Climate Smart Rice Project

Gender and Social Equity Analysis in Rice Production

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By: Min Myat Aung & May Thida Aung

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Executive Summary

The Gender and Society Equity (GSE) analysis in rice production was conducted in nine townships in three agroecological zones of Myanmar; Coastal zone (Mon State and Bago Region), Dry zone (Mandalay Region) and Uplands (Southern Shan State) where the Climate Smart Rice (CSR) project aims to introduce climate smart and resource efficient best practices to strengthen the rice value chain. While introducing these improved practices in rice production, assessing the potential impacts to men and women's workload is crucial. The study was conducted using the Participatory Action Research (PAR) approach comprising of activity mapping exercises, Focus Group Discussions (FGD) and Key Informant Interviews (KII) to assess the potential impacts of introducing improved practices and technologies on existing workload and economy among diverse ethnic communities especially for women. Both men and women rice farmers from diverse ethnic groups and age groups participated in the study. The PAR approach included identification of gender-based workloads, mapping activities, and identifying Gender Based Constraints (GBCs) in rice production. Gender specific workload and decision making in rice production was analyzed for 4 categories (adult men, young men, women and children) depending on local perception on workload distribution in rice farming activities such as land preparation, planting and tending, and harvest and post-harvest steps.

All the ethnic groups - *Mon, Karen, Taung Yoe, Shan, Inn Tha*r and *Burmese*, are dependent on agriculture where rice contributed 46 to 78% of their monthly income. All the ethnic groups practiced rain-fed rice production during monsoon season while some Burmese grew irrigated rice during the summer rice only in areas where irrigation facility were available. Upland rice was cultivated by Taung Yoe community. With diverse traditions, agro-ecological and agro-geographic conditions, the study observed different farming practices and gender-based workload distribution in different ethnic community. Family labor was found as the primary workforce, but additional labor from the community were hired when required.

In general, men dominated most of the tasks in rice production. Women played a significant role being solely responsible for some critical steps such as manual transplanting and supporting most of the men-dominated tasks. The workload distribution among adult and young men groups varied with available workforce in the community and practice and technology used in rice cultivation. Children also helped as family labor for the family rice production.

Women are specifically responsible for traditional manual methods of transplanting, gap filling, weeding, harvesting, and storing grains which ranged from 28-90% of the workload. In other steps of rice production requiring heavier manual work, women's role was less visible, due to structural barriers such as operation of heavy machines, carry heavy loads of seed bags and cultural barriers of assigning lighter tasks to women and their main responsibility to take care of the housework.

Notably, income is important for women not only to supplement the family living but also for their dignity, self-esteem and self-development. The study revealed that rice cultivation is the main source of income of Mon women as there are limited other opportunities in and around their village. The increasing use of farm machinery mainly for planting and harvesting activities has reduced the chances of women's involvement as wage laborer and consequently their income. However, changes in farming practices with increased farm

mechanization has created opportunities for young men workforce in operation of these farm machineries. While there are still potential spaces for women's involvement in the field, the concern is securing equal wages for equal workload. Farmers prefer manual weeding because of its effectiveness during young seedling stage. If line seeding and alternate wetting and drying (AWD) methods are widely introduced and adopted, women will have increased workload while also increased opportunities to provide labor for manual weeding. The study concludes that the introduction of the sustainable best practices and improved technologies need to be carefully implemented so as not to increase existing workload for women but to create opportunities in securing their livelihoods and income.

The study therefore recommends possible interventions on improving gender and social equity. The first way is to create alternative income generating opportunities for women by adapting to existing situations. These are to expand and share workload in traditional manual works for income opportunities by removing structural barriers, to secure spaces for women on works resulted from adoption of sustainable best practices, to use women-friendly agricultural tools and to secure women participation in using farm machinery and vocational and life-skill training. The second method is to reduce women workload by encouraging the use of timesaving and efficient household appliances, establishing community care centers for children and elders and changing the perception of seeing women as the only primary caretaker of the households.

The study further recommends following to enhance the role and capacity of women to involve in the rice value chain:

1. To prioritize and provide trainings on operation of farm machineries and vocational skills for women in all the project target area that rely heavily on rice cultivation e.g. in Mon State,
2. To use right-based approach in designing and adopting short-term and long-term plans for gender equity through public consultation by ensuring women participation,
3. To do analyze and identify suitable and sustainable income generating job opportunities including markets for the targeted areas especially in Mon State,
4. To cooperate with other stakeholders for the capacity building and vocational trainings,
5. To make sure project and its partners well-understand the important of gender equity so that the participation of women equally with men in all the knowledge sharing event can be ensured, and
6. To advocate the relevant government institutions and farm machine importers or local producers, if any, to consider gender perspective in the policy and importation or production of women-friendly agricultural tools and farm machineries.

Acronyms

ADB	Asian Development Bank
ASEAN	Association of South East Asian Nations
AWD	Alternate Wetting and Drying
CSR	Climate Smart Rice Project
FAO	Food and Agriculture Organization
FGD	Focus Group Discussions
GBC	Gender-based Constraints
GDP	Gross Domestic Production
GSE	Gender and Social Equity
KII	Key Informant Interview
MMK	Myanmar Kyat
NORAD	Norwegian Agency for Development Cooperation
PAR	Participatory Action Research
REP	Resource Efficient Practices
SBP	Sustainable Best Practices
SDC	Swiss Agency for Development Cooperation
SRP	Sustainable Rice Platform
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
WAPRO	Water Productivity Project

1. Background and Justification

Agriculture is the major economic component of Myanmar that provides both incomes and job opportunities for rural households. The agriculture sector provides 85% of employments in Myanmar and contribute to 37% of the national GDP.[1] The rural farmers nowadays are facing a serious impacts of climate change and environmental degradation. Consequently, their agricultural incomes are reduced due to production losses thereby increasing the insecurity of food supply. The farming activities in rural areas are generally performed by family labor including women while applying locally available agricultural inputs.[2]

The limited resources and poor capacity to response to current climate variability and environmental degradation can impose smallholder farmers more vulnerable not only in current situation but also in future. The underlying causes are rooted from socio-economic and policy constraints, for instances, low education, insufficient income, small size landholding size, limited accessibility to advanced technology, financial and capacity supports.[3]

Rice is the staple crop across tropical Asian countries supporting basic food and source of income for both families and the nation. Even though growing various crop varieties with particular cultivation practices in different agroecological zones, rice is resources-demanded crop and involves various actors through each steps of its value chain. Rising temperature and accelerated climate change impacts compounding with environmental degradation worsen scarcity of natural resources, e.g., water supply for both domestic and agricultural application. Therefore, the urgent requirement is effective and efficient utilization of water resources by implying in term of technology and capacity building in the rice business sector.

The Climate Smart Rice Project (CSR) is a 3 years initiative aimed at supporting the Government of Myanmar, the agri-business sector and smallholder rice farmers to stimulate transformation of the rice sector towards sustainability. Focusing on rice-inclusive farming systems, the project will prioritize enhancement of the livelihoods of smallholders through private sector development and partnerships promoting climate smart and resource-efficient best practices. The project is funded by the Norwegian Agency for Development Cooperation (NORAD) and the Swiss Agency for Development Cooperation (SDC) and implemented by a consortium of partners including UN Environment (UNEP), the Sustainable Rice Platform (SRP), HELVETAS Myanmar and PRIME Agri Group.

The project is implemented in 3 diverse locations: Mandalay, Southern Shan and Mon/Bago regions. One of the project outcomes is aiming to understand the importance and possible implications of introducing improved practices in rice production on the workload and economy of targeted smallholder famers, in particular women.

Women are practically involved in rice value chain. Women in ASEAN region, for instance, contributed 54, 92, 65 and 50% of tasks in rice cultivation in Lao PDR, Vietnam, Cambodia and Thailand respectively in terms of transplanting, weeding, threshing and harvesting.

[1] MoALI, 2015. Myanmar Climate-smart Agriculture Strategy.
[2] Nagayets, O., 2005. Small farms: Current status and key trends.
[3] Harvey, C. A. et al., 2014. Extreme vulnerability of smallholder farmers to agricultural risks and climate change in Madagascar.

However, they are underscored or sometime overlooked as an important actor due to social and cultural norms in a particular community. They are untitled mostly as unpaid workers and receive less than men's wages while burdening domestic workload of their families.

The situation is similar in Myanmar. According to a number of gender equality reports done by ADB,[4] UNDP[5] and USAID[6] mentioned that patriarchal cultural values related to women's roles and responsibilities still influence family relationships and contribute to division of labor and participation in the decision making. Women bear the responsibility for domestic works in addition to their paid jobs, while men are typically household heads. There is a gender-based division in crop cultivation, although it may differ according to cropping patterns by state or region. Women perform most of the tasks related to crop cultivation, of which most are crucial in production however classifying as soft tasks comparing to men's traditional energetic tasks. In addition, women bear the major responsibility for domestic and care work, such as gathering firewood and fuel, fetching drinking water, preparing meals, and caring for children and elderly. Men are perceived as the primary breadwinners, heads of household and sole decision makers, while women are responsible for maintaining the household.[7]Having commitments to a number of international frameworks such as Beijing Declaration and Platform for Action in 1995, CEDAW in 1997, ICESCR in 2015, Myanmar has legal and policy frameworks such as the 2008 Constitution and National Strategic Plan for Advancement of Women (NSPAW) to literally guarantee and promote the equal rights between men and women. Nonetheless, the chances for women to practically achieve equal rights with men have been limited by cultural and religious norms. According to the Gender Inequality Index (GII) which reflects gender-based inequalities in three dimensions- reproductive health, empowerment, and economic activity confirmed that as Myanmar was ranked as 106 out of 162 countries in 2018.[8] Aggregate data used by UNDP reflected that women constituted significant portion of the agricultural population, at 51 % in 2010. Of the total 5.4 million households with agricultural holdings in 2010, 816,000 or 15.1 % were headed by females, and 4 million or 84.9 % were headed by males.[9] Based on FAO's suggestion, promoting women's accessibility to agricultural resources as men's access can denote that the global food insecurity can reduce 12 to 17% and can further promote global agricultural productivity 20 to 30%. This can also increase the household income and the country income significantly.

Therefore, while agriculture sector is being introduced with resource efficient and effective techniques and practices for sustainable production, the existing limited spaces for women become impaired as their contribution and role in rice value chain are always overlooked in formulating and practicing relevant policies for rice industry. If missing to figure out women's tasks and workload in the value chain process, the rice business would result gender-based discrimination. This situation further creates women more vulnerable by limiting them to

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[4] ADB, August 2018, Detailed gender analysis, Myanmar: Climate-Friendly Agribusiness Value Chains Sector Project
[5] UNDP, 2016, Gender Equality and Women's Rights in Myanmar: A situation analysis
[6] USAID/Fertilizer Sector Improvement Project Gender Assessment, March 2015
[7] USAID, ibid, pp-4-5
[8] Human Development Report 2019, Inequalities in Human Development in the 21st Century, Briefing not for countries on the 2019 Human Development Report, p.6, http://hdr.undp.org/sites/all/themes/hdr_theme/country-notes/MMR.pdf
[9] UNDP, 2016, Gender Equality and Women's Rights in Myanmar: A situation analysis, p.47

participate in rice production and in addition, undermining the whole picture of rice value chain. In order to operate sustainable rice production, it is therefore urgency to access not only the current tasks and workloads contributed by women but also constraints introduced by improved practices and their possible solutions in rice value chain.

2. Objectives

The objectives of the Gender and Social Equity (GSE) assessment in rice production is to understand the possible implications of changes in technologies and practices on the workload and economy, especially for women, in project target areas. The specific objectives are:

a. To get a basic understanding of tasks division (who does) and decision making (who decides) in rice production and marketing by different social groups in the project target areas.
b. To analyze the workload especially for women in rice production and sources of labor e.g. migratory labor, child labor etc. in rice production.
c. To understand various types of gender related exploitations being observed at various levels of rice value chain and recommendations on measures that could be taken for its mitigation.
d. To conduct a comparative analysis of existing technologies and practices with improved resource-efficient technologies the project plans to introduce (to comply with SRP Standard) and its implication on labor requirement (workload) and economics (investments and profitability).
e. To recommend specific interventions for the project that will lead to increase integration of gender and social equity issues

3. Study Methodology

3.1 Methodological framework

The study was conducted with a Participatory Action Research (PAR) approach. PAR comprises of a series of participatory approaches under action-oriented research[10]. The research approach is the process of researchers and local participants working together in observing, analyzing and solving local issues and then formulating actions to implement for their livelihood improvement[11]. PAR approach covers a wide range of methods among them the commonly applied are interviewing, mapping, diagramming, group work and discussions[12]. In this study, Focus Group Discussions (FGD) was implied in which researchers and local farmers worked together in mapping localized production steps for rice production, defining gender workload and activity in each step and identification of Gender-

[10] Kindon, S., Pain R. and Kesby, M. 2007. Participatory Action Research Approaches and Methods: Connecting People, Participation and Place. London: Routledge.
[11] Valencia-Sandoval, D., Flanders, D. and Kozak, R. (2009). Participatory Landscape Planning and Sustainable Community Development: Methodological Observations from a Case Study in Rural Mexico. Landscape and Urban Planning 94.
[12] McIntyre A., 2007, Participatory Action Research.

based Constraints (GBCs). The participants of the FGDs included both men and women rice farmers selected from different ethnic groups and working age who are involved in the rice value chain through rice cultivation. A half-day session of FGD and mapping exercises were carried out with selected group of farmers in each study areas. This mapping exercise was done following the methodology recommended by FAO in studying and integrating the gender dimensions in the agricultural value chains[13]. Under the research method entwined the study objectives, the participants were invited in the process of identifying gender-based tasks and workloads, constraints and the underlying causes, the impacts of introduced best practices on gender and the potential measures for both women and young groups by stimulating their experiences and knowledge for each steps of rice production in each project village. The general socioeconomic information about farmer households were deepened by household questionnaires while conducting FGD, and further disaggregated into sex and ethnic communities. Key Informant Interview (KII) was carried out with local and project experts to explore more about the improved techniques and practices introduced by the project and to validate the results of mapping exercises and FGD. The overview of methodological framework is described in Figure 1.

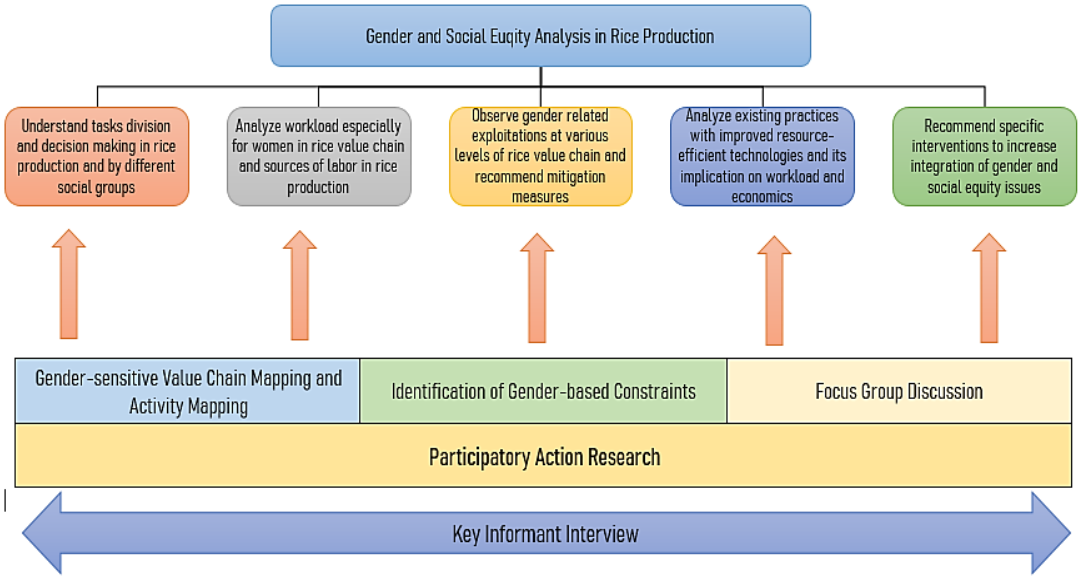


Figure 1 Research Framework

3.2 Study site selection

The study was conducted in nine Townships covering three agroecological zones of Myanmar where the Climate Smart Rice project aims to introduce resource efficient rice cultivation practices and to strengthen the sustainability of rice value chain as in **Error! Reference source not found.**.

Table 1 Overview of the project target areas

Coastal zone	**Mon State**	Kyeikmaraw, Paung, Thaton and Bilin townships

[13] FAO. 2018.Developing gender-sensitive value chains - Guidelines for practitioners. Rome

	Bago Region	Kawa township
Dry zone	Mandalay Region	Kyaukse township
Hilly zone	Southern Shan State	Kalaw, Nyaung Shwe and Lawksawk township

The comparative overview of ethnic proportion, agricultural land and workforce of these townships are described in Table 2[14]: The major ethnic community in each of the township was selected for the study.

Table 2 Socioeconomic overview of study townships

Townships	**Agriculture land (% of total land use)[15]**	**Agriculture labor (% of total labor)[16]**	**Major ethnic communities**
Kyeikmaraw	44.15	12.55	**Mon**, Burmese
Paung	55.13	8.23	Mon, **Burmese**
Thaton	55.02	8.82	**Karen**, Burmese, PaOh
Bilin	43.42	40.94	Karen, **Burmese**
Kawa	50.81	27.55	**Burmese**
Kyaukse	23.64	42.12	**Burmese**
Kalaw	20.74	44.28	DaNu, Burmese, PaOh, **Taung Yoe**
Nyaung Shwe	13.16	22.48	**InnThar,** PaOh
Lawksawk	8.91	40.46	Burmese, Danu, **Shan**

3.3 Sampling design

Study villages were purposively selected for each township where rice production (either monsoon or summer rice) is major livelihood activity and the resources efficient practices (REPs) were introduced by the project. The purposive sampling was applied for selecting participants representing the major ethnic group in the village. The participants were divided into 2 groups based on gender: Men farmer and Women farmer. Each group composed with average 5-7 participants of young persons (under age 18) and working age person (over age 18) depending on local availability. They were randomly selected based on ethnicity involving in rice production familiar with the improved practices. Even though most of townships in Myanmar are diverse with various ethnicities, selecting the ethnicity to be studied for each township depends on the common ethnic group and local availability due to peak working season of rice farming while discussing with the project teams. Table 3 and Figure 2 express the ethnic structure and locality of study village with number of participants.

[14] General Administration Department, 2018. These information are extracted from township socioeconomic reports available at http://www.gad.gov.mm/my.
[15] ibid
[16] ibid

Table 3 Ethnic composition of study villages

State/Region	Village/Township	Ethnics		Men	Women
Mon State	Let Pan village, Kyeikmaraw	Mon	Mapping exercise & FGD	9	2
	Phyu Ba village, Paung	Burmese	Mapping exercise & FGD	4	5
	Seik Kyun village, Thaton	Karen	Mapping exercise & FGD	8	6
	Kan Thar Yar village, Bilin	Burmese	Mapping exercise & FGD	10	4
Bago Region	Kyar Taw village, Kawa	Burmese	Mapping exercise & FGD	11	7
Mandalay Region	Kone Gyi village, Kyaukse	Burmese	Mapping exercise & FGD	5	9
Shan State	Myat Set village, Kalaw	Taung Yoe	Mapping exercise & FGD	7	5
	Tha Pyay Pin village, Nyaung Shwe	Inn Thar	Mapping exercise & FGD	6	7
	Yaung Chi Oo village, Lawksawk	Shan	Mapping exercise & FGD	3	3
Total				63	48

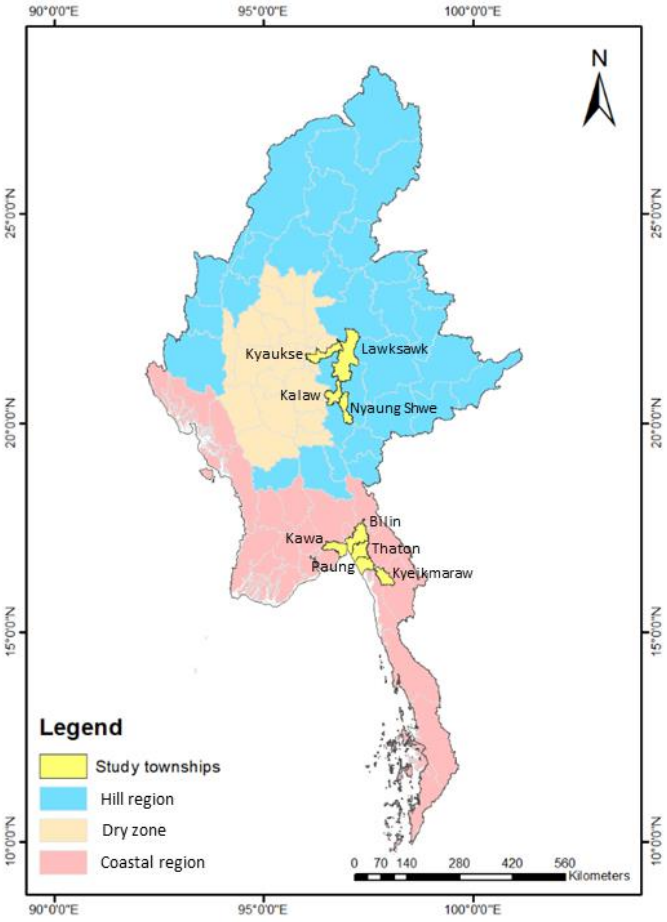


Figure 2 Location of study areas

The key informants were selected purposively as one interviewee for each village. They were selected as farmers (either men or women) having well experiences on rice cultivation or project staffs and partners working at community level in each village. The total number of 9 persons were interviewed with semi-structured questions through face to face or email. However, 8 out of 9 interviewees were involved in KII process.

3.3.1 Participatory Action Research (PAR)

The PAR process was organized first with mapping exercise in which all participants were questioned to map sex-disaggregated labor division and workload and decision makers, and determine current constraints, their knowledge on Sustainable Best Practices (SBPs) and current implementation. FGD was followed in parallel among men and women farmer groups to capture their perceptions on women and men culturally organized work division, gender related exploitation and limitation, possible solutions for livelihood improvement. The mapping exercise was involved 3 steps: gender workload mapping in rice production, Matrix for Activity Mapping and identification of Gender-based Constraints (GBCs). The mapping exercises was initiated by the participants by applying mind mapping to draw all steps covering rice value chain (from preparation to storage) at first. Then, the activity mapping identified the detailed tasks and workloads for each step (Who does and Who decides). After the activity mapping, the GBCs, i.e., the barriers and difficulties particularly women experienced, were immediately identified in each step together with the underlying causes. Finally, the potential means for favoring women and young people were described to be more beneficial from improved practices in rice value chain.

The general socioeconomic data of households was collected by questionnaires for their income generation and sources, education and health status, jobs, rice farming context, migratory and housing conditions. The semi-structured questions were applied for both mapping exercise and FGD as in the Annex I and the summary of collected data of FGD is attached in the Annex II.

3.3.2 Key Informant Interview (KII)

The KII was conducted to configure more about current gender-based tasks, importance of women's role and contribution in rice value chain, potential impacts of improved rice farming practices on gender balance and the possible remedial measures. The other aspect of doing KII is validating the results from mapping exercise and FGD processes. KII was conducted with 8 participants via face to face or email depending upon their available and favorable connection.

Ethical considerations were strictly taken into account. All the participants were verbally well-informed about the purposes of the interview and the processes of taking notes and recording. Verbal consent was taken before starting the interview conversation in each study village.

3.4 Data analysis

After each PAR, FGD and KII, the principal investigator and research assistants reviewed and summarized the discussion. All the conversation during PAR, FGD and KII were audio recorded and the English translations were subsequently transcribed. Once the data files were cleaned and put into a common format, the analysis commenced with a close reading of

the text. The collected data was mapped in both qualitative and quantitative methods, and analyzed, interpreted, and presented based on ethnicity, gender and working age groups with descriptive and analytical means.

4. Findings

4.1 Socioeconomic context of project target areas

The socioeconomic status of farmers among the project target villages where the study was carried out is diverse based on the ethnicity, agro-geographic and sociocultural situations. Though the study covered three agroecological zones of Myanmar, five out of total nine study sites are in coastal zone with Mon, Burmese and Karen ethnic communities. Three study sites were in hilly uplands with Shan, Taung Yoe, Inn Thar and Pa Oh ethnics. Only one site is dry zone with Burmese ethnic community.

The average family size ranges from 4.4 to 6.4 persons a little more than national standard of 4.4 but mostly in line with specific regional size[17]. All study household's livelihoods were based on agriculture with diverse crops, some relying only on rice while some depending on other seasonal crops.

4.1.1 Incomes and Household assets

Average monthly income of study area is given in Table 4.

Table 4 Average monthly income

Ethnics	Township	Average monthly income (MMK)	Average landholding size (acres)
Mon	Kyeikmaraw	295,455	4.2
Burmese	Paung	338,889	7
Karen	Thaton	539,285	19.3
Burmese	Bilin	629,714	11.75
Burmese	Kawa	830,556	15
Burmese	Kyaukse	496,429	4.6
Taung Yoe	Kalaw	375,000	4.4
Inn Thar	Nyaung Shwe	396,153	3.4
Shan	Lawksawk	358,333	7

However, income gap was very wide between the highest of 2 million Kyat and the lowest fifty thousand Kyats as defined by diversification in farm property, livelihoods, crops, and lastly remittance. However, this income also cover expenditure for both family and farm inputs so that it is hard to define the wealth clearly and precisely but can be sufficiency as family and farm size are in turn the determining factors.

[17] Average family size is in 4.2 and 4.4 in Bago and Mandalay Region, 4.6 and 4.7 in Mon and Shan State respectively.

The availability of arable land, population density and geographic features shaped average farmland size in rice production across study villages from the smallest 3.6 acres to the highest of 19.3 acres. Lowland region generally possesses farmland bigger than upland areas. In Kyaukse with lowland areas, the population density would be considerable for being small farm size. However, farmland size could not alone describe the income in aspect of cultivation as many other determinants are governing in term of cropping intensity, variety, crop yield and market prices in direct manner meanwhile indirectly affected by climate change and natural disaster as well as pest and disease outbreak. The overview of farmland size and monthly incomes among study communities are described in Figure 3.

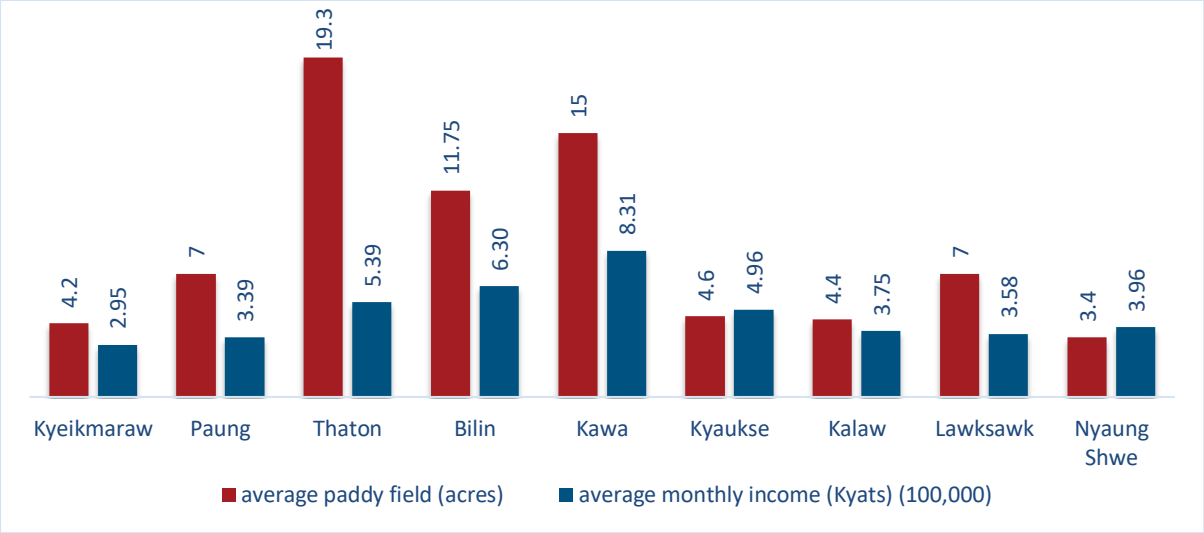


Figure 3 Average farm size and monthly income

The most common housing types where the respondents are residing are wooden, concrete, and mixed (wood and brick) types. However, some people live in bamboo huts with thatch roofing. Mon people commonly built their house with wood, brick and concrete. Burmese people across various agro-geological areas use woods, brick and concrete in majority and smaller portion use bamboo and thatched roof for their houses. Karen people use similar construction materials. Taung Yoe, Shan, PaOh and Inn Thar community in the uplands commonly use wood and brick for housing as. The exception is bamboo huts as small portion in Inn Thar.

In terms of equipment for basic amenities such as information, communication and transportation, all ethnics have wider use of televisions, mobile phones and motorbikes where some have bicycles and boats for their travel. Radios are stilled applicable for weather information under the shortage of electricity but half usage in comparable to modern basic amenities. These proportions in both amenity and transportation are very much higher than national standard on household property in accordance with 2014 National Census findings[18]. The farming materials vary widely not only among ethnic communities but also among geoclimatic conditions. Within same coastal areas, Mon farmers have more farm animals than farm machinery while Karen farmers are possessing in opposite. Burmese farmers own

[18] In rural area, the average property availability on communication amenities is 38.8% in radio, 39.2% in television and 21% in mobile phone, and transportation equipment is 37.7% in motorbike and 31.7% in bicycle (2014 National Census).

more farm machinery than farm animals in Paung township while opposite in Kyaukse and equal proportion in Kawa township. None of farm animals are belonging to both Inn Thar and Shan farmers in upland region but relying their cultivation on farm machinery alone. Three quarter of Taung Yoe farmers possessed farm animals and machinery in equal.

4.1.2 Access to Electricity

All the study villages have access to electricity from the national grid. Over 80% of the local residences get access to electricity are Mon, Karen and Burmese farmers in coastal areas and dry zone. All farmers' upland dwellings where living Taung Yoe, Inn Thar, Shan and Pa Oh are completely equipped electricity with government facility. Access to electricity in study villages is higher than national standard of rural access to electricity as in 2014[19]. Among the study villages, Kan Thar Yar village in Bilin township where local inhabitants are mostly Burmese has limited access to government electricity supply (43% electrification) while the source for electrification mainly depends on private solar system (50%). Some people are still out of any source of electricity who are Burmese farmers living in Bilin and Kyaukse township. The underlying cause could be unaffordable issue. The interesting observed case is community electrification system implemented among Mon residences in Kyeikmaraw township where some residences (12%) are electrified with that community system.

4.1.3 Access to Water supply

Full access to water supply is received among households in all study villages. However, the availability for domestic water usage is diverse from private to communal sources across locations. Water availability is commonly related to geographic features where residences in some villages relying water supply on communal sources such as pond and lake through community distribution system in Kawa and through hand-carrying as in Kyeikmaraw, Paung, Bilin and Kyaukse. Upland community distribution system utilizes spring and creek for domestic water supply for residences.

4.1.4 Education

Although the level of education differs among gender, geographic locations and ethnics groups, women have less access to education than men. Eight out of the nine study villages have women never attending formal or non-formal school. Formal education means school managed by government and non-formal is managed as charity by local societies especially religious entities but recognized by government. Meanwhile, three villages have men farmers never attending the school. Every society in the past favored men more access to education than women across the study areas. However, majority of both men and women completed primary or non-formal education, moderately secondary school, and a very few attended high school and University.

In term of school leavers, Kyar Taw village is the only village without children being dropped out school among study villages. Sex ratio among school leaving children differed and the causes here is issues related to financial, social and physical constraints regardless of gender. Financial constraints particularly defined incapability of parents in providing educational expenses to their children and then adolescents are forced to work in farm or

[19] Rural source of lighting is 14.9% government electricity and 11.5% solar system as noted in 2014 National Census.

business around for household income generation. Physical constraints are diverse as school distance far away from home and absence of the required classes in the native school. The social cause of school leaving is children themselves no more interest to study and some working of their own accord in supporting family income.

4.1.5 Access to Health care

People from study villages receive health services from rural health care centers and nearby hospitals depending on the interest of clients and severity of sufferings. Gender related health issues arising from rice cultivation are back, waist and joint pains, body ache, seasonal flu, tiredness and minor occupational accident suffered by women as mainly involving in transplanting, harvesting and weeding. Women suffering these health conditions takes self-medications and only goes for treatment when the conditions are worse.

4.1.6 Migration

Migration is popular primarily among young people due to scarcity of job opportunities locally and the want for higher income leading to a better life. Young people regardless of sex from all study villages except in Kalaw township have moved outside their community as internal and external migration as it is found as the national trend[20]. However, the locality and accessibility are considered as one additional determining factor in favoring migration. It was found that almost all young workforce from Mon and Burmese community and some portion of Karen community in Mon State goes as migrant workers to Thailand which is very close and accessible from their villages. Similar situation is in Shan and Inn Thar communities who migrates to China[21] or internally to the nearest cities where tourism is flourishing. The decision to migration can hardly be said as influenced by ethnics, however, interestingly, in Taung Yoe ethnic community, less young people migrates but work more in the local farms together with their family. The main reason noted in the FGD is the society with a stronger family bond. Remittances from the migrant workers is a main contributor to family income as secondary source of livelihood upon which some family solely depend for their survival and investments for farm inputs.

4.1.7 Household livelihoods

All communities in the study areas are dependent on agriculture, contributing to both the primary and secondary sources of livelihoods. Rice is cultivated as subsistence crop by majority of the households and only excess is sold. Rice production is the major source of income across the study villages except in Kyaukse and Kalaw townships where cash crops are the major source of income. Other noted sources of household income is remittance by the people working outside. The primary source of income contributes to 46 to 78% of the total household income and income from rice contributes to 69 to 74%. There are different sources of secondary income such as cash crop production, livestock raising, grocery, daily wage labor, remittance, trading, carpenter, mechanics and domestic business including clothes weaving and soap production. The overview of primary and secondary livelihood activities observed among farmers is presented in the Table 5. All family members have engaged in both primary and secondary livelihood activities while men always engaging in

[20] One of main reasons for migration is employment as second determining factor (34.3%) noted in 2014 National Census

[21] This finding is re-enforced that most of migrants are from Mon State followed by Shan State living the most in Thailand (70.2%) as mentioned in 2014 National Census

heavy works outside and women always in light works outside and domestic works in parallel with carrying out housekeeping tasks. Adults and young are often major income contributors, but some children contribute as helper in family businesses.

Table 5 Primary and secondary livelihood activities and contribution to monthly income

Ethnic community	Townships	Primary livelihood	% of monthly income	Secondary livelihood	% of monthly income
Mon	Kyeikmaraw	Rice production (91%) Remittance (9%)	46	Seasonal crop, livestock breeding and remittance	44
Burmese	Paung	Rice production	74	Livestock breeding and grocery	26
Karen	Thaton	Rice production (93%) Seasonal crop and remittance (7%)	78	Remittance, grocery, orchard, and livestock breeding	22
Burmese	Bilin	Rice production (93%) Remittance (7%)	76	Livestock breeding, remittance, and seasonal crop	24
Burmese	Kawa	Rice production	69	Seasonal crop, livestock breeding and remittance	31
Burmese	Kyaukse	Seasonal crop (64%) Rice production (36%)	66	Rice production, seasonal crop, livestock breeding and daily waged labor	34
Taung Yoe	Kalaw	Seasonal crop (83%) Rice production (17%)	68	Rice production, seasonal crop, daily waged labor, and grocery	32
Shan	Lawksawk	Rice production (67%) Seasonal crop (33%)	72	Rice production, seasonal crop, carpenter, and grocery	28
Inn Thar	Nyaung Shwe	Rice production (85%) Seasonal crop (15%)	65	Seasonal crop, orchard, livestock breeding, trading, mechanic, and domestic business	35

4.2 Gender workload distribution in rice production

This study categorizes rice cultivation practices into three steps:

1. **preparation step** - which includes nursery preparation, land preparation and irrigation if required
2. **planting and tending step** - transplanting, gap filling, weed control (manual or chemical), fertilizer application, irrigation, pest, rodent and snail control

3. **harvest and post-harvest step** - harvesting, threshing, and winnowing (manual or machines), drying, transportation and storage.

Farming practices in each of these steps are different among communities in accordance with their tradition and agro-ecological situations.

The study further defined gender workload into four groups as per the age: Adult men (age over 30 years), Women, Young men (aged between 18 - 30 years) and Children (both boy and girl younger than 18 years). Men were divided into two groups, i.e., Adult men (age over 30 years) and Young men (aged between 18 - 30 years) based on the participants' perception on contribution of gender workload during mapping exercise and FGD. The assumption is that there were clear workload division between elder men and young men however all women regardless of age classes were involved in the same tasks and similar situation was found in children (no clear division between boys and girls). Thus, women are classified into one group regardless of their age, and finally children group into one group who are either boy or girl younger than 18 years old.

All farmers primarily used family labor in growing rice with additional labor hired from the community when required. In general, there is a perception that men dominate rice farming, however there are some critical steps and activities mainly done by women who play a significant role. From the workload assessment, it was observed that the tasks dominantly done by men could not be finished without the help of women. Women have never been recognized as key contributors in rice production process across all communities except their outstanding jobs such as transplanting and somewhere manual harvesting. The reason noted in FGD is their efforts are always being overlooked in every activity as one example is fertilizer application which is mostly done by men but, women helps to carry fertilizer containers so that men can operate rapidly.

Two types of rice cultivation were observed - lowland rice and upland rice. In case of lowland rice, monsoon rice was cultivated by all communities but summer (irrigated) rice was grown only by some communities. The detailed farming activities among cropping types and communities are describe in Annex I. The workload distribution in different steps of rice cultivation in different types of rice production system is shown in Figure 4.

In all the communities, transplanting, weeding, harvesting and winnowing are recognized as the tasks done mostly by the women. The workload distribution for men is very different among different age groups across different communities depending on availability of younger age group in the community, community workforce structure and technology used in rice production.

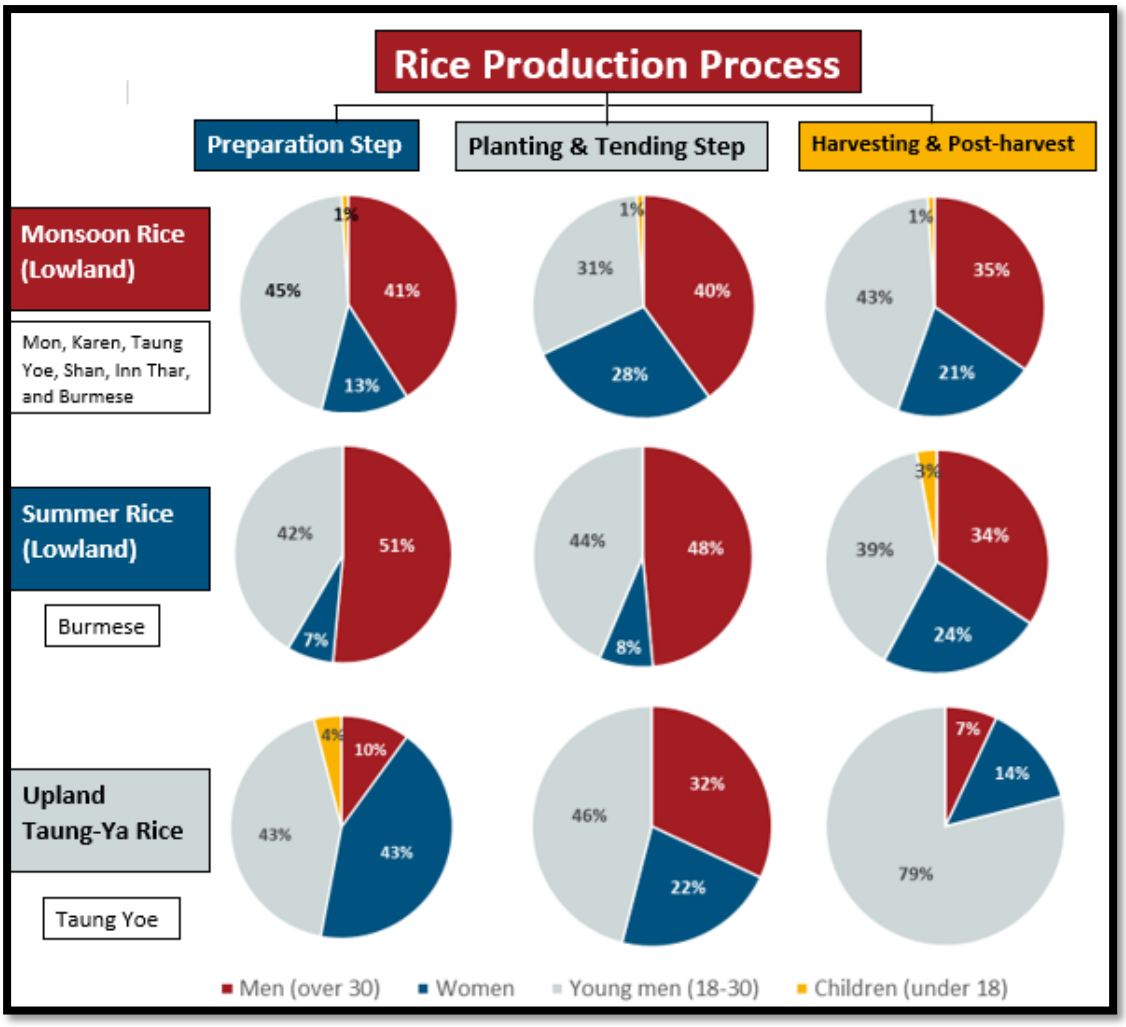


Figure 4 Overview of rice production and gender workload among study communities

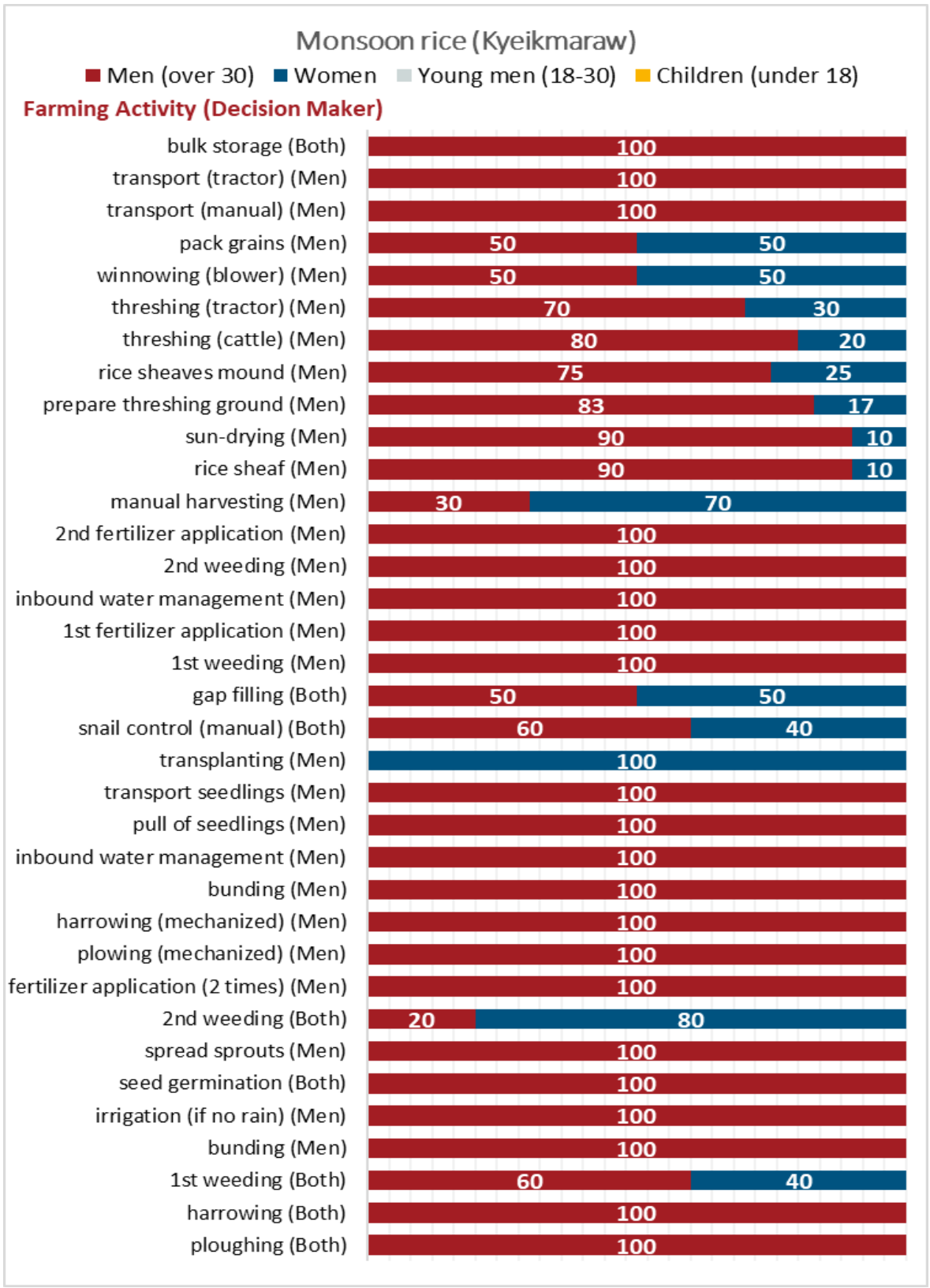
4.2.1 Lowland rice

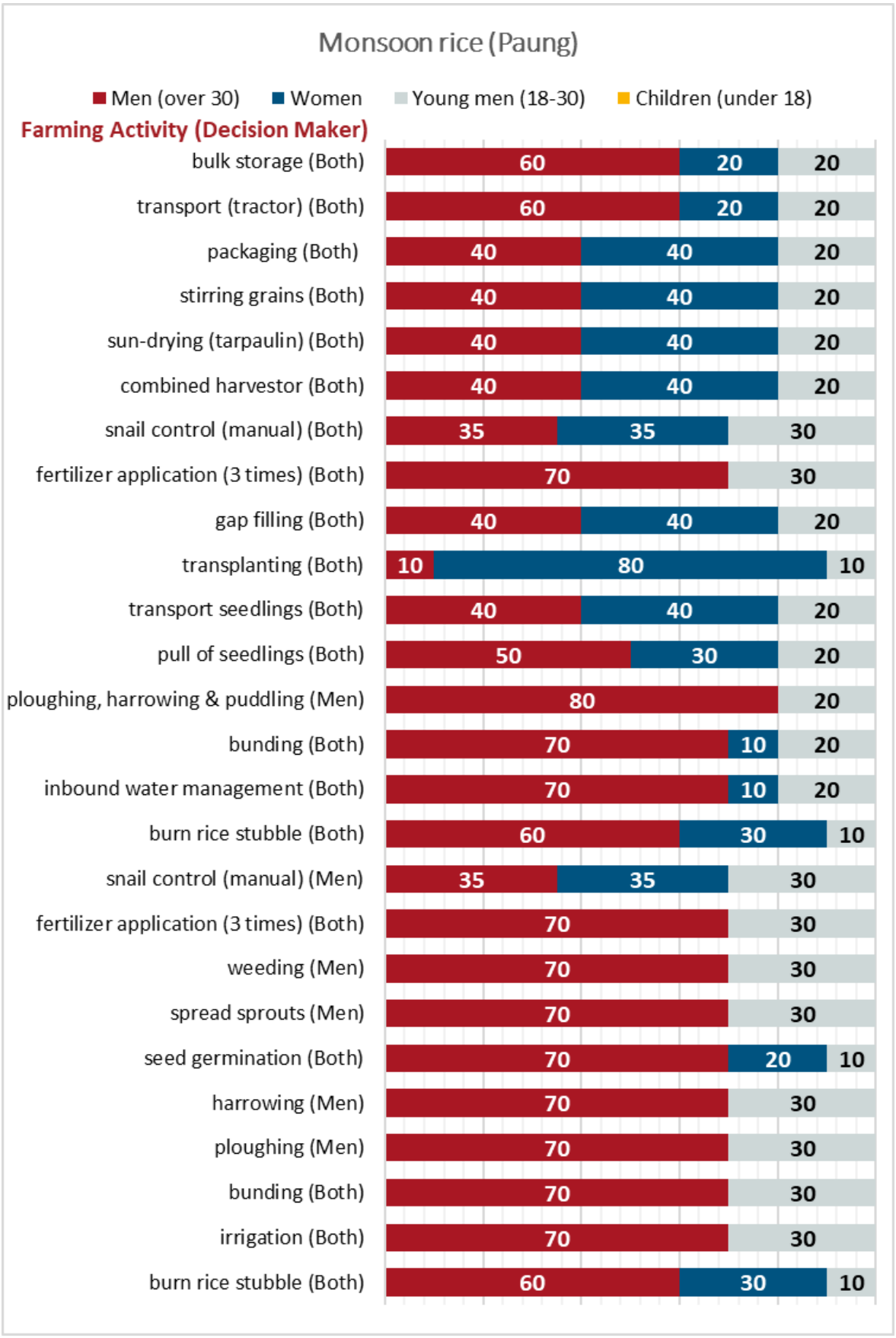
Lowland rice production was observed in all project target villages but with a slight variation in cultivation practices. Lowland rice is cultivated with two seasons (monsoon and summer season) depending on the availability of irrigation facility as observed in Burmese community in Paung and Bilin township. Not all respondents were involved but summer season cultivation was practiced only by those who have access to irrigation system. All the communities of Mon, Karen, Shan, Taung Yoe, Inn Thar, Pa Oh and Burmese were cultivating in monsoon rice. Monsoon rice is cultivated mainly for own consumption and some for sales for investment in agricultural inputs for the next crop season. Even though mainly divided into three cultivation steps, it was found that practices under a particular step were also different in accordance with specific community and location.

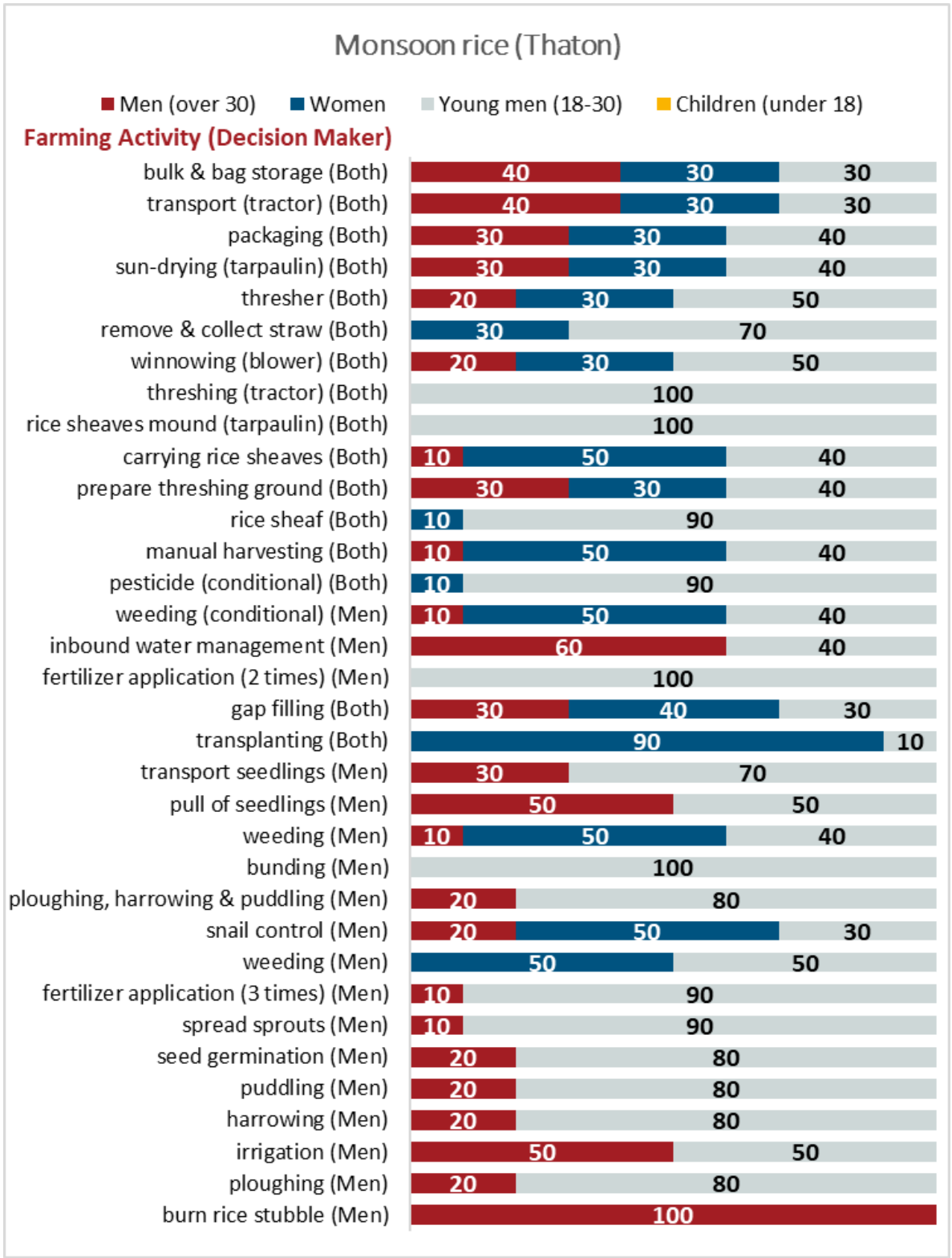
4.2.1.1 Monsoon season rice

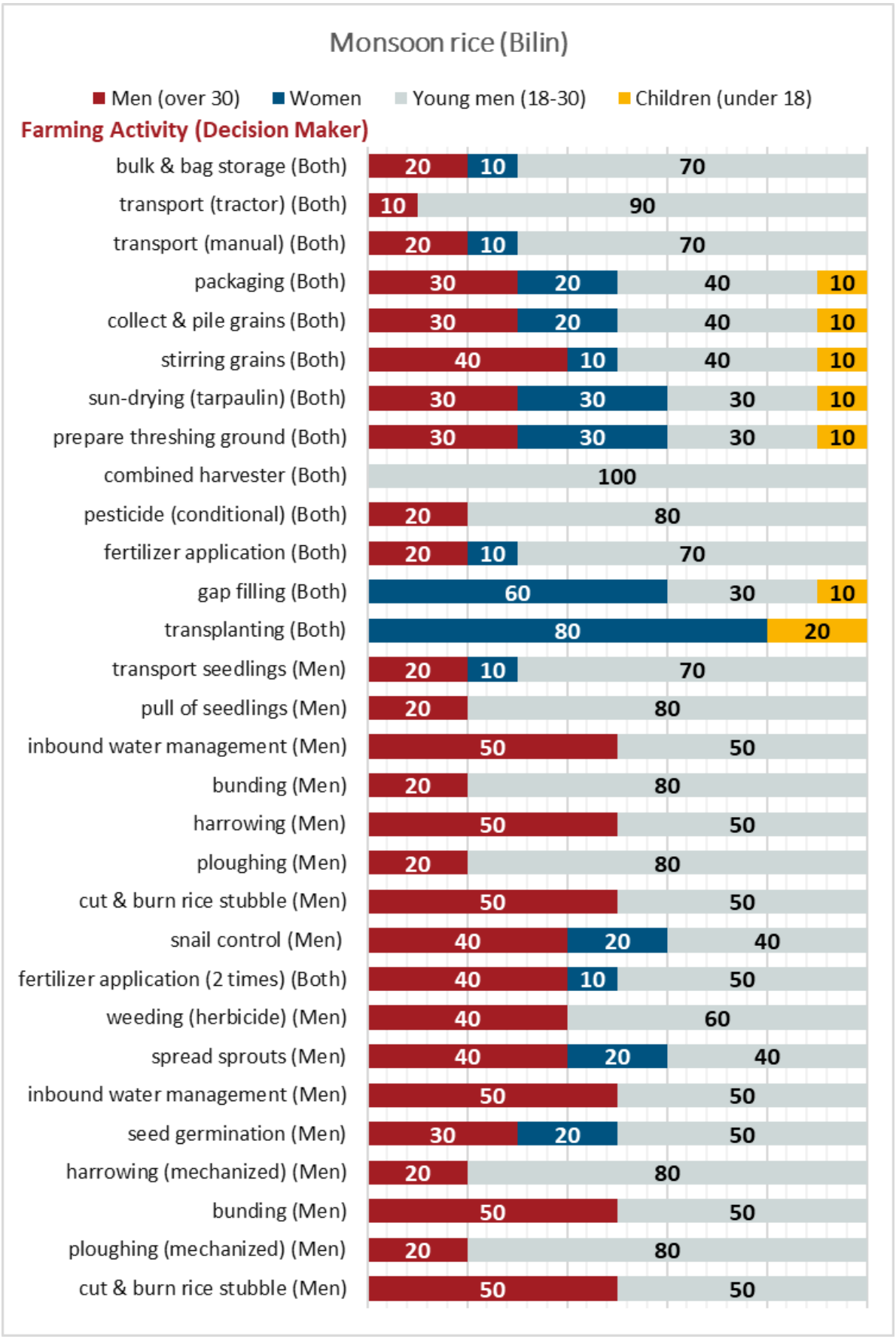
The monsoon season rice cultivation is commonly practiced starting with nursery plot preparation followed by land preparation. Then healthy seedlings were transplanted and protected to be strong by implementing a series of protective and caring practices until the grains became ripe to harvest. The various ways of harvest practices were performed by either manually or machine depending on the available resources and local conditions. The

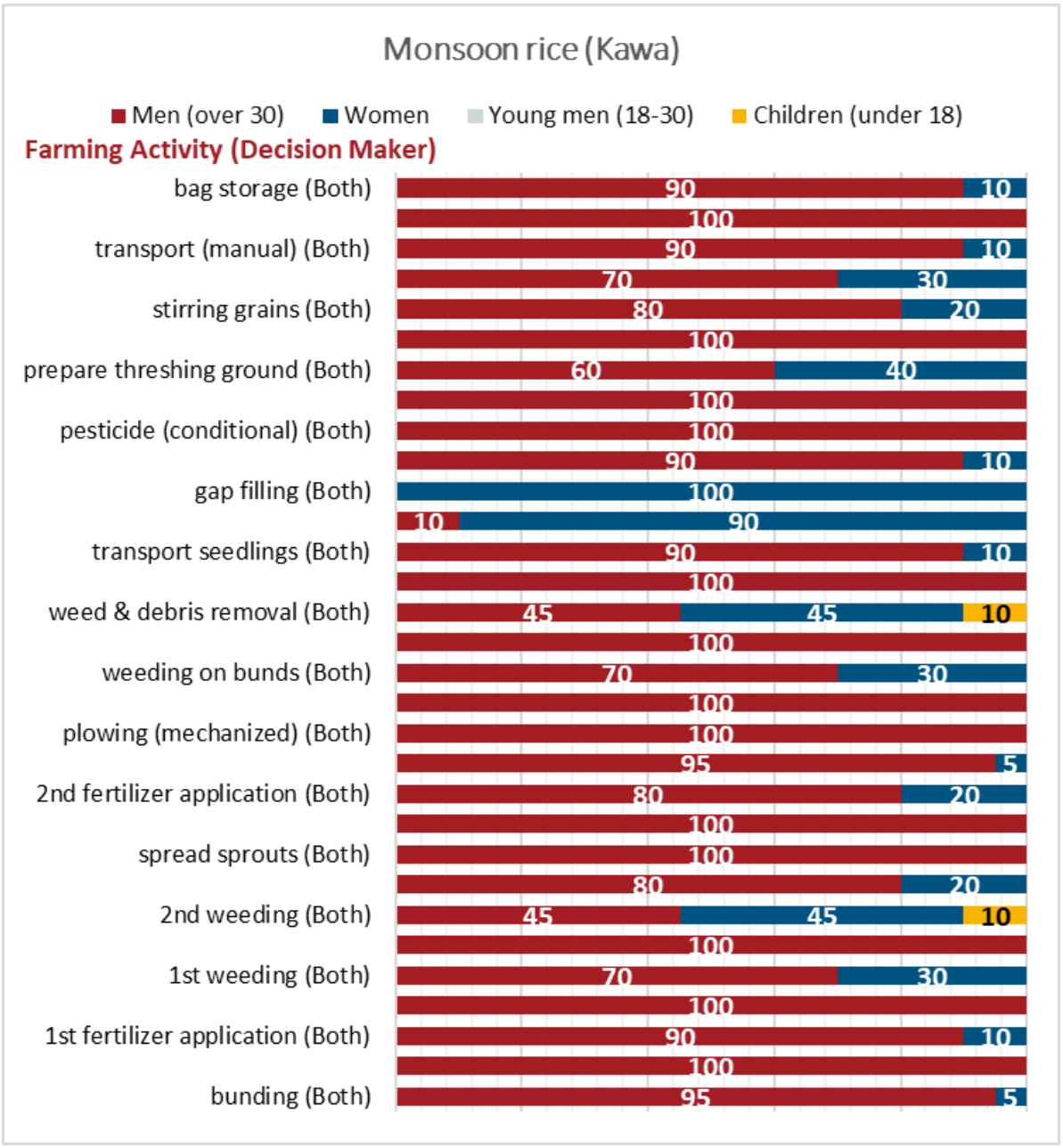
detail gender workload distribution and decision making in monsoon season rice production in different townships is shown in the Figures 5 below.

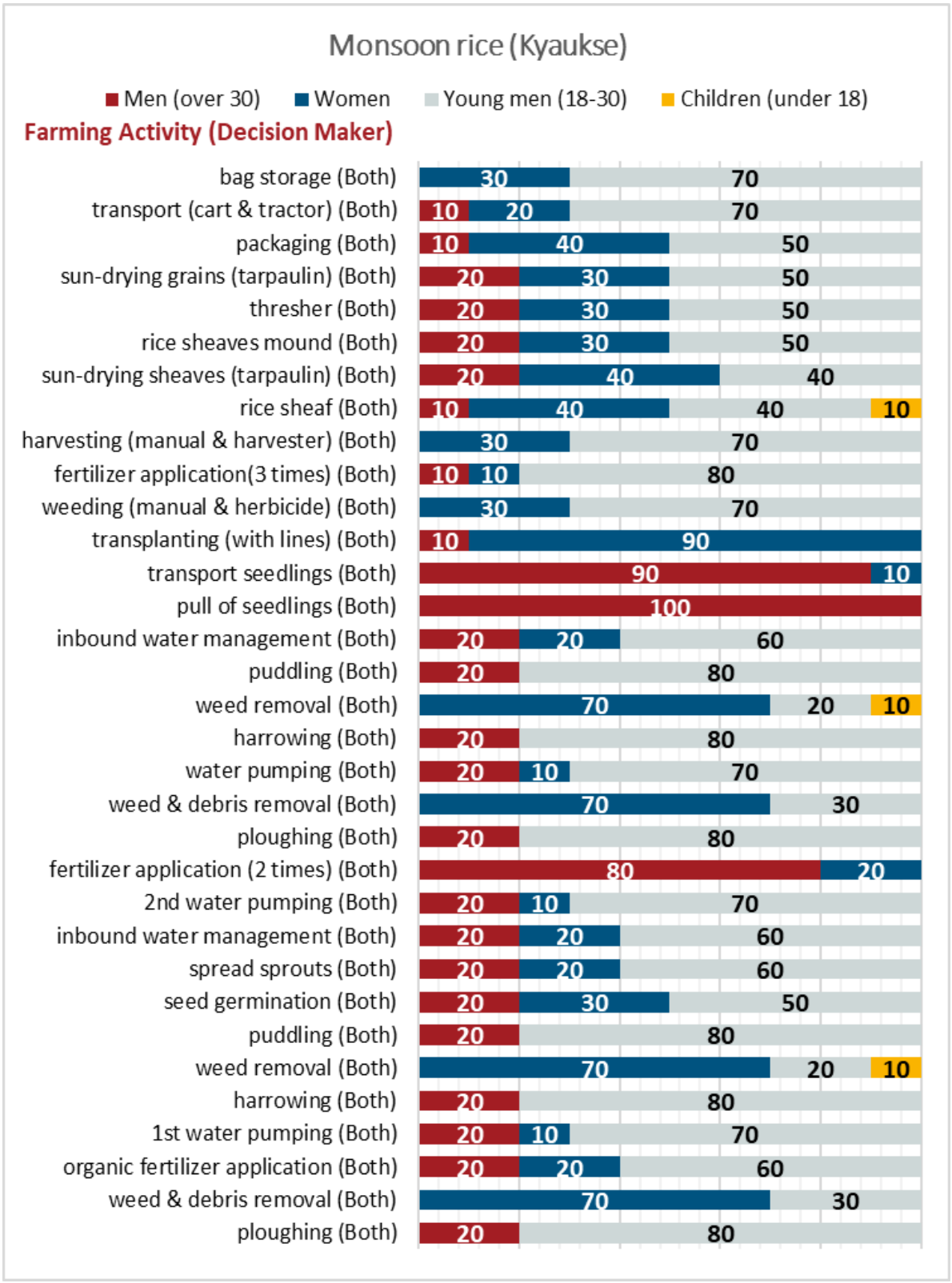


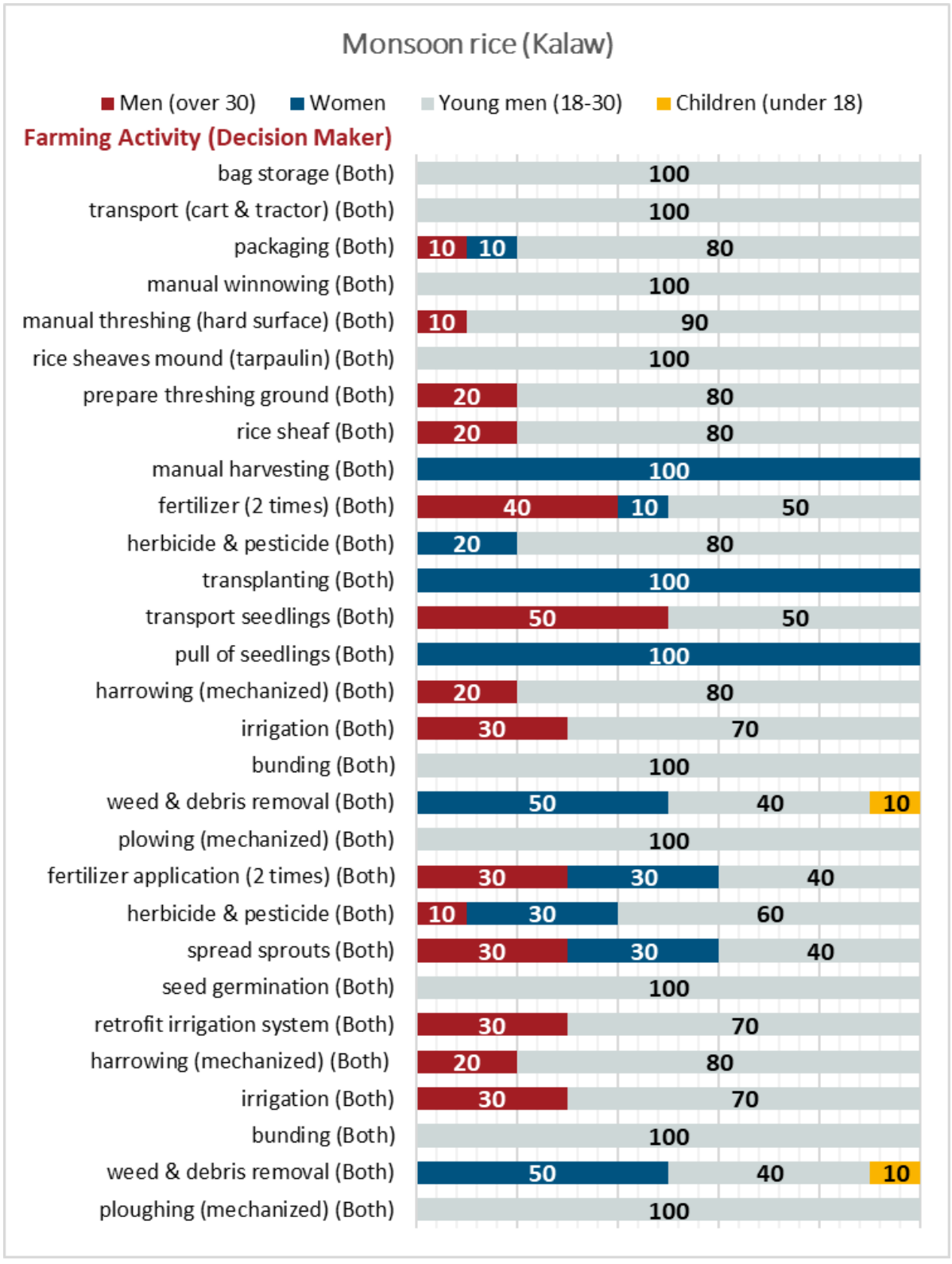

Monsoon rice (Paung)
Men (over 30)
Women
Young men (18-30)
Children (under 18)
Farming Activity (Decision Maker)
bulk storage (Both) 60 20 20
transport (tractor) (Both) 60 20 20
packaging (Both) 40 40 20
stirring grains (Both) 40 40 20
sun-drying (tarpaulin) (Both) 40 40 20
combined harvestor (Both) 40 40 20
snail control (manual) (Both) 35 35 30
fertilizer application (3 times) (Both) 70 30
gap filling (Both) 40 40 20
transplanting (Both) 10 80 10
transport seedlings (Both) 40 40 20
pull of seedlings (Both) 50 30 20
ploughing, harrowing & puddling (Men) 80 20
bunding (Both) 70 10 20
inbound water management (Both) 70 10 20
burn rice stubble (Both) 60 30 10
snail control (manual) (Men) 35 35 30
fertilizer application (3 times) (Both) 70 30
weeding (Men) 70 30
spread sprouts (Men) 70 30
seed germination (Both) 70 20 10
harrowing (Men) 70 30
ploughing (Men) 70 30
bunding (Both) 70 30
irrigation (Both) 70 30
burn rice stubble (Both) 60 30 10

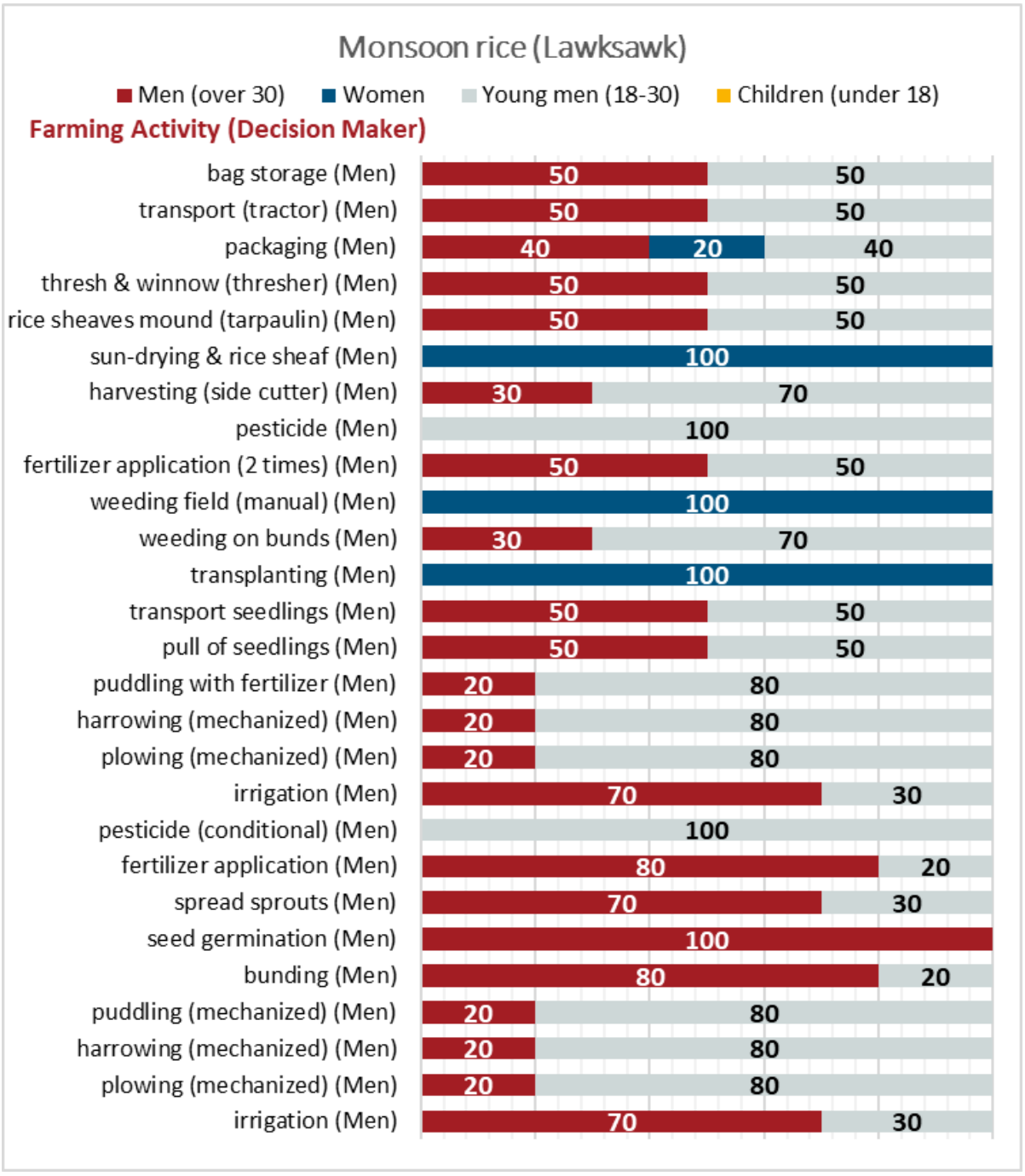

Monsoon rice (Thaton)
Men (over 30)
Women
Young men (18-30)
Children (under 18)
Farming Activity (Decision Maker)
bulk & bag storage (Both) 40 30 30
transport (tractor) (Both) 40 30 30
packaging (Both) 30 30 40
sun-drying (tarpaulin) (Both) 30 30 40
thresher (Both) 20 30 50
remove & collect straw (Both) 30 70
winnowing (blower) (Both) 20 30 50
threshing (tractor) (Both) 100
rice sheaves mound (tarpaulin) (Both) 100
carrying rice sheaves (Both) 10 50 40
prepare threshing ground (Both) 30 30 40
rice sheaf (Both) 10 90
manual harvesting (Both) 10 50 40
pesticide (conditional) (Both) 10 90
weeding (conditional) (Men) 10 50 40
inbound water management (Men) 60 40
fertilizer application (2 times) (Men) 100
gap filling (Both) 30 40 30
transplanting (Both) 90 10
transport seedlings (Men) 30 70
pull of seedlings (Men) 50 50
weeding (Men) 10 50 40
bunding (Men) 100
ploughing, harrowing & puddling (Men) 20 80
snail control (Men) 20 50 30
weeding (Men) 50 50
fertilizer application (3 times) (Men) 10 90
spread sprouts (Men) 10 90
seed germination (Men) 20 80
puddling (Men) 20 80
harrowing (Men) 20 80
irrigation (Men) 50 50
ploughing (Men) 20 80
burn rice stubble (Men) 100


Monsoon rice (Bilin)
Men (over 30)
Women
Young men (18-30)
Children (under 18)
Farming Activity (Decision Maker)
bulk & bag storage (Both) 20 10 70
transport (tractor) (Both) 10 90
transport (manual) (Both) 20 10 70
packaging (Both) 30 20 40 10
collect & pile grains (Both) 30 20 40 10
stirring grains (Both) 40 10 40 10
sun-drying (tarpaulin) (Both) 30 30 30 10
prepare threshing ground (Both) 30 30 30 10
combined harvester (Both) 100
pesticide (conditional) (Both) 20 80
fertilizer application (Both) 20 10 70
gap filling (Both) 60 30 10
transplanting (Both) 80 20
transport seedlings (Men) 20 10 70
pull of seedlings (Men) 20 80
inbound water management (Men) 50 50
bunding (Men) 20 80
harrowing (Men) 50 50
ploughing (Men) 20 80
cut & burn rice stubble (Men) 50 50
snail control (Men) 40 20 40
fertilizer application (2 times) (Both) 40 10 50
weeding (herbicide) (Men) 40 60
spread sprouts (Men) 40 20 40
inbound water management (Men) 50 50
seed germination (Men) 30 20 50
harrowing (mechanized) (Men) 20 80
bunding (Men) 50 50
ploughing (mechanized) (Men) 20 80
cut & burn rice stubble (Men) 50 50


Monsoon rice (Kawa)
Men (over 30)
Women
Young men (18-30)
Children (under 18)
Farming Activity (Decision Maker)
bag storage (Both)
90
10
100
transport (manual) (Both)
90
10
70
30
stirring grains (Both)
80
20
100
prepare threshing ground (Both)
60
40
100
pesticide (conditional) (Both)
100
90
10
gap filling (Both)
100
10
90
transport seedlings (Both)
90
10
100
weed & debris removal (Both)
45
45
10
100
weeding on bunds (Both)
70
30
100
plowing (mechanized) (Both)
100
95
5
2nd fertilizer application (Both)
80
20
100
spread sprouts (Both)
100
80
20
2nd weeding (Both)
45
45
10
100
1st weeding (Both)
70
30
100
1st fertilizer application (Both)
90
10
100
bunding (Both)
95
5


Monsoon rice (Kyaukse)
Men (over 30)
Women
Young men (18-30)
Children (under 18)
Farming Activity (Decision Maker)
bag storage (Both) 30 70
transport (cart & tractor) (Both) 10 20 70
packaging (Both) 10 40 50
sun-drying grains (tarpaulin) (Both) 20 30 50
thresher (Both) 20 30 50
rice sheaves mound (Both) 20 30 50
sun-drying sheaves (tarpaulin) (Both) 20 40 40
rice sheaf (Both) 10 40 40 10
harvesting (manual & harvester) (Both) 30 70
fertilizer application(3 times) (Both) 10 10 80
weeding (manual & herbicide) (Both) 30 70
transplanting (with lines) (Both) 10 90
transport seedlings (Both) 90 10
pull of seedlings (Both) 100
inbound water management (Both) 20 20 60
puddling (Both) 20 80
weed removal (Both) 70 20 10
harrowing (Both) 20 80
water pumping (Both) 20 10 70
weed & debris removal (Both) 70 30
ploughing (Both) 20 80
fertilizer application (2 times) (Both) 80 20
2nd water pumping (Both) 20 10 70
inbound water management (Both) 20 20 60
spread sprouts (Both) 20 20 60
seed germination (Both) 20 30 50
puddling (Both) 20 80
weed removal (Both) 70 20 10
harrowing (Both) 20 80
1st water pumping (Both) 20 10 70
organic fertilizer application (Both) 20 20 60
weed & debris removal (Both) 70 30
ploughing (Both) 20 80


Monsoon rice (Kalaw)
Men (over 30)
Women
Young men (18-30)
Children (under 18)
Farming Activity (Decision Maker)
bag storage (Both) 100
transport (cart & tractor) (Both) 100
packaging (Both) 10 10 80
manual winnowing (Both) 100
manual threshing (hard surface) (Both) 10 90
rice sheaves mound (tarpaulin) (Both) 100
prepare threshing ground (Both) 20 80
rice sheaf (Both) 20 80
manual harvesting (Both) 100
fertilizer (2 times) (Both) 40 10 50
herbicide & pesticide (Both) 20 80
transplanting (Both) 100
transport seedlings (Both) 50 50
pull of seedlings (Both) 100
harrowing (mechanized) (Both) 20 80
irrigation (Both) 30 70
bunding (Both) 100
weed & debris removal (Both) 50 40 10
plowing (mechanized) (Both) 100
fertilizer application (2 times) (Both) 30 30 40
herbicide & pesticide (Both) 10 30 60
spread sprouts (Both) 30 30 40
seed germination (Both) 100
retrofit irrigation system (Both) 30 70
harrowing (mechanized) (Both) 20 80
irrigation (Both) 30 70
bunding (Both) 100
weed & debris removal (Both) 50 40 10
ploughing (mechanized) (Both) 100


Monsoon rice (Lawksawk)
Men (over 30)
Women
Young men (18-30)
Children (under 18)
Farming Activity (Decision Maker)
bag storage (Men) 50 50
transport (tractor) (Men) 50 50
packaging (Men) 40 20 40
thresh & winnow (thresher) (Men) 50 50
rice sheaves mound (tarpaulin) (Men) 50 50
sun-drying & rice sheaf (Men) 100
harvesting (side cutter) (Men) 30 70
pesticide (Men) 100
fertilizer application (2 times) (Men) 50 50
weeding field (manual) (Men) 100
weeding on bunds (Men) 30 70
transplanting (Men) 100
transport seedlings (Men) 50 50
pull of seedlings (Men) 50 50
puddling with fertilizer (Men) 20 80
harrowing (mechanized) (Men) 20 80
plowing (mechanized) (Men) 20 80
irrigation (Men) 70 30
pesticide (conditional) (Men) 100
fertilizer application (Men) 80 20
spread sprouts (Men) 70 30
seed germination (Men) 100
bunding (Men) 80 20
puddling (mechanized) (Men) 20 80
harrowing (mechanized) (Men) 20 80
plowing (mechanized) (Men) 20 80
irrigation (Men) 70 30

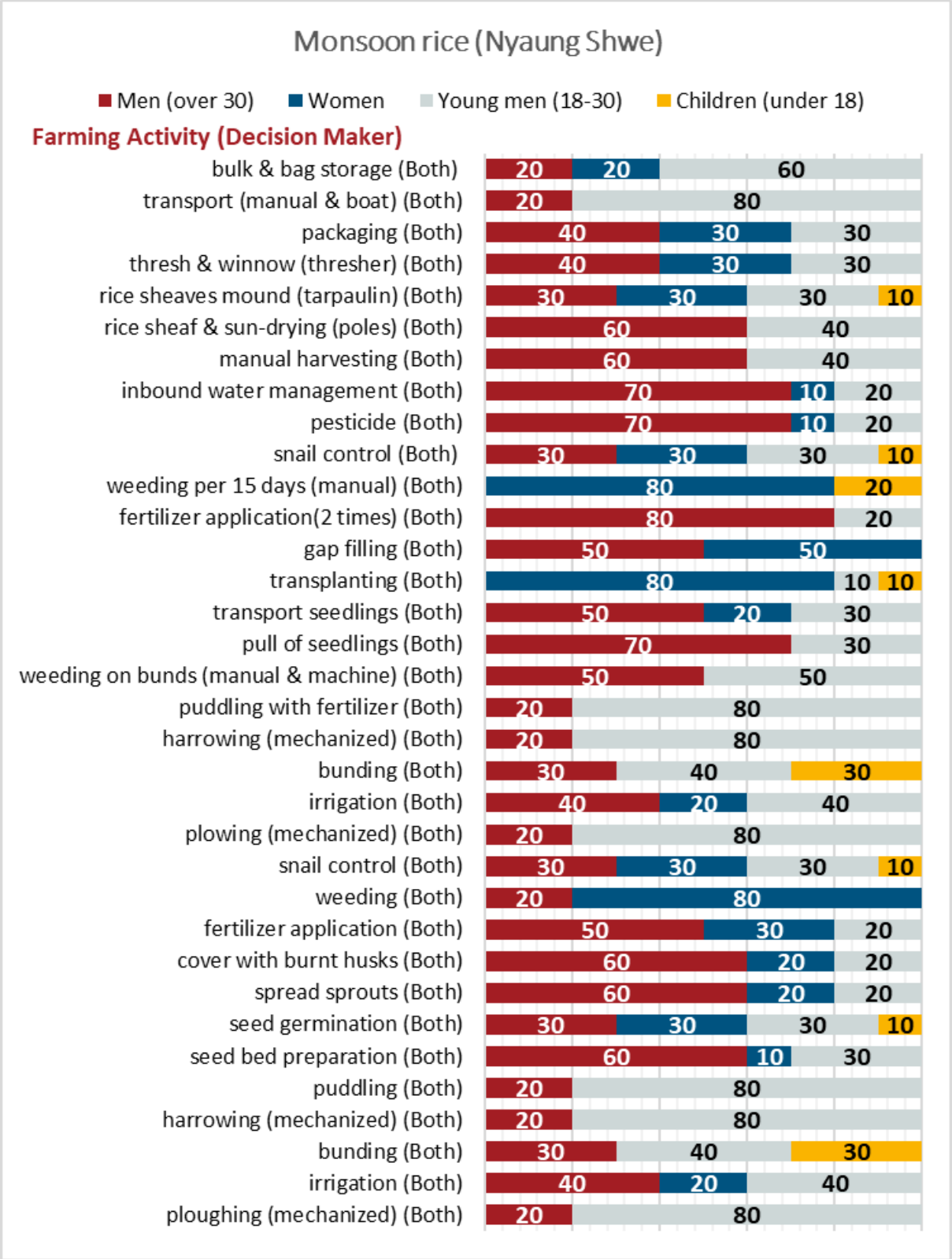


Figure 5 Gender workload distribution and decision making in monsoon rice

The nursery establishment is done by men as it includes heavy works such as ploughing, harrowing, and levelling either manually or using farm machineries. Among men's workload, the distribution between adults and young men also vary among different communities. Burmese in Paung, Kawa, and Mon community rely for nursery establishment on adult men while Burmese in Bilin and Kyaukse, Taung Yoe and Karen community depend on young men. In Shan and Inn Thar communities, both adult and young men equally contribute to nursery establishment. Women from every community except Shan ethnics are involved in this step supporting tasks like debris removal, hand weeding and snail control. Children from their families in Burmese, Taung Yoe and Inn Thar ethnic group are also involved in this task, however, children are helping in their own family farms at the times of school holidays but not as paid labor.

The overall steps of land preparation seem to be done by men, but women also share the role specially in embankment repair and involved in weeding and debris removal tasks. Farm machineries for land preparation are mainly operated by young men as it requires energy, strength and skills. However, few women in some communities also operate farm machineries for land preparation.

Women are responsible for transplanting, pre and post-transplantation activities, and throughout the rice tending steps. Transplanting in all the communities are done entirely by women. Apart from transplanting and gap filling, women are involved in pre-transplanting process like pulling seedlings off and carrying seedlings to rice fields especially in Burmese community in all townships and Taung Yoe, Inn Thar. In tending rice plants, women are mainly involved in manual weeding and collection of golden apple snails. Other contributions by women are pesticide and herbicide application (mostly with spraying equipment), fertilizer broadcasting and adjusting flood level in the fields as in Karen, Taung Yoe and Inn Thar community and also in Burmese communities in Bilin, Kawa and Kyaukse township.

Throughout this process, children from Burmese in Bilin and Inn Thar in Nyaung Shwe township are involved as family labor in some tasks such as transplanting, gap filling, hand weeding and snail collection. Young men are not totally involved as farm labor in Mon community and Burmese in Kawa township while very little with Burmese community in Paung township. Accordingly, adult men are working as main labor force in Burmese in Kawa and Mon community. Young men are observed as main labor forces in Karen and Shan community and Burmese in Bilin township. Equal distribution to tasks among adult men, young men and women was noted in Inn Thar community. Men labor force including both adults and young is commonly working in land preparation process for planting and tending operations which especially need strength and expertise such as fertilizer broadcasting, spraying pesticides, and herbicides. These tasks doesn't seem to need special skills and strength, but in reality, it is very energy consuming to balance and walk in sticky soil while carrying heavy weight, making even distribution of fertilizers and not damaging rice plants while walking in the rice fields. Therefore, women hesitate and are also limited in doing these tasks except in women-headed families.

Gender workload division is diverse amongst different communities in harvest and post-harvest steps. Women workload covers a larger portion in traditional manual harvesting practices however their workload is gradually decreasing as harvesting is done by farm machineries (e.g. combine harvester, reapers, and side-grass cutter). Burmese community in Bilin and Kawa, and Shan community use machines for harvesting so that women have no

workload in harvesting. Geographic conditions limit women working in harvest as in Inn Thar community where harvesting is done rice field is flooded (deep water) and done mostly by men. It was noted that either technology used or geographic condition limit women's involvement in harvesting step.

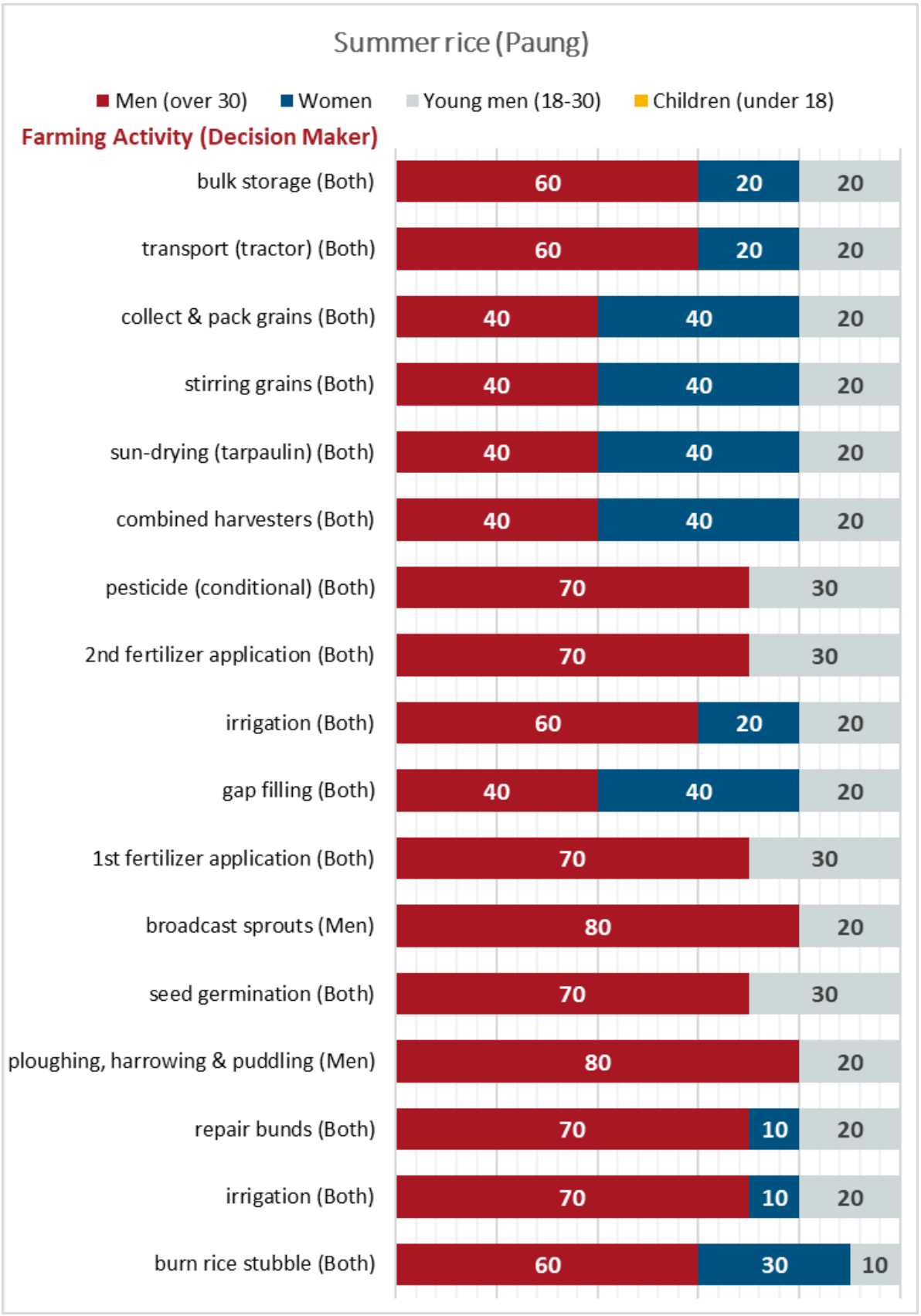
Apart from harvesting, women are involved in bundling rice stacks, preparing threshing ground, carrying and mounding rice stacks, sun-drying, turning grains while drying, transporting and rice storage. Furthermore, women are also responsible for winnowing and packaging grains for storage. When harvesting is done by machines, women collect straw in order to keep it as fodder for cattle. Children are also involved as family labor in some light works such as bundling rice stacks, threshing ground preparation, mounding rice stacks up, sun-drying and turning grains while drying.

Burmese ethnic in Kawa township and Mon ethics, there are no young men involved but only adults are involved in harvest and post-harvest steps. Young dominated workforce is observed in Burmese community in Bilin and Kyaukse, Karen, Shan, Taung Yoe and Inn Thar communities. The communities with less involvement of young men is due to higher rates of migration (both internal and external). In Inn Thar community, the workload is equally distributed amongst men and women.

4.2.1.2 Summer rice (Irrigated rice)

Summer rice production is generally men-dominated as shown in the Figure 6 as most of the activities are performed by using farm machinery. Women are involved in different steps by supporting some tasks and as a helper. In comparison, women in Paung township contribute more tasks than in Bilin. Women contribution is also uneven between two Burmese communities. In Paung township, women are involved in rice stubble burning, irrigation, repairing bunds, gap filling, harvesting, sun drying, turning grains, packaging, transporting and storage. Women from Bilin is observed working in seed germinating, sprouts broadcasting, fertilizer application, threshing ground preparation, sun-drying, turning grains while drying, packaging, transporting and storage. Only children in Bilin are involved as helpers or family labor in some light works such as threshing ground preparation, sun-drying, turning grains and collecting well-dry grains.

Among men workforce, young men are more involved in Bilin than Paung community. The possible reason is higher rate of migration of young men in Paung community than in Bilin.


Summer rice (Paung)
Men (over 30)
Women
Young men (18-30)
Children (under 18)
Farming Activity (Decision Maker)
bulk storage (Both) 60 20 20
transport (tractor) (Both) 60 20 20
collect & pack grains (Both) 40 40 20
stirring grains (Both) 40 40 20
sun-drying (tarpaulin) (Both) 40 40 20
combined harvesters (Both) 40 40 20
pesticide (conditional) (Both) 70 30
2nd fertilizer application (Both) 70 30
irrigation (Both) 60 20 20
gap filling (Both) 40 40 20
1st fertilizer application (Both) 70 30
broadcast sprouts (Men) 80 20
seed germination (Both) 70 30
ploughing, harrowing & puddling (Men) 80 20
repair bunds (Both) 70 10 20
irrigation (Both) 70 10 20
burn rice stubble (Both) 60 30 10

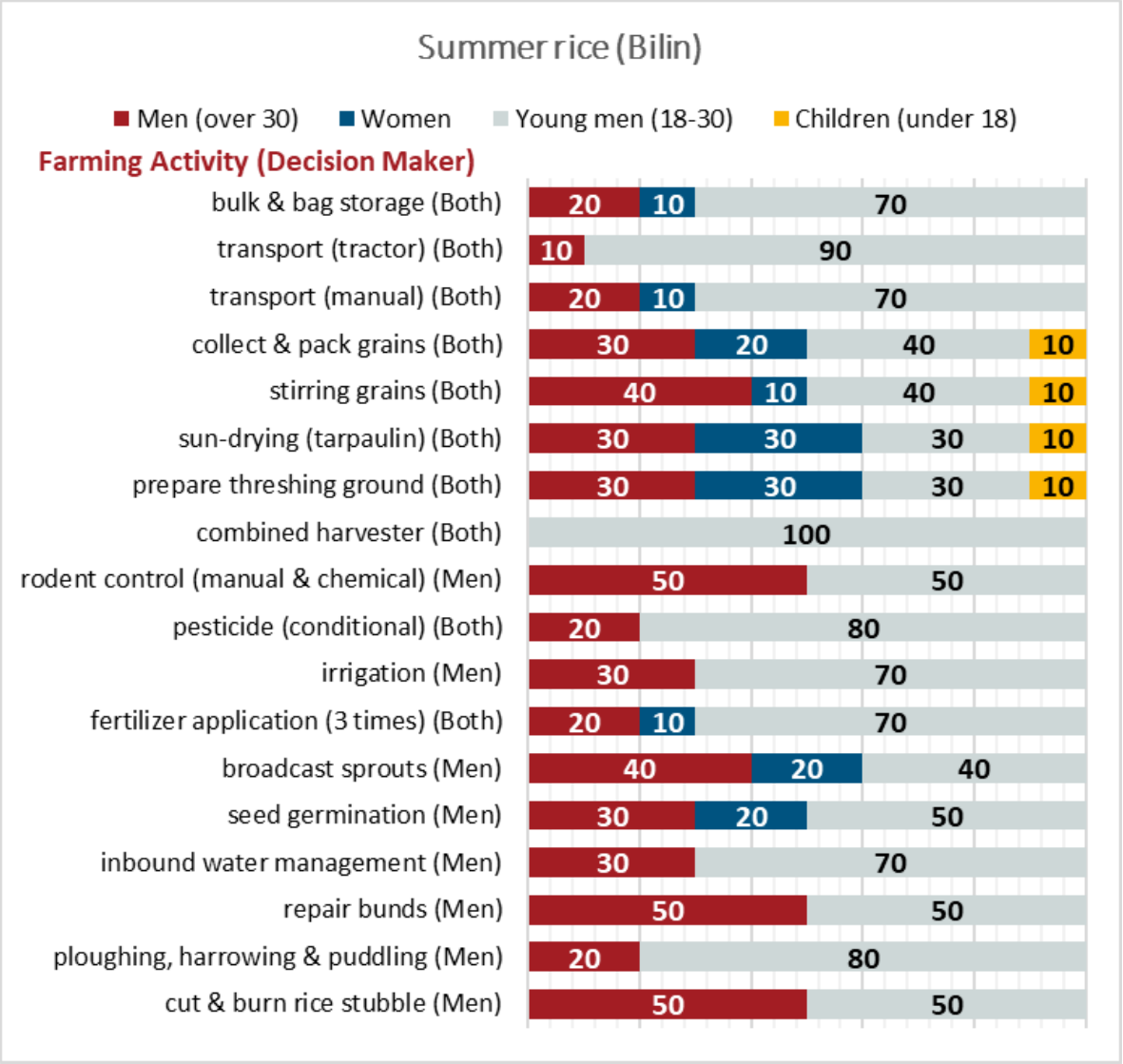


Figure 6 Gender workload distribution and decision making in summer rice

4.2.2 Upland rice

While observing workload division in upland rice production, it is mostly men-dominated especially young men as shown in Figure 7. Women are involved fully in in debris removal, hand weeding and harvesting but a few portions in organic fertilizer application, pesticide application and packaging rice grains. Children from the family help in organic fertilizer spreading. Adult men involve in fully responsible for broadcasting because these adults are skillful in managing evenly distribution of seeds. The reason of young men dominating the workload is related to family bond in which family member relationship is firmly held.

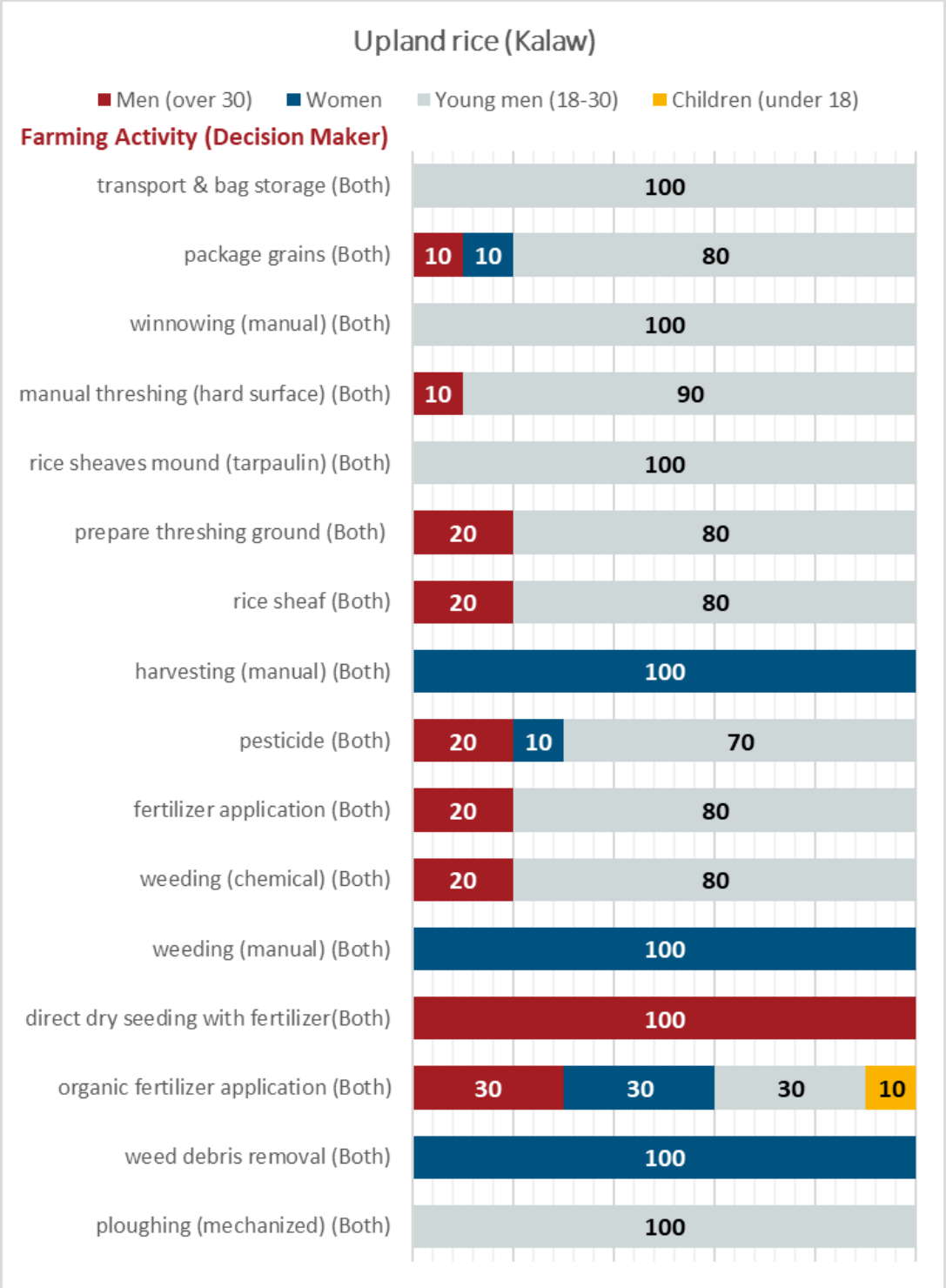


Figure 7 Gender workload and decision making in upland taung-ya rice

4.3 Decision making in rice production activities

The decision making in different steps of rice cultivation activities for monsoon, summer and upland rice is given in Figures 5, 6 and 7.

The study found that apart from the Shan community in Lawksawk township, women mostly participate in the decision-making process together with men in rice farming either in all steps or some steps.

Mon women in Kyaikmaraw have limited spaces in decision-making power. They are only involved in three steps: manual snail control, gap filling and storage steps. This can be due to the influence of cultural perception. Many Mon women mentioned that men should know their responsibilities in timely manner. They also described that if women discussed what men should do, they are afraid that those responsibilities are shifted to women.

In the two other study areas, Karen in Thaton and Burmese in Bilin townships in Mon State, men are the sole decision makers in all preparation steps, rodents control and fertilizer application in the planting and tending stage while women are involved in the decision-making process of all other steps.

In the rest of study sites, both men and women have equal decision-making power in all rice cultivation steps. The study found out that women are consulted by men what, when and how they should do or buy tools or things including types of seeds for the rice farming. They described that even when men take a decision-making role, they always listen to women's opinions. It could be assumed that more than 70% of women have equal role in decision making power in farming activities together with husband or other family members. Even in some men-headed households, women play a managerial role for the whole process of farming without actual delivering labor in the field. The FGD in Kawa Township mentioned that after men labors are replaced by machines, only agricultural technician may need to work in the farm. In that case, it is woman who asked and guided when, who and how should the hired labor do.

4.4 Contribution of women in livelihoods security

4.4.1 Rice production

The contribution of women in workload among different communities is shown in 6 where green color represents sole responsibility of women, purple color represents more women contributions and yellow color is equal contribution between men (adult and young) and women.

	Kyeikma raw (Mon)	Paung (Burmese)	Thaton (Karen)	Bilin (Burmese)	Kawa (Burmese)	Kyaukse (Burmese)	Kalaw (Taung Yoe)	Lawkawk (Shan)	Nyaung Shwe (Inn Thar)	Average Gender Workload
land preparation step										
Nursery plot preparation										
burning rice stubble										
weed and debris removal										
planting and tending step										
transport seedlings										
pull of seedlings										
transplanting										
gap filling										
inbound water management										
snail control (manual)										
pesticide application										
fertilizer application										
weeding										
harvest and post-harvest steps										
combined harvester										
harvesting										
rice shafe bundling										
sun-drying										
prepare threshing ground										
rice shaves mound										
threshing (cattle)										
threshing (thresher)										
winnowing (blower)										
remove & collect straw										
stir grains for well dry										
collect and pack grains										
transport (men & tractor)										
storage										

Index	
	only by men (adult & young)
	only by women
	jointly but more men (adult & young)
	jointly but more women
	jointly by both men (adult & young) and women

Table 6 Overview of gender workload in rice production steps among study communities

The study found women contributed their efforts in rice production as full percentage of workload in transplanting however their workload can be seen in every activity although in smaller portion in heavy or farm machinery works. The other tasks in which women are commonly involved are mainly manually operated works such as debris removal, weeding, collecting snail, nursery plot and threshing ground establishment. While operating thresher, women take some tasks such as collecting grains or fetching straws for fodders. Women

labors in rice production are observed as either family workers or paid labors. In different agro-geographic and sociocultural conditions, women contributed mainly in manual transplanting and harvesting, however manual harvesting is declining due to introduction of farm machineries.

4.4.2 Income distribution

The factors that determine if rice cultivation is the major source of income for women or the family depends on availability of job opportunities, production of rotational crops and remittance.

In the case of Burmese community in Paung and Bilin townships which produce rice in two seasons (monsoon and summer paddy), working in the rice field is as a wage labor for women is an opportunity that could guarantee work at least for 8 months in a year. For Burmese in Bilin Township, many families temporarily move to Thaton to work in brick factories after rice production season is over.

In the case of Burmese community in Kawa township, income from rice farming is crucial only if they are from a poorer family. Other households do not perceive it as major income opportunity due to temporary nature and availability of year-round job opportunity in the garment factory located in Intakaw where free shuttle bus is arranged by factory to commute from and to the factory. Thus, only for the women who do not have enough money to attend the professional tailor training will stay at the village and rely on income from the rice farming. When Kyaukse is closely located to the Kyaukse and Mandalay Industrial Zones and community itself having year-round seasonal cash cropping, income from rice farming is not significant to other sources of income.

It was mentioned that wages are essential for women in poor and mid-level income households as it is more likely to support the basic needs of family survival by earning or saving the cash flow for hiring labors. Some pregnant women have to work until their 2nd and 3rd stage of trimester in the rice farming which revealed how much rice farming is essential for livelihood and security. Women work approximately for 8~9 hours to earn an average rate of MMK 5000 to 6000 per day without meals whereas men could earn MMK 6000 to 8000 per day for the same working hours as women. The labor wage for men and women in rice faming is shown in Table **7**7.

Table 7 Working hours and wage labor in rice farming & other seasonal job

Township	**Ethnics community**	**Average working hours**	**Average wage for labor (MMK) (rice farming/ other seasonal agricultural job)**	
			Women	Men
Kyeikmaraw	Mon	9	5000 - 6000	7000 - 8000
Paung	Burmese	8	5000 - 6000	7000 - 8000
Thaton	Karen	9-9.5	5000 - 6000	7000 - 8000
Bilin	Burmese	9	5000	7000
Kawa	Burmese	9	5500	9000
Kyaukse	Burmese	9	5000	7000
Kalaw	Taung Yoe	8	6000	6000
Nyaung Shwe	Inn Thar	8	6000	7000
Lawksawk	Shan	7.5	5000	5000

The study also found that women working in the rice cultivation will have high chances of becoming wage labor either in seasonal cropping and orchard or self-employment jobs such as vendor or small grocery shop owner as described in the Table **8**8. As wage labors, the same rate of wages paid for rice farming is applied for equal working hours. The only difference is rate between men and women. In term of wages, differences are only between light work or heavy work or the amount of workload. Women are paid less by saying that men could finish much workload and could do much. It can also be interpreted that men are paid higher than women due to the scarcity men labor in the villages except Lawksawk where equal pay between men and women is found. On the other hand, it can also be the supply of women labor is higher than the demand across the study areas. In Lawksawk, there can be sufficient men labor. It can be linked with migration issues in those areas as it was observed that where there is unavailability of jobs at their own village, internal migration to the nearest places or external migration to Thailand to find better job is common. Other remarkable thing is that the daily wages are higher than the minimum wage for per day standardized by the Minimum Wage Law 2015.[22]

Except Burmese community in Kawa and Kyaukse, and Shan in Lawksawk, the FGD revealed that rice farming contributes to at least 50% of their income. Thus, income is important for women not only to supplement the family living costs but also for their dignity, self-esteem, mental security, tranquility and self-development. In the household, women is assumed as finance manager and guardians of family well-being which mean they have to manage and monitor where and how the money are spent such as health, education and social activity. Men normally hand over all their income to women. Being finance manager at home, women have full knowledge of monthly income and expenditure whereas men do not know. When family income is less than expenditure, it becomes a source of argumentative reason for husband and wife. Women dare not spend the money for her parents if they are fully dependency on husband. Having ability to manage their own income freely to support their parents, living costs of the family and children's tuition fees, income of women can make them feel mentally secure, tranquil and confident. They feel proud of themselves for their contribution. When women lose their self-confidence and self-esteem, it gradually impacts on women's dignity.

Most of the men who participated in the study appreciated economic contribution of women. However, they did not see it is fairly important due to not seeing major breadwinner of the house and seeing as assistant of husband. Respondents from Shan community in Lawksawk, even mentioned that women should not participate in the income generating activities as they have their more responsibilities in the house such as housekeeping works.

Table **8**8 shows secondary income generating sources of women for family livelihood and security in the study communities.

[22] The minimum wage per day was approved to increase from 3600 kyats to 4800 kyats in 2018.

Table 8 Secondary income generating opportunities

Township	Ethnic	Wage employment	Self-employment
Kyeikmaraw	Mon	□ rubber plantation □ melon farm	□ home-based grocery shop □ vegetables gardening for domestic consumption and selling some extras
Paung	Burmese	□ commercial fish breeding □ brick factory	□ home-based grocery shop □ head carry vendor □ livestock breeding for domestic consumption and selling
Thaton	Karen	□ processing of dried fish □ commercial live-stock breeding	□ small grocery shop □ sewing □
Bilin	Burmese	□ brick factory in Thaton	□ small grocery shop □ sewing □ head-carrying vendor
Kawa	Burmese	□ Garment factory in Inntakaw □ harvesting pulses and weeding in the bean farm	□ small-scale livestock breeding
Kyaukse	Burmese	□ vegetable farming such as onion and chili □ waged labor in pulse farm □ Mandalay Industrial Zone □ Kyaukse Industrial Zone	□ buying and selling things for profit
Kalaw	Taung Yoe	□ vegetables farming such as lettuce, cauliflower, potato, onion and garlic □ seasonal flowers □ wheat farm □ ginger farm □ groundnut	□ selling seasonal vegetables □ small grocery shop □ making dried tofu cracker
Nyaung Shwe	Inn Thar	□ vegetable farming such as eggplant, onion and pumpkin □ corn, □ groundnut,	□ making/ wrapping cheroots □ weaving, □ selling flowers □ selling snacks
Lawksawk	Shan	□ corn □ onion	□ street vendor to sell tempura and snacks

4.4.3 Domestic and social works

Across all study sites, there are common cultural patterns of the division of labors among men and women such as doing housework and taking care of child and elderly persons are the tasks of women and income generating is the task of men. When both women and men were asked about norms and values regarding women's roles and responsibilities at home, all of them firstly responded that there is no division of labor. When they were asked another question of who does what at home. Almost all the people responded that women's jobs are to manage kitchen, raising children, care giving to the elderly persons, washing dishes and doing laundry whereas men's tasks are doing laborious job at home such as fixing the machine, constructing the temporary donation hall in the village, etc., and earning money to support the family as the breadwinner. Women are also expected to perform manager of family income in most of the places. As discussed in the previous section, when women are involving in the income generating process, women have to bear double work. Men share those house works only when women are unavailable at home such as sick or going out for

social activity. Being responsible person of housework, women have to get up around 3 hours earlier than men to prepare meals for the whole house before going to the farm. After coming back from the farm in the evening, they have to prepare dinner for the family and do similar housekeeping process again which also take at least 3 hours again. If there are other women at home, they are going to share those responsibilities.

Nonetheless, exceptional cases of equal division of labor are found at Taung Yoe and Inn Thar community where women and men do together for house works and income generating. In most of the cases women have less leisure time and work both for taking care of the family and earning family livelihood. Moreover, they do not mention or notice about how much extent their double working hours can gradually impact on their health in the long term. What was discussed in the FGDs is only about temporary sickness due to working in the rice-field.

Social occasions such as donation ceremony, wedding ceremony, funeral ceremony, religious activities, village development or welfare meetings are common activities which women spend their time. The actual number of hours women depends on the size of events, volume of the workload, the closeness with the event organizers. If it is big event, women may spend the whole day to provide a helping hand. If the organizer is just an acquaintance, they spend 1-2 hours. If it is a relative's event, they spend 3-4 hours. If it is community development meeting, they spend 2-3 hours a day.

In the case of Burmese community in Kyaukse township, it is common for women to spend almost 2 days (pre-ceremony day and actual ceremony day) in helping necessary things in the donation ceremony. Women in Shan community said that in the case of donation ceremony, both men and women give a hand for 3 days whereas 2 days for the wedding ceremony. Normally, they get up at 3 AM in the morning to cook food, go back home around 12 noon. It is common for women to finish their daily housework before joining those social activities.

4.5 Gender related limitations in rice production

There are various factors that influence the participation of women and men in the rice production activities. They can be grouped as structural and cultural factors. It should also be noted that most of the cases are difficult to pin-point or separate from each other as culture and structure are intertwined. For example, women are required to stay at home when they have to take care of children, sick persons or elders because working outside particularly at a distant place makes them difficult to be back home on time for preparing meal for those who need care. In this example, there are two underlying causes. There is no established system for day care centers in the community which is a structural barrier and assuming that women are the only ones who have to take these responsibilities is a cultural barrier.

4.5.1 Structural limitations

Remoteness and having the rice fields away from the home like in Inn Thar Community and not having day-care centers in the villages hinders participation of women in rice cultivation or as daily wage laborers as they do have to prepare food and take care of the elderly people and children. It can be also assumed that if the rice field is nearby, women can go to field within very short period and work. Although women do most of the manual harvesting, it is not the case in Inn Thar community as harvesting is done during in flooded fields by men. Doing to change those structural barriers may be out of this study especially for deep flood

situation. The alternative and easy way to solve this issue can be to have a community-based child and elders care centers and two or three women voluntarily taking care of them and the other working women contribute a small share for the wages of those assigned women.

Another limitation is due to the use of farm machines or tools which is not women-friendly or old men friendly so their participations in the rice field is gradually reducing. It was reflected in the Burmese community in Kawa township that only men labor is used in all stages where farm machines are used e.g. for ploughing, harrowing, puddling, harvesting, threshing, winnowing and transporting with combined harvester, tractor, etc. It was also found that the use of farm machinery which is easy and proportional with women's body structure and strength are required to increase the engagement of women and men in rice production stages. Though it could save their time, unfamiliarity with those technologies and difficulty to start the engine are the other identified constraints faced by the women. In some places like Karen community in Thaton and Inn Thar in Nyaung Shwe, they would like to know or be trained properly on the operation and maintenance of farm machines and be confident in using by themselves. This indirectly meant that women are limitedly and directly received the training on farm machinery tool due to the traditional norms of seeing men as capable persons or stronger enough person of handling machines than women.

4.5.2 Socio-cultural limitations

Traditional believe of (1) physical weakness of the women and (2) seeing women as the primary duty bearer of house works and responsible for safeguarding of family income and (3) seeing them as helpers of men in the rice production makes them less visible of their direct and indirect contribution in most of rice production stages.

Women do not directly participate in the applying fertilizer and pesticide which need to carry heavy bag or bucket. Similarly, most of the women said they cannot do seed sprouting by themselves because seed bags are normally big and wet seed bags are heavy to carry. In the case of using different machinery, almost all the respondents explained that strength is required to operate the engine starter.

Those cultural perspectives restrict both women and men in thinking of their potential abilities of how they can do or how they can overcome those constraints. When asked why men were responsible for certain activities and why women did not do, most of the respondents indicated that women know how to do, but they have less experiences than men which causes to consume more time and less organized in the field. Sometimes, women even do not think it can be their jobs. For example, many women responded that if they tell men what they should do and how to do, it will become their responsibility to do the job. Therefore, it is assumed that men should know what they have to do and how they have to do by themselves. During the activity mapping process, the description and detailed steps of rice farming process including when and how to apply fertilizer and pesticide by women was almost identical with how men described. The meaning is that women know the processes but, rarely do it saying men have expertise in those tasks. This also meant that they have not get a chance of practicing systematic and efficient ways of applying fertilizer and pesticide since they were young.

Women would not apply their potential unless they are required to struggle for survival and unless they are in the open-minded family. There were no tasks from which men or women were prohibited from doing, and both men and women acknowledged that women were

capable of doing all farm activities if men were absent or in woman headed households. This situation was in Karen and Taung Yoe community where a woman mentioned that she did seed germination and sprouting herself by separating heavy seed bag into smaller bags to be able to carry as there are no man at home to work in the rice field. This situation at least revealed that there are potential ways that could be improved for women even there are structural and cultural barriers.

All the FGDs revealed that culturally, there are no restrictions for women to work outside. Men did not highlight that women should be at home or work only together with them. Moreover, it was revealed from the household data that women from some of the villages migrate for better job opportunities. The flexibility for women empowerment through cultural perspective were also found due to the higher decision-making power most in the study sites as discussed in the previous section. The report found that apart from Burmese in Bilin township, Mon and Shan community, women have equal decision making power in the household levels in regard with rice farming process such as selection of seeds, time to apply and type of fertilizer and pesticide. Not having any cultural constraint for women movement and having equal decision-making power are positive ways to create alternative job opportunities. However, men in Lawksawk mentioned that women are better to stay home for housekeeping by saying that income generating is not women job. In that case, men intend to block women empowerment in all fields.

Both men and women participants in all study sites said that in the village, due to the openness and development, the use of force against women and children within a family has been declining during these 2 or 3 years. Except 1 or 2 families which use beating or slapping, there are not such kinds of domestic violence in the village. What happens usually is just a normal dispute, fighting, verbally shouting and scolding which are common between husband and wife. Apart from serious cases which were reported to the different levels of administrators in the village, most of the issues are solved within the family members. One of the common issues which trigger to argue between husband and wife revealed by women participants is related to the financial issues. The summary of gender-based constraints is described in Table 9.

Table 9 Summary of gender-based constraints

SN	What constraints are faced in general	Causes / factors leading to GBC
Women		
1.	Excessive workload and time poverty (women are primarily responsible for housework, child and aging people care)	• Not having other persons to help • Culturally confined as women's job
2	Unable to use farm machines & unfamiliarity with machine on how to operate and maintain	• Physically weak to use, • Application of heavy agricultural / farm machines difficult for women to operate • Lack of sufficient training targeted to women
3	Lack of experiences in application of fertilizer, spraying of pesticide and herbicides	• Broadcasting these inputs need to be systematic and efficient (no loss) • People are afraid that rice plants can be destroyed or damaged due to the unskillful persons (systematic, careful observation, judgement and decision making is required)
4.	A lot of labor-intensive works	• Fertilizer bag are big and pesticide buckets (normally 5 gallons bucket is used) heavy to carry

		alone • Wet seeding bag is much heavier after sinking in the water for seed sprouting • Cleaning seedlings are also labor- intensive process which women hardly can do
5.	Limited chances to spend longer time in the field	• Women have to take care of children and elders to serve meals in time

4.6 Potential impacts of adopting sustainable best practices (SBP) on gender

4.6.1 Current situation

By screening the sustainable best practices (SBP) as described in the SRP Standard for sustainable rice cultivation[23], the study observed that some of the SBP are already implemented by the communities. However, the intensity of application was different due to the perception of these practices and local conditions. The SBP described in this study related to resources-efficient practices (REP), labor rights, personal safety and good farm management practices of the SRP Standard. The SBP and its application among the different communities is mentioned in Table **10**10.

There are 27 sustainable practices recorded from PAR, FGD and KII processes falling under 8 themes comprising of 2 farm management practices, 6 pre-planting practices, 2 water use practices, 2 nutrient management practices, 4 integrated pest management practices, 6 harvest and post-harvest practices, 1 health and safety practices, and 4 labor rights practices.

Burning of rice stalks is possibly linked with the outbreak of golden apple snails mostly occurring in the coastal areas with Karen community in Thaton township, Burmese in Paung and Bilin township. These areas are severely affected by outbreak of invasive snail species however one exception is noted in upland community in wetlands of Nyaung Shwe township. Though having severe effect of snail, rice stalks are not burnt as harvesting is done during flooding. However, the ecological solutions are found in all communities where these snails are manually collected and removed instead of using chemicals. In some communities such as Burmese in Paung township, the captured snails are consumed by the family and also sold in the market for extra income. The similar solution was in rodent control in Burmese in Bilin township where rodents are captured with traps and also controlled by destroying their nests instead of using chemicals. Then, these collected rodents are consumed as a rich source of dietary protein. The most common means of sustainable management practices is weed control by manual weeding among all communities even a few farmers used herbicides but very rarely.

[23] SRP, 2019, The SRP Standard for Sustainable Rice Cultivation (Version 2.0), Sustainable Rice Platform. Available at http://www.sustainablerice.org

Table 10 Sustainable best practices and its application by study communities

Sustainable Best Practices	Kyeikmaraw (Mon)	Paung (Burmese)	Thaton (Karen)	Bilin (Burmese)	Kawa (Burmese)	Kyaukse (Burmese)	Kalaw (Taung Yoe)	Lawkawk (Shan)	Nyaung Shwe (Inn Thar)
Farm Management									
Crop calender									
Record keeping									
Pre-Planting									
Invasive species									
Leveling									
Seed treatment before germination									
Effective seedbed preparation									
Line seeding (hand seeding machine)									
Systemitic line transplation									
Water Usage									
Alternative wet and dry method									
management (using 6* pipe)									
Nutrient Management									
Dry manure application (organic fertilizer)									
Effective use of chemical fertilizer									
Integrated Pest Management									
Hand weeding									
Effective use of pesticide and herbicide									
Snail control (manual)									
Rodent control (manual)									
Harvest and Post-Harvest									
Timing of harvest									
Harvest equipment (manual & mechanized)									
Drying technique									
Rice storage									
Not buring rice stubbles									
Rice straw									
Health and Safety									
Personal protective equipment									
Labor Rights									
Child labor									
Education									
Wages									
Farmers networking									
INDEX									
Application (Strong level)						(Low level)			
Non application									
No data									

Some SBP are consuming more resources such as preparation time, money, technology, farm machinery, labor, and skill while some demanding not many resources. The application of SBP was noted as defined by the local geographic conditions, available resources and local perceptions. Farmers were aware about SBPs such as land levelling, AWD method, treatment of pre-germinated seeds, effective seedbed preparation, line seeding and

systematic line transplanting but very less practiced. The reasons observed from the participants' response are some practices are not reliable with local conditions such as AWD method in flood prone areas of Mon, Karen and Inn Thar community. However non-flood prone areas of Burmese in Kyaukse and some upland communities are responded not applying AWD method due to high expenditure for both time and money for levelling the rice field. Their further concern was AWD method needed more weed control. Application of some of the SBP consumed more time and labor. They even know the yields resulted from SBP are higher than yields by traditional methods. However, the price and market fluctuation at the time of harvest made less profit so that the net benefit was almost like traditional farmers due to spending high cost of agricultural inputs. The study noted that the farmers have no intention to apply these practices until securing market and good market price for the crop.

Another concern about SBP noted was perception such as treating rice seed with salt solution results to lower seed germination. This perception was well rooted among farmers from all communities except in Inn Thar who is the only one community applied most BSP in rice cultivation. The reason observed is farmers in Inn Thar community received more exposure and familiar to sustainable practices not only from trainings but also from practical themselves as establishing demonstration plots.

As above reasons, the study thus noted that not only technology and capacity support but also financial support as well as creating reliable market and price stability can enforce farmers to apply SBP in rice production.

Regarding with labor rights, practices for respecting child labor was followed among communities. However, many communities engaged their children in light tasks for improving their skills during school holidays. Some good management practices are observed very strongly among all communities such as informal farmer networking in community in which farmers not only shared farming experiences, information about market and weather, and good practices but also discuss community labor and irrigation management.

Some practices are still weak to perform such as record keeping observed in Mon, Burmese, Shan and Inn Thar community but not recorded in complete. The crop calendar is systematically created by some farmers in Inn Thar community while the rest communities prepare schedules in their mind and not on the paper. In term of personal prevention equipment, some farmers used the proper personal equipment preventing harmful exposure from chemical utilization but not all farmers among all communities. The innovative way of personal prevention was observed among women from Shan and Inn Thar community where they used gloves and high-necked boots while transplanting in order to prevent occupational accidents.

4.6.2 Potential impacts of SBP on workload

While assessing the workload as an overall image described in Table 111, the study observed transplanting is the most women dominated activity. Besides transplanting, pre-transplanting tasks (nursery establishment, pulling off and transport seedlings and post-transplanting tasks (gap filling, hand weeding and snail control) also required women’s work. In harvest and post-harvest activities where farm machinery substitutes human labor, women involvement is relatively lower than when those activities were done manually. Mon, Karen, Taung Yoe and some Burmese community are still doing manual harvesting where women

takes the key role. However, other communities where mechanized harvesting is carried out, the young workforce plays as a key contributor while women involve as helpers.

If some efficient technology will be widely implemented in transplanting process, it can have negative impacts on women workload and their income as wage labor. For example, if the direct seeding method by using hand seeding machine is done, not only transplanting task but also tasks related to it - pre and post transplanting tasks will be lost.

However, there will still be a lot of potential spaces for women involvement as hand weeding in the field. Farmers preferred to remove weeds manually as it is effective when seedlings are young. If line seeding and AWD methods are introduced, women have more opportunity for hand weeding as these methods requires more weed control. If the farm machineries are made more women-friendly and capacity of women built to operate and maintain different farm machineries, it can help reduce their drudgery.

Table 11 Summary of women workload distribution in rice production

Rice production steps	Average Women Workload (%)
Nursery plot preparation	12
burning rice stubble	3
weed and debris removal	18
transport seedlings	10
pull of seedlings	14
transplanting	90
gap filling	38
inbound water management	6
snail control (manual)	12
pesticide application	4
fertilizer application	4
weeding	32
combined harvester	4
harvesting	28
rice shafe bundling	19
sun-drying	17
prepare threshing ground	16
rice shaves mound	14
threshing (cattle)	2
threshing (thresher)	13
winnowing (blower)	9
remove & collect straw	3
stir grains for well dry	8
collect and pack grains	30
transport (men & tractor)	10
storage	13

4.7 Interventions to increase gender and social equity

The actions could be grouped into two: creating alternative income opportunities by removing structural barriers and time saving of women by changing cultural barriers.

4.7.1 Create alternative income opportunities

Distribution of workload in traditional rice farming – As discussed in the rice cultivation practices and gender workload distribution among project targeted areas, women could share about 20 or 30% workload in the tasks of seed germination, fertilizer application, seed

sprouting, etc., According to respondents who are sharing those workloads, it does not mean that women are not capable to do those tasks. Incapability is due to lack of beforehand systematic preparation. Respondents identified that women could not carry heavy seed and fertilizer bag or pesticide bucket. Thus, to advocate women and men to change the size of those things to be portable one is essential. For the seed germination and seed sprouting, separating heavy seed bag into small bags will be useful tips for the other women to be able to carry. Making small seed bags can be also prepared at the harvesting time when the paddy grains were reserved for seeds. In the case of spraying pesticide, carrying fewer amounts in the bucket is required.

To secure spaces for women labor and income from application of SBP – As discussed in impacts of SBP, some tasks resulting from introduction of practices as weeding from direct seeding and AWD, fetching straw from harvester should be provided to women. It is not only to create job opportunities, but also to provide similar daily wages to women as earned for transplanting.

Farm machineries training targeting women / use women-friendly agriculture tools – The study identified three demands from the respondents: to provide training, to use the lighter farm machinery and to change the manual engine starter. Replacing with lighter agricultural machines could expand and ensure the spaces for women and older men who are less strength for longer term. Limitation for this is costly and taking time to make familiar with the new technology again. If replacement of new lighter agricultural machine can be costly, the alternative approach to reduce a barrier should be introduced. Women participation in the trainings should be ensured or the training solely targeted to women should be done to make them familiar with the operation and fixation of the advanced technology. As discussed in the previous section, the challenges for women in using the introduced agricultural machines are due to uneasiness of starting engine while the challenge for men in some places is unfamiliarity of the machine. Thus, a high demand is replacing a mortar engine starter and training for women to get familiar with operation of the machine. This arrangement will be useful for men as well because in some places it is young men who are commonly handling those farm machines.

Training on vocational and life-skill – This should consider opportunities both for men and women because job opportunities of men will gradually be reduced if rice farming is shifted from manual to increase farm machinery-based agriculture. The popular demand was to create similar wage opportunities in or around the villages and to provide skill training particularly on tailoring and making local product based high quality snacks or preserved foods for the women' alternative job opportunities. Encouraging and helping women to develop peculiar local product will be beneficial for the long-term purpose. Instead of introducing totally new idea, value-added on the existing experiences and practices will be more efficient. For example, women in Burmese community from Bilin township mentioned that in the peak season they dry surplus fruit and vegetables and preserve for domestic consumption or selling. They do notice that mass production with a certain technology and package will be valuable and marketable. However, to encourage the products to be distinctive is also important for sustainable development. A choice between whether to keep the equal income opportunity or to increase their livelihood sustainable ways is also important. Thus, it should be bearing in mind that encouraging the similar or very common product will be difficult to profit or to market for the women as it is not distinctive. This

intervention may take time to implement as it needs special attention and further in-depth research.

4.7.2 Actions to reduce women workload

Setting up of community day care centers for child and elders – some of the women identified that they could not work outside especially when there have to look after children and elders. Women spend at least 6 hours a day on housework even if they do other income generating jobs outside. Women lose chances to participate in meeting, training and even to earn money. Setting up community day care centers for children and elder can be a good option. Suggested idea was to take turns with between different households in the community to take care of the children and elders during the day. Working women and men should reserve a small portion of their wages to support the wages of those caregivers in the community center. The women in the village should rotate duties of caregivers once a week. However, this kind of intervention should be considered carefully as it may negatively impact on the traditional nature of family bonding. Traditionally, Myanmar is a country like any other eastern countries where serving and caring among the family members regardless of their financial status.

Encouraging to use efficient kitchen appliances – Another potential way to reduce the workload of women is to encourage in using efficient kitchen appliances which can use parallel such as rice cookers, cooking stoves etc. However, it should be aware the limited government power supply in some study areas and application of limited solar powers.

Changing perception of men and women through capacity building– The inclusion of gender equality mind-set through special talks and training is necessary to break the embedded culture by explaining about the practical issues and beneficial. It can be focusing on equal capabilities of women and men and the current incapability is due to the structural issues which can be reduced and removed. It can be the women income contribution role in the house is equally important as men for the family well-being. The realization of women themselves for their potential is also important to emphasize.

5. Conclusions and Recommendations

The study covered all three agro-ecological zones of Myanmar so that a wider diversity of rice farming practices could be observed among different ethnic communities as well as within the same ethnic groups in different geographical regions. Lowland rice is cultivated as mostly as rainfed monsoon rice and summer rice in areas where irrigation facility is available. Upland rice is practiced by only one community (Taung Yoe) in highland areas. Several factors were noted to determine rice cultivation practices. They include availability of farming resources and technologies, community traditions, agroecological and agro-geographic situations. These farming practices together with community traditions defined workload divisions between men and women. However, the traditional workload division between men and women is changing with farm mechanization and introduction of resource efficient practices.

Women from Mon, Karen, Taung Yoe, Shan, Inn Thar and Burmese are involved in rice production as leading workforce in transplanting rice and in manual harvesting in some communities. Women further contributed more proportions in manual tasks such as hand

weeding, snail collection and debris removal. Women were also observed in helping other heavy tasks and skilled works operated by men throughout rice cultivation process. Thus, it can be concluded that women contribute their efforts to the whole rice production although there is a different weighted workload distribution. There are potentials for women to engage in other heavier and skilled tasks such as operating farm machinery and fertilizer application, where some women are already involved. The division of workload between adult men and young men is observed to vary among communities depending on the use of improved technology and farm machinery which are mainly operated by young men. The contribution and availability of young men labor force depend on the level of migration for other job opportunities from a specific household as well as stronger family ties.

Along with rice production, women contribute to secure household incomes from various sources while also taking care of the family doing all the housework and charity in the community. Other sources of income included secondary crop cultivation, grocery, livestock and even as a migrant worker. These earnings supported the family's livelihoods and enhanced their confidence and dignity. Although there is sometimes verbal quarrel within the family, all the respondents reported to feel safe at both home and working in the rice field due to community tradition of caring each other as family members.

Although there are some occupational health problems, agriculture is the key that supports income and job opportunities at the local level. The gradual shift in farm mechanization, introduction of resource efficient technology and farming practices, for example use of combined harvesters instead of manual harvesting is changing the traditional role and workload of women in rice farming. While on the one-hand this reduces the workload, on the other hand it also reduces the job opportunities for women in rice cultivation. It is therefore also essential to ensure women gets work and income for their livelihood and dignity while upgrading the rice production with introduction of sustainable best practices.

To increase and support gender equity in rice production, following recommendations are made.

Recommendation – 1: Choice of targeted areas and types of trainings - Among the nine study townships, this study categories these areas into two groups based on the importance of rice farming as primary or secondary sources of livelihoods.

Group A: In Kyeikmaraw (Mon), Paung (Burmese), Thaton (Karen) and Bilin (Burmese) townships of Mon State, rice farming is the primary income and job opportunity. Rice is produced either in one or two seasons and there is scarcity of other income opportunities in or around the village with many households relying on remittances send by the migrating family members. Involvement of women in rice farming in these areas have a huge impact on the livelihoods, self-confident and dignity. Training on use and maintenance of farm machinery and vocational skills including gender concept are required for women and men in Kyeikmaraw, Paung, Thaton and Bilin. However, careful selection on types of vocational and life-skills training should be considered due to diverse availability of crops and fruit.

Group B: In Kawa (Burmese), Kyaukse (Burmese), Kalaw (Taung Yoe), Nyaung Shwe (Inn Tha) and Lawkswak (Shan), along with rice, the participating households also have other sources of income. Being located near the industrial zones and higher production of cash crops provide alternate sources of income opportunities for women. Thus, in these areas

providing vocational and life-skill trainings may not be the priority. What should be considered is how to maintain or provide existing spaces for women involving in the current farming practices. Though they have other income opportunities in other cropping season, they rely on rice farming for their livelihoods. The training on application of advanced technology in the farm including the operation and maintenance of farm machineries should target and ensure participation of women. Though, life-skills training is not urgent, the choice between agricultural technology training or life-skills training should be the decision of women in the area themselves through well-informed about impacts of new farming method or technologies.

Recommendation 2: Right based-approaches to select rice or other alternate livelihoods: - project should select the approach which is practical and efficient by adopting short-term and long-term plans for gender equality in terms of either participation in the rice value chain or other means of livelihoods. This should be done through public consultation with participation of the target groups ensuring women participation, in all project areas. The study recommends implementing actions on removing some structural barriers systematically and providing required knowledge. Identification and implementation of alternative income generation opportunities based on each locality should start with a long-term vision together with other common interested partners.

Recommendation 3: Further in-depth analysis to find out the suitable and sustainable income generating job opportunities should be done by focusing on potential markets and accessibility to those markets. By bearing in mind the vulnerable position of four study sites in Mon as recommended in recommendation (1), in-depth research should be prioritized in that area.

Recommendation 4: Cooperation with other stakeholders will be beneficial for the capacity building trainings on vocational and life-skills as well as awareness raising on “gender equality”. Life-skill trainings should be done together with regional level women empowerment organization focusing on business. The knowing of local context, experiences and good practices by those organizations will be fruitful. When sharing the concept of gender equality, it should emphasize on the role of women in rice value chain, important of income contribution to the family livelihood and sharing housekeeping responsibilities can increase women participation in paid job particularly in Mon and Shan community where decision is mainly done by men in the rice farming sector and where women participation in the income generating is not important.

Recommendation 5: The project and its partners should understand the importance of gender equity to ensure the participation of women equally with men in all the knowledge sharing events. The project should systematically monitor the participation or men and women in the rice farming to identify whether its increasing or decreasing.

Recommendation 6: Advocacy to the relevant government institutions and farm machinery importers or local producers, if any, to take into account gender perspective in the policy and to consider the application and importation of women-friendly agricultural machine in the future.

6. Annex

Annex I. Questionnaires for Focus Group Discussion (FGD)

1. General Information

1.1 Name of the participant (optional)								
1.2 Village								
1.3 Township								
1.4 Ethnicity								
1.5 Family size	1	2	3	4	5	6	7	above
1.6 Housing type	- Thatched roof, bamboo house							
	- Wooden house (1 story, 2 story)							
	- Concrete and wood (1 story, 2 story)							
	- Others (describe)							
1.7 Assets	- TV							
	- Radio							
	- Mobile phones							
	- Cow ( ), buffalo ( )							
	- bicycle							
	- Motorbikes							
	- 3 wheels tractor							
	- Others							
1.8 Electricity	- Government supply							
	- Community-based supply							
	- Private (generator)							
	- Others							
1.9 Water supply for Domestic use	- Well (private, common)							
	- Stream, communal pond, reservoirs							
	- Others							
1.10 Education	- Head of the family - Never attended school - Primary (Grade –) - Secondary (Grade -) - High school (Grade-) - Graduate/Post-graduate - Others							
	- Wife/ Husband - Never attended school, - Primary (Grade -) - Secondary (Grade-) - High school (Grade-) - Graduate, post-graduate - Others							
	- Present schooling attending family numbers Boy – Girl -							

	- School drop-out numbers Boy : Girl : Reason:	
1.11 Health care access	- Hospital	
	- Sub-rural health centre	
	- Private health-care service (Doctor/ Nurses/ Mid-wife)	
	- Others	
1.12 Number of family member as migrant workers outside village	- (0) , (1) , (2), (3)	
1.13 Decision maker for family economy and social welfare	**Economy**	**Social Welfare**
	- Husband Alone - Wife Alone - Husband & Wife - Family consultation - Others	- Husband Alone - Wife Alone - Husband & Wife - Family consultation - Others
1.14 Legal/ Traditional status of access to assets and property		

2. Economic status

2.1 Monthly income	
2.2 Household's primary livelihood	
(a) Primary livelihood income (% of total monthly income)	
(b) Sources of income	- Rice farming - Seasonal crops farming - Fishing - Livestock rearing - Others
2.3 Secondary livelihoods:	
(a) Secondary livelihood income (% of total monthly income)	
(b) Sources of income	
2.4 Paddy field (acres)	
2.5 Livestock (kind of animals and quantity)	Cow ( )
	Buffalo ( )
	Pig ( )
	Chicken ( )
	Duck ( )
	Others
2.6 Person supporting main income for family	
2.7 Task division	
(a) Men's job for income:	
(b) Women's job for income:	

(c) Young person (Boy/Girl age>15 and <20 years old) job for income	
(d) Child labor (Boy/ Girl less than 15 years old)	
2.8 Remittance from family members outside as migrant workers (% of total monthly income)	

3. Status of Women

3.1	Cultural and value on women
	(a) What are the norms and values regarding women's roles and responsibilities? (b) What are perceptions and values regarding women's economic contributions?
3.2	Women's activities involved in every nodes of rice value change:
	(a) How many hours per day women spent for each activity in rice value change? (b) How much paid for women for these activities?
3.3	Apart from rice cultivation,
	What any other earning activities women engaged in for the family income? How long they spent hours per day? How much they earned?
3.4	How many hour women do domestic works in a day and specify types of tasks? Who shares or do men share this domestic works with you?
3.5	Any other unpaid works women performed in the community? How long they spent for unpaid works in a day?
3.6	Any health problems to women related to their works in rice cultivation?
3.7	Have your community been any young girl and boy who could not attend school because of working in rice cultivation?
3.8	In your village or your neighbor, do you think women are experiencing domestic violence frequently? How do they manage it?
3.9	Have you observed any violence or harassment upon women and young girl in their work? How they manage it?
3.10	How much rice farming is important for women in term of their income and job opportunity?
3.11	If no more space for women in rice farming due to improved farming practices, any other job opportunities for them? Any solutions for women for their income?
3.12	Further possible measures for empowering women?

Annex 2. Checklist of questionnaires for Key Informant Interview

1.	General overview of interviewee	
	(a) Name of the interviewee (optional):	
	(b) Village Name:	
	(c) Township:	
	(d) occupation	
	(e) gender	
	(f) age	

2. What are the activities women engaged in rice value chain?
3. The reasons they engaged to these activities in rice value chain (their importance for these specific tasks)?
4. What kind of improved resource-efficient practices are introduced in which nodes of rice value chain?
5. What are the benefits of these practices in general?
6. What are the further impacts of introducing these practices to women tasks in rice value chain?
7. Any potential opportunities of jobs and income generation for both women and young person from these practices?
8. If no more space due to introducing improved practices, what remedial measures for women should be brought?
9. Apart from rice cultivation, any other income generating jobs for women in your community?