.

Given the better accessibility, the business people become interested in investments in the mentioned areas. According to people in villages studied in Tat Kone (near NPT), some business people purchasing those land are interested in organized farming. It is reported that the Government is interested in expanding integrated farming, facilitates changes in land titles and provides mechanical and technical support. It is reported that three similar cases happened in one of the villages studied in Tat Kone and another two villages. The business people purchased 50 to 100 acres of land for the mentioned purpose. In Mandalay on the other hand, business people who purchased road side farmlands mostly developed private gas stations. There is only one case reported that a Chinese investor purchased over 100 acres of land and developed modernized farmland where he grow water melons and rice. No similar other cases happened after that.

Still, the interests of the business people are higher than the farmers' selling of their land. Only three cases of land purchase by outsiders for the development of mentioned business is heard during the SA study. This is because farmers also do not want to sell their land despite that the prices increased many times than several years as they want to wait and see if it is increased more. **One important report however is that the "Ya" land and non-irrigated "Le" land located right beside the road in NPT and Mandalay are sold rather than the irrigated land.**

6.5.7 Land Improvements Schemes

The SA team assessed three land improvement schemes: a scheme in Yae Aye Village in Tat Kone Township (Nay Pyi Taw), a scheme in Ah Lyin Lo village and another scheme implemented with the funding of JICA located near Ah Lyin Lo village in Zabu Thiri township in Nay Pyi Taw. People who participated in different schemes as well as the personals from irrigation and agriculture departments who oversee and implemented different schemes were consulted. In addition, the SA teams met some villagers who participated in other land improvement schemes including one in Khayansat Kone village in Tat Kone township and another which is locally called 288 field located near Ah Lyin Lo village. The scheme in Yae Aye village is in Sin The Dam irrigated area and the other one in Ah Lyin Lo and JICA³⁴ are in the Nga Lite Dam irrigated area. One scheme in Ah Lyin village was implemented in 1993 and the rest of the schemes studied were implemented very recently between late 2013 and 2014. All schemes recently implemented by government are similar in methods of organizing the community, implementation techniques and qualities but the scheme in Ah Lyin Lo and the JICA funded scheme are different. One thing that is common is that farmlands owned by farmers from more than one village are involved in each schemes.

³⁴ The so-called JICA land improvement scheme is located near Ah Lyin Lo village. The JICA scheme was built with the funding and macro management (that this organizing and negotiations with the beneficiaries) by JICA

Ways of organizing the community

All land improvement schemes recently conducted by government used similar method in organizing the community. People are organized by township level personals from irrigation departments, farm mechanization department and land record departments and township administrative departments. They came to the village and talked about the schemes especially the advantages of the schemes and how lands were to be given up and redistributed. Such meetings are usually conducted twice in each village and people had to give their signature in the second visit if they agree with the scheme. They had to sign and give name on the paper titled the "list of farmers agreed to the land improvement schemes". According to farmers, any specification on how to implement the land improvement schemes was not described on the paper of agreement. But in one agreement in 288 scheme, there is one clause describing that farmers agreed to give their land at a negotiated specified rate if some part of their farmlands existed in other people's at the time lands were redistributed. For example, if small size of someone farmland supposedly 0.4 acres are to be included in another one's farmland in order for systematically structuring the land and convenience, then the former has to sell their land at a price predetermined before the scheme started. In JICA scheme, the price was predetermined as 3,000,000 Kyat per acre. So, the former farmer has to sell his land for 1,200,000 Kyat.

Ah Lyin and JICA funded schemes used different approaches. Ah Lyin scheme started in 1993 and was implemented without taking any agreement with villagers. On the other hand, the scheme implemented with the funding of JICA applied different methods of organizing the community. The persons from JICA themselves came to the village and organized the villagers. They first met the village formal and informal leaders (village elderly and respected persons, member of Land management committee and development support committees) of different villages where land improvement schemes were to be implemented. After making several meetings with village leaders, they met general villagers and acquired their consent and opinion. At the meeting villagers demanded to implement the scheme in a good quality especially the leveling of the land and building water courses strongly and that they agreed to skip one farming season in order to better level the land and water courses.

Implementation and land redistribution

All of the schemes are one acre plot development with the exception of scheme in Ah Lyin Lo and the other one in Yae Aye. Ah Lyin Lo one is 0.5 acre plot and the other one is a little short of one acre that 43200 square feet³⁵. The scheme generally constitutes leveling land, development of water courses to feed water to all plots equally, and development of products roads. In order to build those additional infrastructural such as access roads, farmers would exchange plots which may well result in some farmers losing more plots than others. Farmers normally accept a small loss in farm land if it results in the improvement in productivity and income. Technically, farmers do not contribute cash for land improvement schemes.

Advantages of Land improvements: Advantages of the land improvement schemes were stated mainly by farmers in Ah Lyin Lo village. Farmers are satisfied with the schemes because of more efficient

³⁵ 43560 sqft is equivalent to one acre.

production. According to farmers in Ah Lyin Lo, précised large (0.5 acre) plots of the schemes make them easy to hire labour and to use machines. Products roads also make them convenient to sell their products and that the SA team observed that the buyers truck came and collected the product right beside the farming field. Farmers in the other village only insisted that the purpose of the schemes is really good if there is no complication in reality.

Realities and constraints of land improvement scheme: The common limitations of the scheme is the quality of the schemes implemented by government especially in land leveling and building of product roads, earthen fences and water courses. According to farmers, land leveling is not level enough to grow crops and thus requires them to level it by hiring labourers and machines from government. The product roads also are not strong enough to bear the water coming down from the hilly during raining season. Similarly canals also are not strong enough when irrigated water coming.

One common challenging point for all schemes is redistribution of the land after implementation. In all schemes, participating farmers reported that significant negotiations were required in times of redistribution of farmlands as farmland cannot be regained as they were before the scheme. The SA found two forms of management on land swap and give up: one is negotiation and another one is purchasing some areas of land which is included in somebody else's original land. The price is predetermined before the implementation started by making negotiation among farmers. Another way is to negotiating for places with the help of village and township authorities. It is reported in two schemes of problems in land redistribution that is some farmers' disagreement with the land holding size of redistributed land. They claimed that the original lands are larger than the redistributed despite that they agree with the size of the land they have to give up for building product roads and canals. It is in fact difficult to resolve this kind of problem because the SLRD could not make specific measurement of land during land registration process.

Another challenge in land improvement schemes was negotiations with people doing different type of farming. For example in the scheme called "288 field", there are flower planters and they did not want to participate in the schemes as their farming is of different types from others. Finally, it was decided not to include them in the schemes and the problem was settled. But it is not always easy to settle such problem in this way. This time the problem was solved by letting flower growers to quit from the scheme as their farmland are locating at the edge of other people's farmland.

SA found one of the schemes visited is incomplete and revealed that incomplete schemes render people's distrust on the scheme as well as possibilities of problems in redistribution of farmlands. It is learned according to the persons from Department of the Irrigation that the land improvement scheme in Yae Aye village was only half completed that is the scheme was realized on half of the farmland participated in the scheme because of the insufficient budget. The implementer however returned farmlands to farmers who own much of the area of the completed part of the scheme.

Farmers in Yae Aye village reported that there are problems in redistribution of farmlands and with quality of the schemes. Given that land improvement schemes are based on calculations of aggregate measurement of all lands participated in the schemes, land redistribution have to be made only when

the whole schemes completed so that deduction of lands for areas of product roads and canals and subsequent negotiations and compromising could be done feasibly. Now, farmlands from completed part of the schemes were returned and some farmers did not accept reallocated farmlands insisting that the size of the farmland should be larger than the one returned even if it is proportionately deducted. Finally they demanded more lands and implementers gave some more lands in order to settle the problem quickly. But other farmers whose farmlands are on the incomplete part reported that they have concerns on the fair redistribution of farmland if other farmers from completed part did not accept redistributed farmland and demanding more.

In addition with the mentioned problem, villagers in Yae Aye village reported that the quality of the schemes was not good enough for growing crops. They perceived that this happens because the scheme has yet completed. The product roads and the canals systems especially are not strong enough.

One of the common concerns with the land improvement schemes according to farmers from villages either under current implementation or not, is on growing policy crops that is Pa Le Thwe which is the high yield paddy encouraged mainly by the Minister of Agriculture and Irrigation. People reported that Pa Le Thwe despite its high yield, is limited in market demand as well as not the taste of farmers. Farmers who have experiences growing Pa Le Thwe in Yaetar Shay and Tat Kone reported that they have to search buyers for Pa Le Thwe while the buyers come and collect at the village for other type of paddy with good in Market. So, farmers from other villages where the scheme not yet implemented reported that they worried that they have to grow Pa Le Thwe if land improvement schemes were implemented at their villages.

6.6 Indebtedness

Indebtedness amount of farmers are higher than before since they grow summer paddy or paddy since they gained irrigated water. However, farmers in good water availability are able to repay. On the other hand, villages with bad water availability are difficult to repay and become using such coping as migration and land selling. When we look at the indebtedness amount of different types of farmers it is learned that the indebtedness amount of large farmers in Tat Kone and Sint Kue, the two areas of less abundant water than the other two are higher and thus surmising that this is because of their higher costs in pumping water.

Table 28: Average current indebtedness amount of different farmers by regions

Township	Average Indebtedness amount of Large farmers in Kyat	Average Indebtedness amount of medium farmers in Kyat	Average Indebtedness amount of small farmers in Kyat
Yaetar Shay	760,000	600,000	430,000
Tat Kone	1,500,000	500,000	700,000
Sint Kue	1,100,000	560,000	360,000

Pale	700,000	660,000	360,000
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The following table shows the indebtedness amount of farmers in villages with different conditions of water availability. It is shown that farmers of from villages where water availability is not good (fair or bad) have much higher indebtedness than those from good irrigated water availability.

Table 29: Indebtedness amount of villages of different water availability

Water availability situation	Average Indebtedness amount of Large farmers in Kyat	Average Indebtedness amount of medium farmers in Kyat	Average Indebtedness amount of small farmers in Kyat
Good	460,000	400,000	250,000
Not Good	1,280,000	720,000	540,000

Landless labourers are never free from debt...

Landless labourers reported that they have never free from debt despite that they have less credit source. They mainly are indebted in kind to farmers, the grocery shops and their labour head. Their average indebtedness amount is between 10,000 Kyat to 50,000 kyat. They in fact are in the debt cycle even though they can largely repay with their labour.

6.7 Migration

More migration has taken place in almost all villages regardless of situations of irrigated water availability. However, the nature of migration seemed differed among villages with good and bad water availability which determines a lot on people’s socioeconomic conditions. The study surmises that people in villages with good water availability tend to migrate for capital intensive and skill intensive works while those in bad water availability goes for labor intensive works.

The first type of migration is seen in four villages with good water availability in Yaetar Shay, Tat Kone and Sint Kue. People in Yaetar Shay and Tat Kone of this type go abroad to such countries as Thailand, Malaysia and Korea while those in Sint Kue (Mandalay) migrate for such works as gold mining and illegal lodging in Shan States and areas within the region. Some of them in those areas also go for such skill intensive works such as mason and carpentry in big cities like Yangon, Mandalay and Nay Pyi Taw.

The second type of villages is seen in four villages of bad water availability in Tat Kone, Yaetar Shay and Pale Townships. People in those villages migrate for such kind of labour intensive works as in construction sites and gems mines and helpers in restaurants in Shan, Kachin and big cities like Yangon and Mandalay. In this case, men more migrate than women and they go for long term and thus rendering social impact on their families. Researchers have seen several cases of women headed

households inflicted by this phenomenon_ husband migrate long term far away from home and happen next marriages and leave their wives and children at their home village.

In one village of this kind, women mainly migrate and they do for intra-regional farming works. They migrated seasonally during the growing harvesting seasons taking 2 to 3 months in each time.

Still, the study found very low migration in 4 villages_ two of them are villages of bad water availability and the remaining two are good in water availability. Job opportunity as labourers in stone mines in their neighboring area favors labourers and even small farmers in one village of Ngwe Taung not to go to migrate to areas further away from their village. Few people in another village with bad water availability because their village have multiple crops depending on pumping underground water. People in another two villages in Pale rarely migrate as their village as farming works in their village is good enough to give jobs to labourers in those villages.

6.8 Vulnerability

6.8.1 The vulnerable described by the community

The most vulnerable groups that the community first and foremost described commonly are of three types:

1. landless laborers who themselves are not able enough to work as they themselves are sick or, looking after sick spouse or bed ridden old parents
2. the landless labourers who have few people in the family to earn money but many dependent especially several children
3. Small farmers and medium farmers who only have to rely on “Ya” land with less than 5 acres of farmlands especially in Sint Kue and Pale Township

The study found that the above mentioned families are seen worse off if it is a women headed families. The community mentioned that those families did not meet ends and that they frequently experienced skipped meals. There are 2-3 households in each village studied. One important findings is that vulnerable women headed household separated from their husbands are seen in villages with bad water availability where people both men and women are to migrate for works. But men migrate further in the country for longer term works thus resulting in making new settlements with next marriages and women at native home are finally left.

In Sint Kue and Pale, there are significant number of farmers who have to rely on “Ya” land only. The study found that those farmers particularly small farmers are vulnerable because of the less climatic regularity since 6 to 7 years ago. They frequently experience crop losses especially because of late and insufficient rain. Small farmers unlike large farmers do not have much land or investment by which they can grow multiple crops so that it can be covered if one crop losses. Researchers also agree that those farmers are also vulnerable apart from the first two categories.

6.8.2 The vulnerable groups who could be covered by study

The communities in the villages studied described other vulnerable groups apart from the above mentioned vulnerable groups. The following groups are seen as the vulnerable according to the researchers' reflection based on the community's description and observation:

3. Small farmers especially women headed small farmers with less than four acres of land in bad water availability villages
4. Small farmers who make share cropping in bad water availability villages

The above mentioned groups are being experienced with high risk and less earning from growing paddy because of the low guarantee with the lack of enough water. They have natured plants at the beginning of each monsoon season in view of receiving water from irrigation. But they did not in reality and they lost their seeds and labour cost. For large farmers as people with strong investment, they could rely on pumping water for the successful nurture and later the plants can be alive when irrigated water comes. Women small farmers are more vulnerable because they have less labour while other small farmers can earn better from labour when they lost their nurtured plantations. In addition it is difficult for them to migrate as they have to look after their children. So, they have to depend on works given by their village which earned much less than farm works. In addition, women are also less able to seek water availability like men who can watch their water turn while women cannot. As a result their farmland could easily be affected by less water availability.

The rehabilitation in canals which will enhance water availability will significantly decimate the vulnerability of the second type. Given that the rehabilitated canals will bring water in times of need, small farmers who have labor will make more sharecropping from those larger farming households who do not have much labor as the water guaranteed strongly for the success of the crops. In this way, smaller farmers could be more profitable with increased earning. As water will be equally available, there will not be the case where women headed holds losing water as they could not watch their turn and their farmland will also be more productive.

The rehabilitation of the canals however will not be tangibly reducing the vulnerability of the first categories. Still, if the project is based upon the social inclusion framework, social and economic vulnerability of the first vulnerable groups later could be reduced.

6.9 Gender

6.9.1 Population of Women headed households

The average number of women headed household in villages studied are 16 which is 6% of the average population of the 12³⁶ villages studied in four regions. However 5% of them are considered as most vulnerable women headed households as they are small and landless families. When we analyse the number of women head households as per different township, it is learned that more women headed households are found in villages of Sint Kue (Mandalay) and (Yaetar Shay) comparing to villages studied in the other two regions. Villages where capital and skill intensive migrations have higher

³⁶ Data on women headed households is available only for 12 villages.

women headed households. The following table shows numbers of women headed households as per livelihood.

Table 30: Women Headed Households as per livelihoods by four townships studied

Township	Avg. Number of Large farmer WHH	Avg. Number of Large farmer WHH	Avg. Number of Large farmer WHH	Avg. Number of Landless labourers WHH
Yaetar Shay	2	4	2	11
Tat Kone		4	7	7
Sint Kue	13	6	3	14
Pale	3	5	3	6
Total Average	4	5	4	9

6.9.2 Gender in farming activities

Gender-based division of labour in farming works become less important in all areas and particularly in Yaetar Shay because of the labour shortages. The study found that women have to take more different roles in farming because of labour shortage and migration of men. It is also found that women get the same price as man laborer if they could do the same type of works as male. The nature of the gender role in farming differed between the villages located in two parts of the country: upper country and lower country. In this context, Yaetar Shay and Tat Kone are in the lower and while the other two Sint Kue and Pale are in the upper. The following table show gender role in farming activities by different regions.

Table 31: Gender role in farming work by two parts of the country

Farming activities	Gender		Remarks
	Yaetar Shay and Tat Kone	Sint Kue and Pale	
Plowing	Male and Female	Male	In Yaetar Shay and Tat Kone This works before are conducted by males
Broadcasting seeds/Pull-off nurtured plants	Male	Male and Females	Pulling off natured plants in fact needs masculine strength

Planting	Male and Females	Male and females	
Weeding	Used weeds killers	Females	In Yaetar Shay and Tat Kone, people used weed killers instead of human labour because of the labour shortage
Spreading Fertilizer	Male	Male	Farmers insisted that males done better in spreading fertilizer than women as they can spread farther and know better in measurement.
Spreading pesticides	Males	Males	Most of the people do not want to work this kind of work because of its terrible smell. This kind of work is suitable more for male because of the need to carry a heavy container
Clearing and renovating water courses and embankment	Males	Males	
Harvesting	Male and female	Male and Females	
Carrying the products	Male, female, children		Before it is only male are doing this kind of work

6.9.3 Women and inclusion

Women are not found in key institutions and decisions role of the community. The study revealed that women are not seen as members such key village institutions as village administration, village development supportive committee, village land management committee. A few women are seen as

members of water user groups but no woman is seen as the leader of the water user groups. Women are seen as leaders of the labour groups called “Thoke” groups.

The study however, revealed that women are included in the village mass meeting on behalf of their husbands. However, it is learned that they are not fully conceptualized the main subjects of the meetings. Women insisted that they went to the meeting on behalf of their husband and they did not clearly understand the subject. In one instances, women who attended the meeting on Land improvements gave their signatures for their agreement on the land improvement schemes without knowing clearly about the subject. The following quotes reflect their situations.

“Yes, I signed the signature as other people also did. When I returned home my husband asked me why I signed the signature and I told him I did as other people did. And my husband blamed me strongly for signing without understanding. He also worried that our land will be lost under the schemes” (a small farmer in Yaetar Shay).

6.10 Institutions

6.10.1 Village level institutions

There are generally six village level institutions in each village: village administration, village elderly and respected persons (VERPs), Socio-religious, fire brigade, red cross and maternal and child welfare associations. In addition to those 6 general institutions there are village development supports committees, Land management committees, water user groups, loans and credit committee, committee formed by aid provider exist in differently among the villages studied. Village development support committee and land management committee usually exists in tract village. Those two organizations exist in 9 tract villages visited. The following table show more detail on the existence of the different village level institutions.

Table 32: Types of different institutions being existed in villages studied

Particular	Number of villages	Remarks
<ol style="list-style-type: none"> 1. Village administration 2. VERPs 3. Socio-religious 4. Fire-brigade 5. Red Cross 6. Maternal and Child welfare 	14	These 6 organizations exists in 14 villages studied commonly
Village development support committee	9	Only at tract level villages
Village land management committee	9	Only at tract level villages

Water user groups (Myaung Kaung group)	7	3 in Tat Kone, another 3 in Sint Kue and one in Pale
Single purpose groups (electricity or road committee or school committee)	2	One in Sint Kue and another in Pale
Loans and credit	5	Cooperative credit 5 villages, Pact Myanmar in one village in Sint Kue

6.10.2 Analysis on the role and functions of village institutions

Village administration

The study found as the most active and functional institutions of the village generally. In tract village, the village administration is headed by tract administrators while it is the hundred household leaders that head the village administration in the villages under tract village. The village administration is formed with village tract administrator/100 household leaders, a clerk and 10 household leaders.

The village administration is as usual the only organization with key decision making and organizational power in all villages. Still, this power is reinforced by VERPs in most cases and in a few cases by Buddhist monks. Being entrusted authorities from the state and reinforced with the support of VERPs and monks, the village administration in all villages visited are seen as most powerful organization in the community.

It is the village administrator who mainly is communicating with the outside township level state institutions. In many villages except those where water user groups are systematically formed, it is the village administrator who primarily deal with the persons from irrigation department in making effort to get more water for their village as well as handing disputes on the irrigated water.

Village Elderly and Respected Persons

This informal traditional institution remained influential as before. It is the VERPs who reinforced the authority and power of the village administrator in organizing community. Given that VERPs are being informal and traditional in nature, it is influential and active as personality rather than as institution. VERPs tend to those who are large farm holding, wealth and other assets. Plus, in most cases they used to be former village formal authorities or working for state related institutions such as cooperative and irrigation departments. In all villages, VERPs are seen as chairperson or members of village development support committees and Land Management committees. They also are involved in dispute settling of the village administrators. More importantly, VERPs are seen as leaders or initiators of community collective actions not only for water but also for village development schemes such as electricity, roads and school facilities.

Socio-religious groups (Tharyae Naryae)

This is the group where VERPs and youths are working together for social and religious works. This is a traditional informal but active institutions in all village studied. The group takes responsibility of social occasions such as weddings and funeral; and religious occasion as donation ceremonies (Ah Lhu) and prayer ceremonies. This institution could be seen as the social wing of key players of the village that is VERPs. However, youths in this group are later tends to be village core leaders of the village.

Village Development Support Committee

This committee is formed recently with the instructions of the government. In fact this is the village tract level institution formed with five members. Usually, one of the VERPs of the tract village is seen as Chairperson and secretary and members are of the villages under the village tract. They are selected at the village level by village tract administrators, VERPs and 10 household leaders. The selection at the tract level is to be endorsed by the township administration.

The study found that the village development support committees in most village tract study are not functional and so-called. The village development support committees in 2 out of 9 villages are found active. In one village, it is the active youth members of village development support committee are mainly working while it is the VERPs in another village under the name of village development support committee are working for village development schemes such as electricity, roads and schools. On the other hand in the remaining villages, it is only VERPs and village administrators are deciding and undertaking village core affairs. It is revealed in several villages that members on the development support committees do not know each other or remember other members of the same committees meaning their functionality is in doubt. The following quotes reflect the reality witnessed by the researchers in the villages studied.

“The village development support committee is formed with the endorsement of the township authorities. The VERPs on the committee are even listed at the township. Two VERPs from this village (tract village) are included. Whatever organizations are formed it is the VERPs who mainly decide on any matters in which financial expenses are included” . (70 year old former village leader in socialist era)

“I am a secretary of the village development support committee as they (village tract administration) said. But I don’t know who are the other members” (Secretary of a village development support committee in a village studied))

One important finding is that the chairpersons of development support committee tend to be a VERP or a person from a village tract. This seemed the village tract administrator select a person from his village with his preference with the purpose of more efficient working. However, people from the villages under village tract reported that the funding provided by the parliament for community development (the 1000 lakh fund from parliament) went only to the tract village and some blame the fact that chairmanship of the development support committee exists in tract villages.

Land Management Committees

The land management committee is also a village tract level institution and formed with five members. Unlike the village development support committee the village tract administrator take positions as chairperson position and members are administrative clerks, clerks from Township Land Record Department, one VERPs and one farmer are involved as members in the committee. The VERP and a farmer member are selected by other VERPs and 10 household leaders as well as by village tract administrator. Like development support committees, the tract land management committees are also not active with the exception of two cases seen one in Tat Kone and another one Sint Kue. In one village in Tat Kone it is reported that a land disputes between in-laws were sloved by the tract land management committee. On the other hand the tract level land committee is seen in a role of evidence gathering than deciding on the land disputes between two types of farmers competing for possession on land confiscated by government (see a cases below).

Case 1: How village tract level land management committee solve the land dispute

The land dispute happen between a widow aged 25 and her in-laws when the widow was about to sell the land inherited from her husband's parents. She had to sell the land to repay debts owed for the medical expenses of her husband. At this point, her husband's family reclaimed their lands and they complained to the land management committee of the tract composed of the members from three villages. The land management committee in fact took the role of negotiator rather than making judgment. Finally, the widow is given the home and compound on which she lived with her husband and family. In addition, she is provided two acres of land by her in-laws for future livelihood of families. The negotiation took over two years. The widow is satisfied with the results and her in-laws also accepted the negotiations of the land management committee.

Case 2: Village tract land management committee as a role of evidence collector

One of the villages reported 900 acres of land confiscation by the government for biodiesel plantation project (Kyet Su) which was followed by cotton project. Later the lands are taken by the army and rented out farmers through auction. When land returned recently, disputes emerge between former land users and those who used land by renting land by auction. There are 15 farmers from the village visited involved in the disputes. The village tract land management committee is now meeting with the two parties of the disputes and taking evidences and hand over those evidences to the township level land management committee. A member of the land management insisted *"we are not in the position of making any judgment or decisions on those disputes. We are only gathering evidences by meeting with parties of the disputes. We then have to hand over those evidences to the township level land management committee"*.

Water user groups

See the Access to irrigated water section.

Semi-State institutions

Such semi state institutions such as fire brigade, maternal and child welfare associations and red-cross exist in every village visited. They however are not active and not having regular activities.

Loan and credit associations

There are two types of loans and credit associations are seen in six villages studied. The so-called “Cooperative loans” are seen in all 6 villages and one loan scheme of Pact Myanmar is seen in only one village studied. Both of the loan schemes required to form peer groups in order to get loans. Anyone can be member regardless of gender. However, it is largely reported by the poor people that they largely are not accessible to those loans because it is difficult for them to be members.

6.10.3 Inclusion in the village level institutions

Generally, the poorest of the poor and women are not seen in the village core institutions as well as key decision making of the village. When we look at village administration, the village tract administrators are large farmers while the poor are involved as the 10 House hold leaders. Similarly, village development support committee and land management committees are formed with VERPs mostly are large farmers. In those three organizations, ethnic minorities and religious minorities are not seen as members. One exceptional case however is that Shan ethnic in a neighboring village of the village studied are seen as village tract administrator of that village.

On the other hand, farmers of all types are seen in the water user groups and small farmers are also in the position of Myaung Kaung. In addition, religious minorities are also seen as Myaung Kaung in two villages_ one is studied village and another is a neighboring village.

Any women however are not seen in any of the above mentioned village institutions despite their participation in credit and loans groups especially in Pact Myanmar. Still, vulnerable women and poorest of the poor reported that most of them cannot enter as members in those loans groups. They reported that those loans are largely managed by village tract administrators and those affiliated to them are included as members. On the other hand, the village tract administrator responded this claim of the poor that the very poor cannot be included as members because they are instructed to give loans to those who could be guaranteed to make repayment. The following case reflects the exclusion of the vulnerable women from institutions in the community.

Case: How vulnerable are marginalized in the community

Ma Ka Gyi is a 37 years old widow who has a 17 years old daughter and 14 years old son. Recently, she sold her house for the school expenses of first year university for her daughter and she finally stayed with her poor mother. She earned a living as a laborer in times of farming season and earn from selling snacks. There is a microfinance group in their village funded by Pact Myanmar. She learned that 23 women member group_ each saves 500 Kyat per week and membership fees is 300 Kyat. Only members can borrow money for 5% interest rate. She told the financier of the group who is the wife of the village tract administrator to enter the group. But she never has a chance to enter despite that she was told if

one member leave the group. Now several persons leave the group but she has yet to enter the group. She can't do anything but to accept. She expressed to the researchers that they are just very poor people and are not cared by people. They rarely can borrow money in the village and that is the reason she want to enter microfinance group but she is not accepted.

6.10.4 Inclusions of Ethnic and Religious minorities

The SA found insignificant population of two ethnic minorities_ Karan in Shan in Yaetar Shay Township of East Bago within the irrigated area of Swa Chaung irrigation scheme. Both are living in mixing with majority Burmas and they are assimilated into Bamars speaking Burmese.

The SA found that the Karen people are not included in any of the village institutions. The reason for not participating in the village institutions according themselves are that they are not interested in participation in village institutions. This could also because of their very limited population in the village residing only 3 household of Karan people in the whole community. Regarding with the Shan people, the SA team found that the village tract administrator of the village is Shan. However, the SA team did not have a chance to investigate their other participation in other village institutions of the village. The SA found that the Islamic minorities are in the role of Ten Household leaders and Myaung Kaung organizing the people in their sect.

6.10.5 Township level institutions

The study found four township institutions as key stake holders relating to the project: the irrigation department, agricultural department, and land record department. In addition the researchers learned about an institution called Agricultural Coordination Committee which initially known as an institution formed with the integration of the three mentioned township level institutions.

The irrigation department

Structure and number of staffs of the township irrigation departments are varied. The number of staffs in the departments of irrigations in four townships are minimum 21 to maximum 110. The following the general structure of the township irrigation department.

Structure: Township Irrigation Dept.

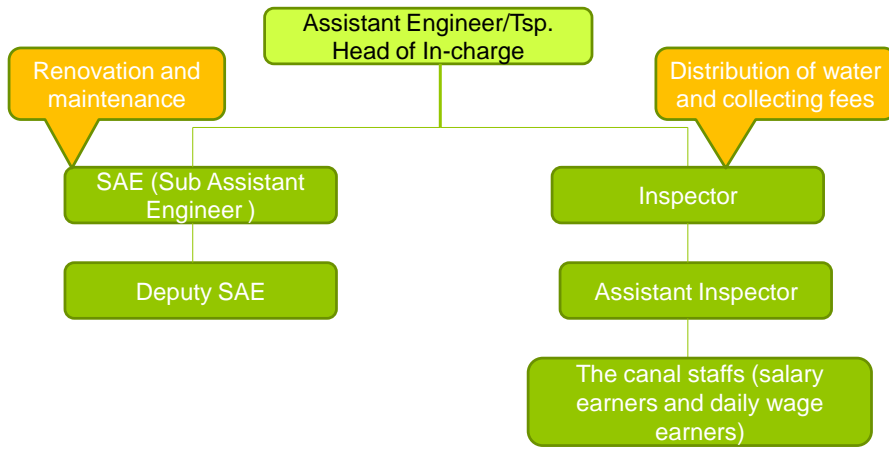


Table 33: Number of staffs in township irrigation department

Township	Total number of staffs
Yaetar Shay	21
Tat Kone	110
Sint Kue	27
Pale	41

Challenges for the irrigation department

There are technical problems in irrigation system and lack of technical support...

According to different level of personnel of irrigation department, it is learned that the irrigation system of the dams built during the 1990s' under the military regime has many technical flaws especially in the canal system. This is because of the then policy of the Minister of Agriculture and Irrigation to built one dam each month of the year. In this way there were over 100 dams were built within over a decade. But the most significant part of irrigation system that is canal system could not built well.

“There were 130 dams built within 130 months according to the policy that one dam had to be built in each month. But the canal system was not systematically built. When the dam opening ceremonies done, the machines were moved to other dams and only 2 to 3 machines were left for canal building and thus

posing constraints to build canals systematically” (one of the high lever personnel from irrigation department)

Conflicting of interests with the executive branch, one of the obstacles in enforcing Irrigations rules...

In addition to those factors for technical defects of the irrigation system, personnel from irrigation department expressed some important reasons for not having enforcement of irrigation rules and regulation. **Some are because of the executive orders during the military regime to take some actions and schemes which was against technical and civil rules of irrigation.**

Case 1: In one township, it was reported by the people that the former regional commander want to give irrigated water to 2000 acres and it is only 63 acres were missing to fill that number. So, a canal was built in a place of technical error and thus resulting in frequent floods of farmlands as the canal was broken whenever strong water coming down from the hill.

Case 2: There are irrigation rules that irrigated water are not taken by using side pipe and pumping. But when the minister came, they asked why some of the farming plots were not grown and let farmers grow crops by pumping. So, those are causes by which irrigation rules cannot be enforced.

Case 3: The minister let to grow crops right beside the canals as extended acres. And it is difficult for us to repair canals.

Insufficient staff also is a constraint...

It is reported by one of the township irrigation departments that the number of staffs are not enough for them and that they cannot hire canal staffs because of the budget limitation. The canal staffs currently are paid 65,000 to 80,000 Kyat per month. It is learned the 75% of the staffs are reduced with the lack of budget.

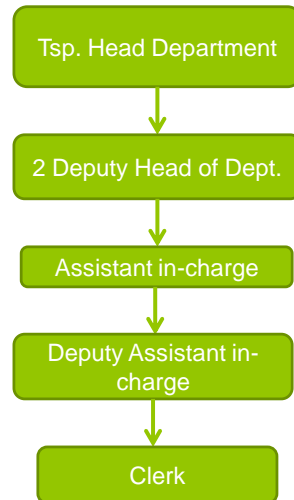
Agricultural Department

The number of staffs in township agricultural department also varied among different township. According to one of the head of departments of township agricultural department that township agricultural department has to be formed with 36 technicians and 3 other staffs and total is 39 members. However in reality there are maximum 29 and minimum 11 members in townships visited.

Table 34: number of staffs of township agricultural department of townships

Township	Total number of staffs
Yaetar Shay	11
Tat Kone	29
Sint Kue	12
Pale	29

The Structure of Tsp. Agriculture Dept.



Challenges of township agricultural department

Insufficient number of staffs at township agricultural department is identified by two township agricultural departments. Personals from township agricultural department insisted that their appropriated staffs cannot be appointed in all of their departments with the lack of budget. The following quote of a person from township agricultural department is reflecting their challenge.

“We have one head of department. There are two deputy head of department are to be appointed by there is now only one. The appropriated assistants are 9 and currently only 2 are appointed. There must be 24 deputy assistants but only 7 are appointed. We cannot appoint one junior clerk but we cannot so far now. In our organizational structure, there are 31 staffs but now we only have 12 staffs.”

Implementation of ministerial policy

It is reported by township agricultural offices that most of their human resources and time are consumed largely by the modeled plots where Pale Thwe are grown whilst they are insufficient staffs and resources.

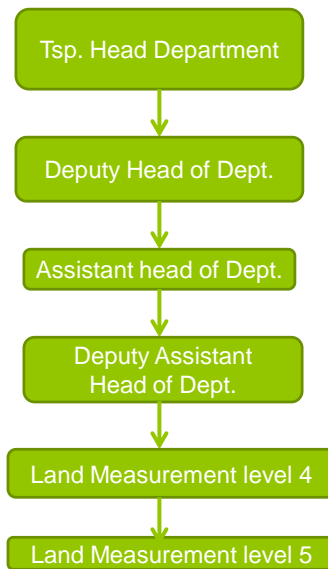
Settlement and Land Record Department³⁷

Settlement and Land record department’s several functions at the township level: to make land registration; to categorize land types “Le” and “Ya” as well as classification of soil qualities; to to monitor

³⁷ The study do not get much information from the township land record department because of the time limitation despite that the researchers had a chance to meet with three township head of department of land record department.

which type of land with a certain class of soil produce what type of crops with how much of productivity; and development of new cultivation areas if it is not large. The following is the organizational structure of township SLRD. In addition to the described technical staffs, there also are office staffs such as accountants 1, 2, 3 and two typing clerks.

The Structure of Tsp. Agriculture Dept.



Township Agricultural Coordination Committee (ACC)

According to personals of township level Agricultural, Irrigation and Settlement and Land Records departments, it is learned that ACC in fact is township level coordination body being composed of four departments: Township Administration, Township Agricultural, Irrigation and Settlement and Land Records departments. Usually, the coordination body is headed by the township administration, and the head of township agricultural department is secretary. The role and functions of ACC is learned as follow:

- Planning agricultural activities based on the land and water availability
- Working for the promoting productivity and high yield
- Solving emergency issues regarding with the agricultural activities for example floods
- Solving conflicts regarding with irrigated water occurred among different villages

ACC according to the conversation with heads of three township departments is not a body with specific functions and regular activities. The ACC in fact do not have regular meetings. In fact, members of ACC only meet at biweekly and especially monthly township administrative meetings together with other

township departments such as police, justice, and customs and so on. According to persons from three township departments of ACC in Yaetar Shay, it is learned they are more personally close like friends.

However, the study found that the ACC in Tat Kone are well functioning with the formation of sub-ACC based on five outpost offices developed within the township. In each outpost office, one department head is taking in charge and deputies of other departments, field in-charges of agriculture department, village tract development support committees of nearby tract villages are formed as sub-ACC. They meet every Sunday early morning and have discussions with farmers in the area on their difficulties and needs. The following case shows how people can be accessible to the three township institutions for their needs and three departments coordinate to address the possible floods in time.

Case: How ACC is working in coordination in addressing problems for the people.

A new railway was built recently in the farmland area posing deterrence to the pilled way. Farmers concerned put forward the issue in one of sub-ACC meeting at outpost office and proposed a pipeline connecting to the spilled ways. In response to this proposal of farmers, the ACC made observation shortly. Then they reported to the township administration and took permission to take necessary actions in coordination among three departments of ACC. The land record undertook necessary land measurement and irrigation department provided mechanical and technical support. In this way, the problem of farmers was solved in time before the monsoon paddy season.

Section 7: Results of Free, Prior and Informed Consultations

7.1 Who we consulted at the community

In acquiring people's opinion on the project, the SA research teams consulted three categories of stakeholders at the community level: Socioeconomic groups i.e farming and landless laborers, the vulnerable and members of village institutions. Regarding with the socioeconomic groups, the SA researchers meet with large, medium and small farmers; and landless labourers. As to the vulnerable, the SA researchers met with small women headed households; very poor landless laborers families, and farmers with small land holding whose families are bearing a burden of disabled or old sick people. SA researchers met with members of village institutions such as village administrations, water user groups (Myaung Kaung), village development support committee, land management committee, labour groups and so on.

7.1.1 Consultation with Non-Bamar population

Free, prior and informed consultations were carried out with ethnic and non-Bamar people in the villages studied or nearby villages. The SA researchers interviewed 5 non-Bamar people and 8 Islamic people. This seemed very small portion comparing to the total respondents, however, the initial desk review and the assessment of demographic data in the irrigable areas collected through literature review and interview with knowledgeable people indicate that there are few ethnic people in the irrigable areas of the regions.

Ethnic and religious minorities met by SA researchers in the study irrigation areas

Karan people: There are four households of Karan people in a village with 195 households in Yaetar Shay. They are related and living in one compound. They had been there in that village for 3 generations since their grandparents. They are small farmer families. SA researchers met 2 people of them. They insisted that they are assimilated to the community and lost their cultural practices such as spiritual beliefs and homage. They do not speak Karan language.

“We are now just four families here and no more like Karans. We don’t do Karan’s spiritual practices. We become Buddhists. We also do not speak Karans as well.” (a Karan respondent)

Shan People: Shan people that SA researchers met during the study are not from the village studied. But from the nearby big village tract called Mhan Si which is a village with over 200 households. Shan people in that village are 10 households and all are large farmers. The current village formal leader also is a Shan national. They had been in that village for 3 generations since their grandparents. The SA researchers met 3 Shan people including Village Tract Administrator_ 2 males and one female. The respondent stated that they are very much assimilated to the Bamar people and considered themselves as Bamar. They also do not speak Shan.

“We are born and grown up here. We went schools here as well. So, we do not feel like we are Shan. Our relatives in Phyu told that there are Burmese from Swa coming.” (A 50 year old Shan in Mhan Si village)

Islamic People³⁸: The SA researchers met Islamic people in two villages_ one is in a village studied in Sint Kue Township and another is a neighboring village of a village studied in Tat Kone. The SA team met 8 Islamic populations_6 medium farmers, 1 small women headed farmers and 1 large farmer who also is a Myaung Kaung. They are resided there for many years_3-4 generations. There are nearly 100 households of Islamic population in a village studied in Sint Kue while the other one in Tat Kone is Islamic as a whole village. All Muslims responded during the study are considered themselves as Muslim Bamar. Section 3: Findings of the Social Assessment: Socioeconomic information

Ethnic screening should be carried out during implementation under FS against eligibility criteria under OP 4.10...

The ethnic minority people interviewed generally maintained that they are fully assimilated with Bamar culture. In-depth analysis was not carried out under this SA to determine whether they meet the eligibility criteria as Indigenous Peoples under the Bank’s Operational Policy 4.10. It is recommended that an ethnic screening should be carried out as part of FS for the area of influence of project irrigation schemes and land improvement pilots, in order to determine if IP communities that trigger the policy are present in or have collective attachment in the project area of influence.

³⁸ Islamic people are considered as non-Bamar by most Bamar people despite that some Islamic people including those the SA teams met during the study consider themselves as Muslim Bamar.

7.2 Peoples' opinions on the project

7.2.1 Renovation of the Irrigated canals and building watercourses

People in the villages studied generally welcome the scheme on renovation of the irrigate canals regardless of different farming types, ethnicity and religions. Almost all of them expressed their cooperation on the schemes. The most common remark heard from the people is to make sure that the canals good enough to get water and they will cooperate if it is so.

Most of the people recommend renovating the canals in bricks and concrete. More importantly the study revealed that small farmers especially those 2 acres and less unlike other farmers have concern on the giving up land when water courses are built. However, some villagers including VERPs and administrators insisted that the canals map are already drawn and there are water courses and canal areas are already described and this is also acknowledged by farmers and that there will be no problem building water courses or enlarging the canals. The following are the quotes of the villagers on the schemes:

"The bricks and concrete canals will be the best form and water courses are to be built systematically."
(Karan Ethnic small farmer in Yaetar Shay)

"If canals are to be renovated, it is should be built with bricks and concrete so that people cannot break to steal water. But there should be a 12 feet wide bridge across the canals so that farmers will not break the canals to get to the road" (a medium farmer in Yaetar Shay)

"If we will get water enough, we are willing to give our land" (a small farmer in Pale Township)

"Renovating the canals as a project systematicall will be good. We can give land for the water courses."
(A large farmer in Sint Kue)

"We will give our land for the water courses which is essential for changing the plot to plot distribution system" (A small farmer in Sint KueTsp)

"It is good that renovating the canal. But make sure that farmers do not need to develop canals. Before, the irrigation department only marked the canal area and it is the farmers who have to dig it." (a large farmer in Pale Tsp)

Despite that most of the farmers responded are welcoming the development watercourses, some of them are recommending to carry out with careful organizing strategy and some also considers for compensation for the land giving up in the development of watercourses. And some showed their concerns that the water courses are gradually eroded and thus causing their farmland erosion.

"Water course development is good and we want to contribute our land but if the course gradually eroded and will affect our farmland, there will a problem" (a small farmer in Sint Kue)

Labourers in the village are also welcome the scheme pointing out that they can have more job as large farmers are benefiting. Villages with limited water availability can now only grow one monsoon

crop surely and they sometimes have problem even for this monsoon crops. As a result, laborers in those villages are to migrate or much less paid works during summer.

“If irrigated water available because of the better canals, we will have more jobs. Now our village grows one crop of paddy and we have to work for tobacco smoke makers we earned only 700 Kyat Per day (they earned 2000-2500 Kyat when they have farm works)”. (a women laborer in Tat Kone Tsp).

Despite those welcoming expression in all of the villages studied, one village in Sint Kue Township under the Male Nattaung Dam expressed their concern on the project despite that they want to have good canals. This is because they have suffered from building a DO 4 A which is attached to the right main canal of the Male Nattaung Dam. According to the villagers, it is learned that the DO 4 A in fact have a technical problem as it was built against the water ways of the hills and whenever there is water down from the hills with strong speed from the hills, the canal is broken and spoiled the farmland below. In addition, despite that the canal is built to give water to 63 acres of farmland, in reality, it is only 20 acres are benefitting. Worse of all, farmers who used to grow sugarcane before the existence of DO 4 A had to remove their sugarcane plantations on their farm and were instructed to grow paddy because they are under the irrigation scheme. However, in reality they were not benefited from the scheme. Farmers had profound lost since their sugarcane plantations were removed as they in fact were making profit from sugarcane. Since that time the village experienced has economic downturn. So, farmers in that village have strong concern on the scheme which they worried is that they will be negatively impacted from the scheme. Farmers openly expressed that if the project cannot make to get them irrigated water, they prefer removing the current DO 4 A which gave them trouble. The following are the quotes of their concern regarding with the scheme.

“Those farmers who are close to the main canal will be benefiting. It will be great if people from irrigation department are to carefully make to get water to those at the tails”. (Small women headed farmers in Ngwe Taung Village).

“If the canals cannot be fully repaired, then the canal (DO 4A) should be removed”.

(A Large farmerin Nge Taung village)

People from non-irrigable areas have expressed concerns on negative impacts of irrigated areas. One of the Karen leaders residing in East Bago who were consulted on the existence of ethnic people in all irrigable areas in the region, reported they have experienced floods which is perceived to be the effects of one of the irrigation scheme called Moe Yon Gyi Lake which feeds water to farmlands in Yangon region. They have frequently experienced floods as spilled ways from that irrigation schemes and others are not good enough to absorb water particularly in the raining season. As a result, the people in the areas suffered floods in both residential and agricultural areas in raining seasons and they suffered the worst floods within over 20 years this year.

7.2.3 People point of view on the water tax

Many farmer respondents want to pay water tax. More importantly, people from the villages with bad water availability want to pay more than current amount on the condition that they receive

enough water. They want to pay more for better services as those people have to cost over 200,000 Kyat per acre when they grow paddy by pumping water from tube well. According to most of the farmers it could be remarked that the current amount 1950 Kyat or 2000 Kyat is fair enough price. Some people also expressed that they want to pay 1.5 times more than the current amount that is around 3000 kyat per crop. However, many small farmers mentioned that they want to pay not more than 2000 Kyat. They commonly insisted that they do not want to cost on own initiated measures if they have to pay more on the water. The following are quotes of different views on the water tax.

“If we are not trouble on irrigated water we want to pay water tax around 3000 Kyat” (a large farmer in Yaetar Shay)

“2000 Kyat per acre is fair enough because it will be difficult for those who have more acres of land” (a medium farmer in Yaetar Shay)

“If we have enough water we want to pay 3000-5000 Kyat” (a medium farmer in Yaetar Shay)

“If we get water enough, we can pay 5000 Kyat per acre” (A small farmer in Sint Kue who grow paddy by pumping water)

Some of the farmers told the water tax is collected for 3 years and thus posing a burden for the farmers. And according to the persons from irrigation departments in Yaetar Shay it is learned that the water tax soon will be collected for three years and that this time the township and village administration are to be taken responsibility of collecting water tax. If it is so it could be a burden for farmers. The following is the quote reflected to their burdens:

The water taxes are to be given every 3 or 4 years and I remembered it is over 70,000 Kyat one time. We don't know exactly who collected....Many farmers did not give at that time as the amount is high. But they were not taken action because may be they could not give enough water. (One of the big Women Headed Households and other people in her family in Yaetar Shay)

7.2.4 Right of Way

The Right of Way³⁹ is specified as 75 feet each side from the center of the main canals; 50 feet for DYs and 25 feet for the minors. The study found that people generally acknowledge about the right of Way. However, they do not know exactly about the exact distances of Right of Way area. Persons from land record department also stated that the land entitlement given to the farmers excluded the canal areas.

It is reported in Sint Kue Township that there are land marks beside the canal marking the areas under the irrigation area and that people are growing crops despite their acknowledgement that the area is part of the canal right of way. However, almost all of the farmers insisted that they will remove their crops from the area when the canals are renovated. In Pale Township, farmers themselves told that the irrigation territories and are already on the Map and that farmers are to remove from those area when

³⁹ The Right of Way is termed in Burmese as “Sae Myaung Nae Namate/Sae Myaung Area”. And the people also locally used that word.

the canals are renovated. At the same time some of the farmers told that they will remove from the canal areas during the renovation and will grow their crops after the renovation. Farmers mentioned about the time most convenient for them to remove from the right of way when the canals are renovated that is the after harvest time before water provision time of each season.

“There are crops in right of ways; we have to remove when it is renovated. But after monsoon crop time is good for us, that is October to end of November” (medium farmers in Yaetar Shay)

“There are a land mark and sign board for the right of way but farmers are growing crops around it” (a large farmer in Sint Kue)

“Most of the areas of right of way are not free from crops. People grow crop despite the knowledge that they are not to do so. But they will be fine if we explained well” (Village tract administrator in Sint Kue)

“The 50 feet each side of the canal is marked as right of way with a land mark. And if they need land take it and we will grow crops after it” (A small farmer in Sint Kue)

“People know about right of way but they are growing crop as there is no enforcement. But it is fine when the canals renovated. Canal area map are already drawn up. It is the village tract administrator who has to organize.” (Small farmer in Pale Township)

7.2.5 Land Improvement Schemes

Villages in Sint Kue (Mandalay region), Pale (Sagaing) and Yaetar Shay (East Bago) are generally interesting the Land improvement scheme. However, villages in Tat Kone are not interested in the scheme as they have seen and heard more detailed practical issues on the land improvement schemes such as about quality and issues relating with redistribution of farmland (more detailed findings on the Land improvement schemes are also described in the Land Session). In addition, farmlands of some farmers in one of villages studied are included in the schemes implemented in their neighboring village and they have been experienced disappointment with the quality of the scheme. The following case was reported by one of the farmers experienced the unqualified implementation of the scheme.

Case: How farmers involved in a Land Improvement faced difficulty

One thousand acres land improvement scheme was conducted in one village tract in Tat Kone Township, Nay Pyi Taw Council in 2013 December. Around two hundred farmers from four villages have been involved in the scheme. Most of them are medium farmers owning 4-5 acres of land. Majority of farmers especially small farmers are faced with difficulties because of the technical weakness of the scheme.

Ko Kha Kway . who own one acre of “Le” land and two acres of “Ya” land is one of them. His one acre of “Le” land is included in land improvement scheme. Farmers have to skip one summer paddy for implementation of the scheme which took over five months. When they were returned their land in time for monsoon paddy, they have learned that scheme is not good enough to grow monsoon paddy. The land level differs three parts and embankments are also not high and strong enough. It seems farmers have to take their own responsibility to refine those gaps. Some farmers especially larger farmers reinforced embankments and leveled land paying 40,000 Kyat (10,000 Kyat for each side of

embankment) and 18,000 Kyat to agricultural mechanization department. But for small farmers like him cannot afford that money as they also missed summer paddy. In addition to the level of land and embankment defects, there are also failures in water course system as his land is higher than watercourse and water cannot be entered into his land. Finally, 50 farmers including him denied signing on the paper of acceptance of the scheme meaning the scheme is not good enough to accept.

Those being keenly interested in the scheme are large farmers and medium and small farmers have concerned on losing their land. Labour shortage is one of the significant factors for farmers to realize the land improvement scheme. Large farmers however, mentioned that they do not want to grow policy crops such as Pale Thwe after the development of the scheme as they have heard that farmers after land improvement schemes largely are encouraged strongly to grow Pale Thwe by Agricultural Departments.

The study found that two villages in Yaetarshay have signed agreement of implementation of land improvement schemes. In one village, all farmers signed the agreement while it is only 75% of farmers signed and the rest did not as the rest have concern of losing their land. It is reported that persons from township irrigation department, Agricultural mechanization department and Land record departments visited twice to those villages and talked about the land improvement schemes. Farmers gave their signatures after two times.

“One acre development scheme will be great. We can use big harvesters (which includes thrashing process). (A large Shan ethnic farmer in a village in Yaetar Shay)

“One acre development is good for farmers with large land holding but will not be fine for those with small holding” (Muslim medium farmers in Yaetar Shay)

“One acre development is not good for small land holding farmers like us. Our land could be lost”. (small farmers with less than 2 acres of the land in both Yaetar Shay and Tat Kone)

“As the land types are not equally distributed and those who have better land do not want the bad one. So, that seemed impossible”. (large farmers in Sint Kue)

“If government will implement, we want to do. We can give land but we don’t have money to contribute money”. (women headed medium farmers in Sint Kue)

7.2.6 People opinion on the farming technique

Every methods and seeds which will have high yield and market demands will be interested to use.

Farmers insisted that they are interested in testing new methods which are not financially costly and particular in activities. Some large farmers are willing to do demonstration or testing plot in their one acres of land. Small and medium farmers however expressed that they cannot take risk of testing new seeds or methods and that they will practice depending on the results of the large farmers. One important thing commonly expressed by farmers in all visited areas except Tat Kone is that they were encouraged to grow Pale Thwe and apply Rope Line method (GAP) by township agricultural departments. But they do not use as for several reasons. Pale Thwe is less market demand and have to

search for the buyers while other types are easily purchased by local brokers come to the village. The Rope Line methods for farmers and planting laborers have too much specification to practice.

Regarding with the learning technique, farmers largely prefer methods mixed with practical and theoretical. And they highlighted that they do not want learn looking at demonstration plot grown in other areas but the one grown on their village soil. Some farmers also recommended giving the methods of killing pesticides in times of pesticides killing their farmland. One more important thing regarding with using hybrid seeds is also commented by several farmers that water availability also determine seeds and thus they would not be using good and long tenure seeds which is not suitable for less water availability even though they wanted to.

7.2.7 Place for learning building

The point of view on arrangement of training places varied among people even in the same village. When we analyzed answers of various respondents, most of them proposed using existing community building such as “Dama Yone” (socio-religious places for Buddhists), monasteries and schools. But the people prefer the former two to schools as the former have more community ownership sense. Some respondents in three villages insisted that they could arrange space for building training schools in their community owned space. Some villagers in two villages recommend renting a space for training building. But no one give offer to donate their individual space or urged others to donate their space for the purpose.

7.2.8 Timing on giving training

Farmers commonly proposed that the after harvest time is the best time of the year. But after-harvest time varied for different farming types. The following table is shown different convenient months proposed by different regions. The best time of the day for the women is afternoon time around 1:30 to 3:00 pm when is the time most of the women farmers as well as labourers are tends to take rest at home because of the heat.

Table 35: The convenient months for giving trainings

Township	Convenient months for training
Yaetar Shay and Tat Kone	October, November
Sint Kue and Pale	January, February

Section 8: Positive Impacts and Potential Social Risks of the Project

More positive impacts than negative impacts are predicted regarding with the project on rehabilitation of the irrigation canals. Positive impacts include increase in income, development of community based

water management and need responsive service provision system will be developed. Positive social impacts could also be developed. Practices of social inclusion will gradually be developed because of the project.

There is risk on social cohesion of the community that is there is possibility of socioeconomic gaps between Ya farmers who have less possibility to include in the project and Le farmers who are the main targeted beneficiaries of the project. The project could create tangible and intangible gaps between Le and Ya farmers of the same community.

Regarding the farmer extension services, few negative impacts are seen. More importantly, farmer extension services could be the activities from which both Ya and Le farmers could be benefitted as farmer extension service providing new agricultural methods will not be limited only to paddy.

Several negative impacts could be seen regarding the land improvement projects. It is undeniable that land improvement schemes will result in more efficient production for farmers. Still, negative impacts seemed closer than positive impacts. People's high expectation and compromises in realities itself could create problems. One of them is hurting social relations in the village regarding redistribution of the land. Another possibility is unqualified implementation and subsequent tensions between implementers and the farmers. Last but important negative impact is possible land grabs especially in Mandalay and Tat Kone because of the land improvement schemes.

8.1 Positive Impacts of the projects

Increased income and saving extra costs for water: this is very possible sustainable positive impacts as is shown by the people in study villages with access to the irrigated water whose income increased because of increase in crop intensity as well as of growing paddy which is highly demanded in local and international markets. Those who are currently accessible to insufficient irrigated water and who need to spend extra cost or efforts to collect irrigation water could also save money and thus resulting in spending more money in production and social wellbeing.

Improving community based water management: The project will enhance community's capacity in water management and thus giving them more ownership sense which is vital for the sustainability of the infrastructures. More importantly, the community's capacity in dealing with service providers and asserting their needs regarding with the services will be enhanced by the project.

Better social relations will be developed: As the project will result in more equally distribution of water, tensions generated by competition on irrigated water will surely be settled out and thus resulting in more cohesive intra and inter-village relations.

Social inclusion will be enhanced: Given that the project promotes social inclusion people especially the formal and informal leaders of the community will be gradually instilled with the social inclusion mindset and thus will be leading to more socially inclusive societies giving care about the interests of minorities and the vulnerable.

8.2 Potential social risks

Possible acceleration of land sales: Better availability of irrigated water will increase the value of the land and it is possible that purchase of land by outsiders could happen particularly by business people and land speculators. Although this is highly unlikely because of the findings during the social assessment which learned that people rarely want to sell especially in the village with good water availability as they know well that land is their main resources of sustainable livelihoods, care should be exercised and farmers should be informed of the risk of land grab,

High economic and social gaps between beneficiaries and non-beneficiaries of irrigated water: most farmers who have only Ya land may not benefit from improved access to water. Since Ya farmers have been declining in socioeconomic conditions because of the frequent climatic variations since over 5 years ago. On the other hand, people benefiting irrigated water in the same village are experiencing ascending socioeconomic conditions. This will create social tensions between them particularly in those villages with significant portion of pure Ya farmers. In those villages where pure Ya land is not significant the social tension is not possible. However pure Ya farmers could become labourers of those who have Le lands.

So far the social tensions between the two groups of farmers in the same village have not been seen in villages with significant portion of Ya farmers. However, Ya farmers expressed their increasing needs for water because of more frequent climatic irregularities in recent years. If they have learned that they are left out for irrigated water, then they will be more unhappy and this is possible leading to social tensions.

Land improvements may trigger land sales to outsiders: Despite that better availability of irrigated water has limited possibility of purchase of land by outsiders it is very possible that land improvement schemes could encourage land purchase by business people especially in townships in Mandalay regions: Sint Kue and Tat Kone township which is more accessible to big agricultural markets. Land improvement schemes in fact are more attractive for business people because of the much better facilities to develop highly commercial modernized farming. Accordingly, the land prices will be increased much higher than those lands existed in villages with good water availability. For example, the lands with good water availability in Sagaing and Yaetar Shay are not more than 30 lakh per acre, the lands under land improvement schemes in Nay Pyi Taw are priced between 100 and 200 lakhs depending on the locations to the main roads. So, the possible negative impacts for local farmers of land improvement schemes are purchase of land by outsiders if the transactions are not performed in a fair and transparent manner.

Social relations in community could be compromised: The SA found likelihood of infliction to social relations in the community especially because of the land redistribution of the project. Land redistribution after implementation of the project required negotiations and compromising among farmers in the communities as each land will be given up and redistributed upon aggregate scales. As the lands currently are not measured precisely by land record department, this could become one of the conflicting points when lands are redistributed.

Risks on unfair distribution of land for very small farmers: The land improvement schemes are implemented based on calculation of aggregate scale of a certain areas of farming. As such, space given for product roads and canals are finally deducted proportionately. This is not a big deal for large and medium farmers. However, small farmers particularly those with less than 1 acres land holding sizes will be faced with significant problems without having sufficient land for efficient production. Very small land holders also have expressed concerns on this issue. So, the project requires finding means of fair distribution of costs and benefits for very small land holders.

Section 9: Recommendation

For the whole project

How the project could be the one managed by the community with the voices of the vulnerable are being heard and responded...

In order to be so, the role of Water User Groups and ACC are important. In order that Water User Groups are to be truly represented by all farmers as well as vulnerable ones, the leaders of the groups are to be elected by the farmers using water. The leaders of each water course are to be elected by farming using the same course and the head of the WUGs within one village should also be elected leaders of each water course or all farmers in the community. At this point the constitution regarding with the WUGs are to be developed. In the constitutions, membership of WUGs; elections of water users groups, the roles and responsibilities of members and leaders of WUGs; compensation for the leaders; the penalties for breaching the rules of the WUGs; resource pool and management; decision making; complaints mechanism (intra groups and regarding with the service providers); communication channels with service providers; information giving mechanisms and record keeping and so on are to be included. In order that the WUGs are to be truly representative of vulnerable farmers, membership; decision making and complaints mechanism are to be careful laid out for inclusion of vulnerable farmers.

In order that the project is to be operated by community based management, it is required that WUGs and ACC are to work in close coordination. The heads of WUGs are to meet with Sub-Accs regularly and put forward their needs and problems. Before the meeting, the heads of WUGs and the leaders of each WUG are to meet with all farmers in the village and have consultations on their problems and needs in order to be prepared for the regular meeting with ACC. In this way, the projects could be managed by farmers and their voices could be heard and responded.

How ACC should be workable/feasible for the project

ACC in fact is very fundamental for the success of the project and sustainability of the project. ACC will have to play a focal role bridging the service providers to the people. Accordingly, ACCs in all township across the county are to be transformed taking the ACC in Tat Kone Township as a model. The only thing to make sure is the participation of the heads of all leaders of WUGs in every village in regular meeting with sub-ACC held at the outpost offices so that the voices of the people are to be heard and responded.

Capacity Building and civic education targeted at both the people and the service providers are essential for the long term success of the project

In order that the project are to be inclusive and responsive, capacity building component is essential. The capacity building is to be targeted at both service providers and the people. For the service providers, such concept as social inclusion, gender and accountability are to be provided. On the other hand, the people (members of WUGs) are to be provided with civic education, education on Land Laws and Irrigation Laws, the concept of social inclusion, gender, leadership, record keeping and basic financial management and so on. For trainings especially for the community, it is strongly recommended to use simplified literatures. It is recommended taking similar model of education on Land Laws conducted by Food Security Working Groups and Norwegian People's Aid. In this model, the legal terms of the current Land Laws are simplified and described in a cute pictures and thus attracting the people to learn.

The SA found various disobediences of irrigation rules and regulations by community in acquiring irrigated water. They used different means in enhancing water availability and this is seen worse in villages with good water availability. So, this should be very important matter which needs to be highly considered in developing rules and regulations for WUGs and building capacity of water user groups by the project.

Site specific studied is required to learn more on area specific socio-economic and ethnic conditions: Site specific studies are to be taken when irrigation schemes are preliminarily selected for renovation in order to learn more detailed areal specific socio-economic, social and ethnic information.

Renovating Canals and water courses

Obtaining farmers' agreements to remove crops on the Right of Way will not be difficult, but a participatory process possibly facilitated by a civil society organization will be most effective

Many formal and informal community leaders told the research team that removal of crops grown in the Right of Way was not impossible because most farmers recognize that they are not allowed to grow crops in the right of way of canals, even though many did not know the boundaries of the right of way exactly. In addition, the majority of farmers maintained that they would remove their crop from the canal areas if they are to be repaired. What they only want to be assured is functionality of the canals, they said.

One important thing recommended by some VERPs is to do the work through organizing the people. This means despite that people are acknowledged about the canal areas, they are not to be removed by force but by soft ways explaining about the project and its results. This way however seemed easy but this organizational work should not be done by government departments alone but through the help of some civil society organization which are skillful in organizing the community through participatory methods. .

The scale of land loss for rehabilitation should be done equitably for the sake of vulnerable farmers. There will land loss when irrigation canals are rehabilitated by the project. This land loss should be managed more equitably for vulnerable farmers particularly for those with one and less than one acres of farmland.

Disobedience of the people on the irrigation rules and regulations are to be aware of of

Negative impacts of irrigation schemes on the non-irrigated areas are also to pay attention

The rehabilitation of irrigation schemes should also pay attention to the negative effects on the non-irrigable areas which suffered negative impacts of irrigated areas. So, the rehabilitation scheme should also manage not to have negative externalities of the rehabilitated irrigation schemes. It is highly recommended not to choose schemes with those negative impacts on the non-irrigable areas for the initial projects.

Extension Services

Theoretical and practical learning methods should be applied. More importantly, people's most suggested learning technique is learning while taking actions to the problems they are faced with in reality. For example: people want to learn how to handle a certain pest only when they are being faced with that pest problems in their farmland. In order to fulfill this need the service providers are to be efficient enough to be close in touch with the community.

Supporting for sufficient number of staffs and capacity to outreach: Relating to the above recommended point plus SA's finds insufficient number of staffs and budget as one of the key constraints for agricultural department for giving services effectively, it is recommended the project supporting not only technically but also financially for reinforcement of number of staffs and capacity for outreaching to community.

As SA found the gender based division of labor is much reduced, it is highly recommended providing women laborers with training on how to use farming machine more effectively including how to repair machines that will be more benefitting women labor who are replacing the needs for male laborers.

It is recommended learning on the types of seeds that farmers are using and preferring to use during site specific study so that the seeds department of MOAI could effectively support the types of seeds relevant to the preferences of farmers from different areas. SA learned that agricultural extension services currently giving training in some main tract village three times per year. **However, SA recommended timing of training should be consulted with the people.**

Farmers are to be given awareness that they should also grow cash crops rather than upholding only paddy so that their income will be generated throughout the year. It is recommended to grow such cash crops as onion, chili and other vegetables are to be grown when they get irrigated water whole year.

Land improvement schemes

Two significant issues in the land improvements are revealed during the assessments of land improvements implemented in Yae Aye village and Ah Lying Lo village near Nay Pyi Taw: (1) Redistribution of farmlands after implementation of the scheme; and (2) Shortfalls in quality of the scheme. Such findings are consistent with another case of land improvement studied in Tat Kone township (near Nay Pyi Taw)⁴⁰.

Issue 1 Redistribution of the land: It is very difficult to acquire the full consent of all farmers especially of those with very small land holding, that is, one acre and below. One basic source of the issue is the failure of making precise measurement of each farmer's land holding before the implementation or during the process of land entitlement. It is a good idea that the lands are proportionately acquired for spaces of product roads and water courses. However, the lack of precise measurement lies as a source for future dispute.

Issue 2: the short falls in quality of the scheme: It is reported by participants of Yae Aye land improvement scheme that works done are not good enough to grow crops and the farmers are to fill that gaps at their own financial costs. According to some of the persons from irrigation department, the scheme implemented by the government (mainly irrigation department) with the funding of JICA is the ideal in quality and technical facilities. The financial cost of JICA funded land improvement schemes is nearly 4 times higher than that of government schemes.

Accordingly SA recommends quality guarantee from the implementing department are especially required for the success of the schemes. This means quality guarantee laid out both with the participation of the people is required before the implementation. In addition, financial strength could also matter for the implementation of the scheme with guaranteed quality.

SA also highly recommends SLRD making precise measurement of land before implementing the land improvement schemes. In measuring the land farmers who will be participating in land improvement schemes are also to be accompanied with the technical and administrative land measuring teams from SLRD.

Requires to find ways of fair distribution of costs and benefits for small farmers who will be participated in land improvement schemes

The land improvement schemes are implemented based on calculation of aggregate scale of a certain areas of farming. As such, space given for product roads and canals are finally deducted proportionately. This is not a big deal for large and medium farmers. However, small famers particularly those with less than 1 acres land holding sizes will be faced with significant problems without having sufficient land for efficient production. Very small land holders also have expressed concerns on this issue. So, the project requires finding means of fair distribution of costs and benefits for very small land holders. The SA

⁴⁰ None of the villages are being implemented land improvement scheme. But some villagers in one of the villages studied in Tat Kone township (near NPT) are included in the schemes implemented in the neighboring village.

recommended giving exemption to small farmers with less than 1 acres from proportionate reduction of their land.

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Seasonal Calendar of farming activities in Pale Township

	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	
Moonsoon paddy								→						
summer paddy		→												
Maye Paddy									→					
sesame									→					
Greengram								→						

Annex 2: Photos on Land Improvement Schemes

Photos on Ah Lyin Lo Schemes



Photos in JICA schemes



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