Food and Agriculture Organization of the United Nations

www.theGEF.org

# Assessment on Home Gardening Program as a response to COVID-19 in SLM Project's Pilot Townships

January 2021

Sustainable cropland and forest management in priority agro-ecosystems of Myanmar

## About the assessment

The Food and Agriculture Organization of the United Nations (FAO) is working closely with Department of Planning of Ministry of Agriculture, Livestock and Irrigation (MoALI) in order to implement the Section 2.1.7 of the COVID-19 Economic Relief Plan (CERP) by supporting farmers, small agricultural processors, seed farmers and agriculture businesses.

In order to support the CERP implementation plan, the project, in collaboration with respective Department of Agriculture (DoA) office in pilot Townships, distributed five types of vegetable seeds in Delta (i.e. watercress, eggplant, long bean, okra, roselle) and five type of vegetables in CDZ (i.e. eggplant, long bean, okra, roselle, cucumber), watering can and pamphlets on home gardening to rural farmers in five pilot townships starting from June 2020. The goals of the home gardening programme were to improve food access, nutrition and food security of rural farmers during the COVID-19 pandemic.

## Highlights

- 240 farmers harvested a total of 10 389 Kilograms of vegetables and generated 4 641 600 Kyats as income over June – December 2020 period.
- Water accessibility, diseases/insects/pests and effects of climate change including flood and drought were described as main challenges.
- Household consumption of fresh vegetables and income generation by selling of surplus vegetables were two major benefits of this initiative.
- Overall, 85 percent of household consumed at least 6 out of 12 food groups in all townships. Among them, 99 percent of household consumed vegetables in the last 24-hour.
- Overall, 52 percent of women (15-49 year) achieved minimum dietary diversity by consuming at least 5 out of 10 food groups in all townships.

## Summary

The report provides an analysis and evaluation of the home gardening program implemented by the "Sustainable cropland and forest management in priority agro-ecosystems of Myanmar" (the SLM) project. Home gardening supports were provided to **1 899** farming households before the Monsoon season. The data collection was done from 1 to 18 December 2020 when majority of farmers have had harvested their vegetables.

The findings of the assessment include the total quantity of fresh vegetables harvested and consumed by household, quantity sold and income earned, issues and challenges of home gardening program, typical dietary diversity status of both household and women of reproductive age from rural agriculture-based communities.

## Objectives of the survey

This assessment has two main objectives. They are:

1) To identify quantity of consumption of fresh vegetables, quantity sold, income earned and issues and challenges of home gardening program.
2) To assess "Household Dietary Diversity Score" (HDDS) and "Minimum Dietary Diversity of Women of Reproductive Age Women" (MDD-W) of rural agriculture household receiving home gardening package.

## Study Area and Population

The study was conducted in two priority agro-ecological zones of Myanmar. The home gardening packages were distributed to **1 899** rural households – **1 276** in Labutta, Delta Region and **200** in Nyaung-U and **423** in Kyaukpadaung townships in Central Dry Zone through June-July 2020. Some selected farmers from those who received home gardening packages were included in the assessment.

## Sampling Method

In light of current COVID19 crisis, face-to-face interview was not a feasible option. Therefore, telephone interview was applied as the data collection method. Participants were selected depending on availability of phone numbers and covered all status of home gardening (good/ average / poor) in terms of yields, consumption and income generation. All adult (age ≥ 18 years) farmers who had received the home gardening package from FAO and harvested their vegetables were considered as eligible for sampling. One of the family members who knows about the home gardening status and handle the food for the household, was interviewed. Additionally, a reproductive age woman from each household was also interviewed to assess minimum dietary diversity.

## Sample Size

A total of **240 rural farmers** from three project townships (Nyaung-U, Kyaukpadaung and Labutta) participated in this assessment. Participants were recruited from each village regardless of gender and population size by convenient sampling. Approximately 4-6 farmers (i.e. at least 10 percent of total with a certain village representation) from each village were interviewed with the considerations of including different geographical locations and ensuring village representations in the sample. The following table shows village wise and gender disaggregated home gardening beneficiaries, together with sample size for the assessment for each township **(Table 1)**.

**Table 1.**

| Township | # of village | No of Beneficiary | | | # of participants | Remark |
|---|---|---|---|---|---|---|
| | | Male | Female | Total | | |
| Kyaukpadaung | 15 | 270 | 153 | 423 | 60 | (~ 4 farmers/ village) |
| NyaungU | 15 | 172 | 28 | 200 | 60 | (~ 4 farmers/ village) |
| Labutta | 20 | 913 | 363 | 1276 | 120 | (~ 6 farmers/ village) |
| **Total** | **50** | **1355** | **544** | **1899** | **240** | |

## Data collection and analysis procedures

The SLM project recruited enumerators who know the local contexts, have strong knowledge on agriculture and speak local languages. Enumerators were trained virtually prior to data collection by SLM team in Nay Pyi Taw through MicrosoftTeams. In order to reduce the potential recall bias, two interviews were conducted. On Day 1 the enumerators called the participants to obtain inform consent, assess the status of their home gardens (good/ average/ poor), explained the questions and asked to take note of all foods and beverages with a minimum of 15 grams consumed by the whole household and by a reproductive age woman in the past 24 hours and made appointment. On Day 2, the enumerators conducted the interviews and filled the answers in the provided tablets.

Structured questionnaire was used to assess home gardening information and the 24-hour dietary recall method was applied to gather comprehensive and detailed information of all meals and snacks consumed.

In addition to that, the SLM Nay Pyi Taw team categorized the collected dietary data into specific food groups – 12 groups in HDDS and 10 groups in MDD-W. HDDW and MDD-W scores were calculated to assess household access to and consumption of diverse food groups.

## Ethical considerations

The Interview guideline was developed in Burmese language to assist the enumerators with the interviews. On Day 1, the objectives of the survey and questions were thoroughly explained to the adult farmers (age ≥ 18 years) and informed verbal consent was taken prior to interview. The participation of farmers was completely voluntary and any incentive in-kind or in-cash was not provided. Farmers were also allowed to ask questions before, during and after the survey and skip question if they do not want to answer and quit the assessment at any time during the interview.

Collected data were automatically saved in a central server, and the stored data relating to household identification number and participant's village name or any information that could identify the participant were only accessible to the Nay Pyi Taw survey team and were not mentioned in any report disseminated to the public.

## Key Findings

In this survey, a total of 60, 60 and 120 farmers from Kyaukpadaung, Nyaung-U and Labutta respectively were interviewed. Almost all participating farmers in Kyaukpadaung and Nyaung-U planted five types of distributed seeds. However, only 86 percent of interviewees in Labutta had planted all type of distributed seeds during the data collection period. The following table shows township wise vegetable planted information in percentages **(Table 2)**.

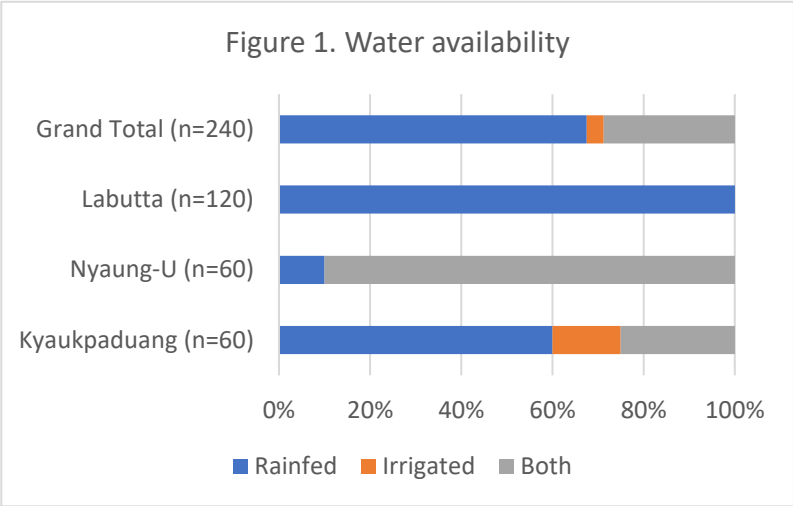
**Table 2. Proportion of Planted Vegetables by Township**

| | Watercress | Cucumber | Long bean | Okra | Roselle | Eggplant |
|---|---|---|---|---|---|---|
| Kyaukpadaung | - | 100% (60/60) | 98% (59/60) | 100% (60/60) | 100% (60/60) | 95% (57/60) |
| Nyaung-U | - | 98% (59/60) | 100% (60/60) | 100% (60/60) | 100% (60/60) | 100% (60/60) |
| Labutta | 86% (103/120) | - | 100% (120/120) | 83% (113/120) | 93% (112/120) | 71% (85/120) |

The rural agriculture-based families residing in **45** villages in two agro-ecological zones grew vegetables in home gardens during June to December 2020. The average family size is 4.7 and population size is 1007 in three study townships. Overall, the average family size and population size of participating townships are shown in **Table 3**.

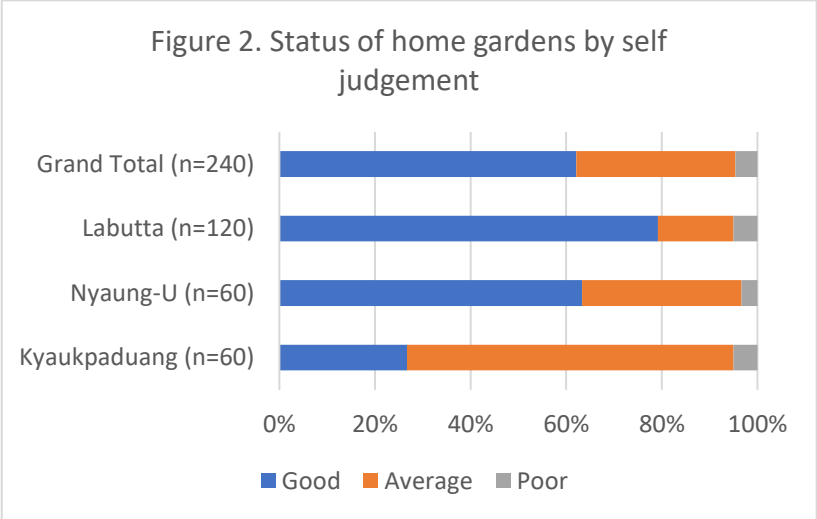
**Table 3. Average Family and Population Sizes of Survey Villages**

| | Kyaukpadaung | Nyaung-U | Labutta | Grand Total |
|---|---|---|---|---|
| Family Size | 5.1 (n=60) | 5.2 (n=60) | 4.3 (n=60) | 4.7 (n=240) |
| Population Size | 988 (n=15) | 967 (n=15) | 1037 (n=20) | 1007 (n=45) |



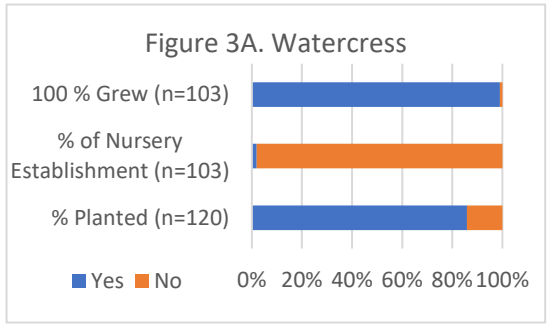

100 percent of the farmers in Labutta have to rely on rainfall to grow vegetables. In central dry zone, the water accessibility in Nyaung-U and Kyaukpadaung was either rainfall or irrigation or both in some cases **(Figure 1)**. Overall, 68 percent of farmer's vegetable gardens totally depended on rain.

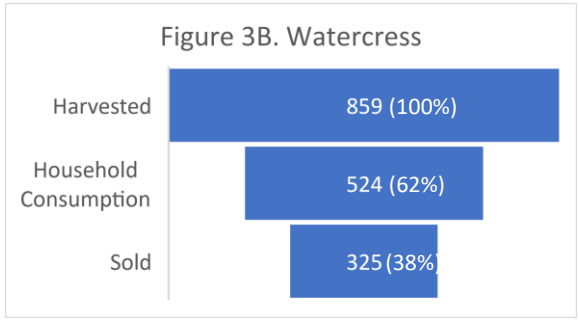
Overall, famers reported the status of their home gardens as Good (62 percent), Average (33 percent) and Bad (5 percent). In contrast, 68 percent of farmers in Kyaukpadaung reported the status as average **(Figure 2)**.



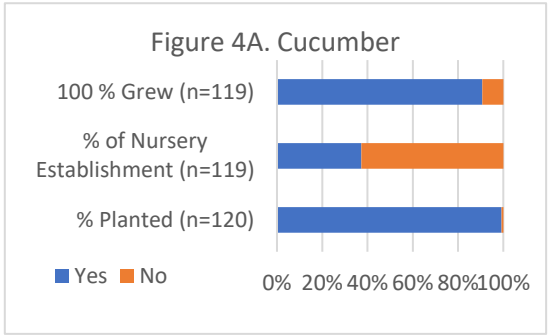
The following charts on the left describe the proportions of planted, nursery establishment and 100 percent distributed seeds grew up to December disaggregated by each type of vegetable. The charts on the right describe the amount of total harvested – divided into household consumption and amount sold in Kilograms (Kg) for each type of vegetable. The sold amount has generated income for each vegetable and the income are also showed in Myanmar Kyat (MMK) (Figure 3 to 8).

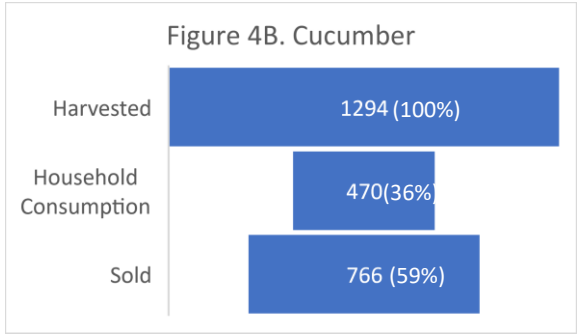
Kazun Ywet



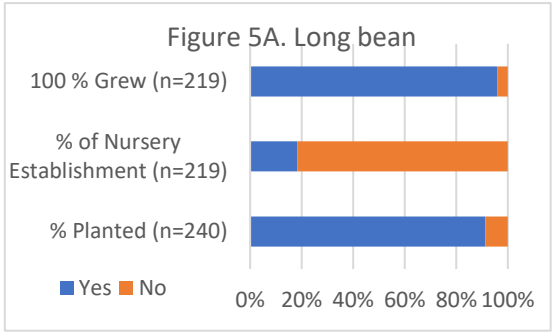



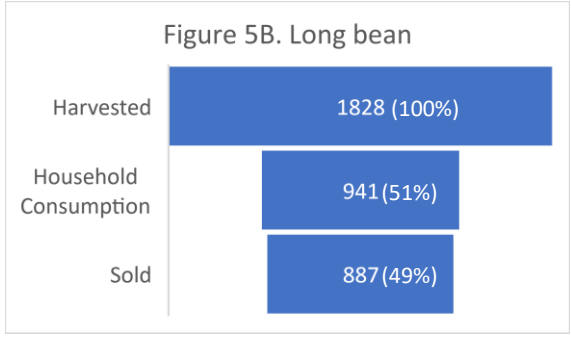

| | |
|---|---|
| Total income generated | 432,000 MMK |
| Average income per household | 4,194 MMK |
| Average consumption per household | 5.1 Kg |



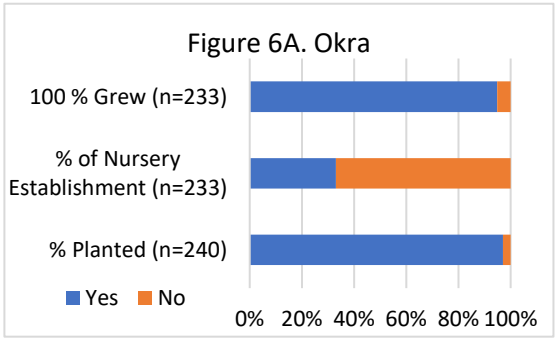



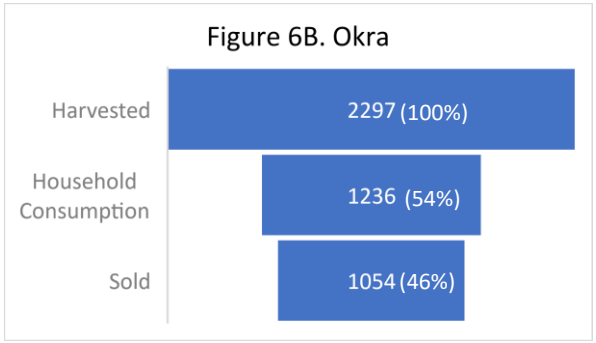

| | |
|---|---|
| Total income generated | 412,800 MMK |
| Average income per household | 3,469 MMK |
| Average consumption per household | 3.9 Kg |



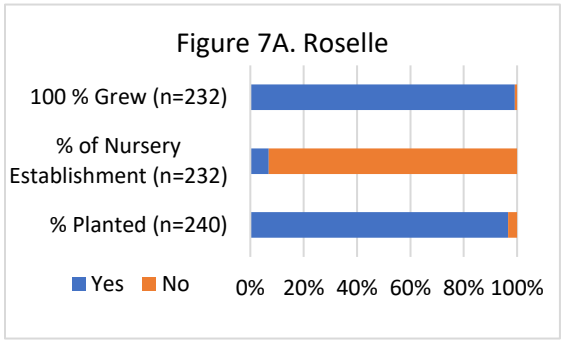



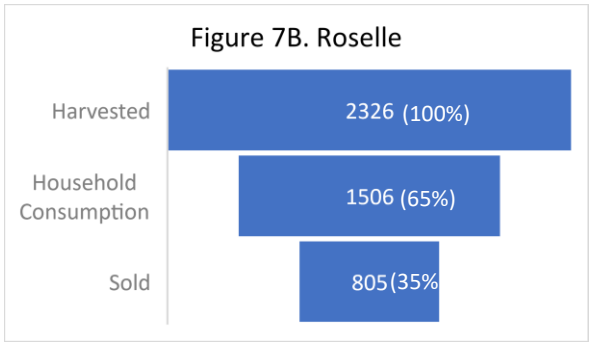

| | |
|---|---|
| Total income generated | 912,400 MMK |
| Average income per household | 4,166 MMK |
| Average consumption per household | 4.3 Kg |



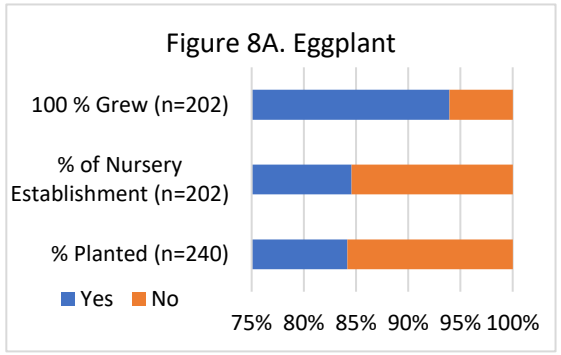



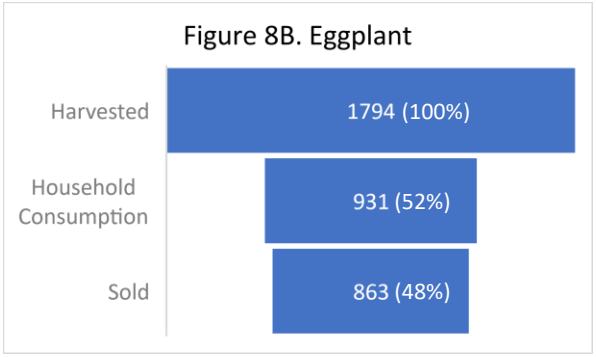

| | |
|---|---|
| Total income generated | 1,076,800 MMK |
| Average income per household | 4,621 MMK |
| Average consumption per household | 5.3 Kg |




| | |
|---|---|
| Total income generated | 1,119,000 MMK |
| Average income per household | 4,823 MMK |
| Average consumption per household | 6.5 Kg |




| | |
|---|---|
| Total income generated | 688,600 MMK |
| Average income per household | 3,408 MMK |
| Average consumption per household | 4.6 Kg |

To summarize, a total of 10,398 Kg of vegetables were harvested by the 240 farmers, in which 5 608 Kg were consumed by household members and 4 700 were sold to market making over 4.64 million kyats[1] as extra income during June to December 2020 **(Table 4)**.

**Table 4. Total Yields and Income Generation of Home Gardening Program**

| Total of | For all Veggie (in Kg) | Generated Income (in MMK) |
|---|---|---|
| Harvested | 10,398 (100%)[2] | - |
| Household Consumption | 5,608 (54%) | - |
| Sold | 4,700 (45%) | 4,641,600 |

The average consumption per household in Kilograms and average income per household in Kyats with minimum and maximum income per household in bracket for each type of vegetable are shown in **Table 5**. The average consumption is ranging from 3.9 Kg to 6.5 Kg. Similarly, the average income of participating household ranges from 3 408 to 4 823 Kyats. The income generated by selling surplus vegetables significantly varied depending on weather (drought and flood), participants' previous experiences of growing home gardens, lost due to pests/insects in early stage and water accessibility.

**Table 5. Average Consumption and Income per Household by Type of Vegetable**

| Sr. No | Type of Vegetable | Average consumption in Kg per household | Average income in MMK per household (Min: Max) |
|---|---|---|---|
| 1 | Watercress (n=130) | 5.1 | 4,194 (2,000:85,000) |
| 2 | Cucumber (n=119) | 3.9 | 3,469 (1,000:75,000) |
| 3 | Long bean (n=219) | 4.3 | 4,166 (2,000:40,000) |
| 4 | Okra (n=233) | 5.3 | 4,621 (2,000:80,000) |
| 5 | Roselle (n=232) | 6.5 | 4,823 (2,000:50,000) |
| 6 | Eggplant (n=202) | 4.6 | 3,408 (1,000:60,000) |

[1] The income generated by selling the yields may vary from vegetable to vegetable, from township to township, seasonality and market demand due to COVID-19 restrictions

[2] The summation of household consumption and quantity sold is not the same as total quantity of harvested vegetables. Estimated 1% (90Kg) of vegetables were lost due to pest/insects and inedible vegetables, for instance, farmer threw bitter cucumbers away.

The interviewing households were asked to assess their primary sources of food. 100 percent of household described “own production, gathering, hunting and fishing” as their primary source of food and vegetables. The proportion of vegetables purchased for household consumption ranging from 100 percent (Nyaung-U), 95 percent (Labutta), to 83 percent (Labutta). Types of vegetable purchased were not quantify in this study.

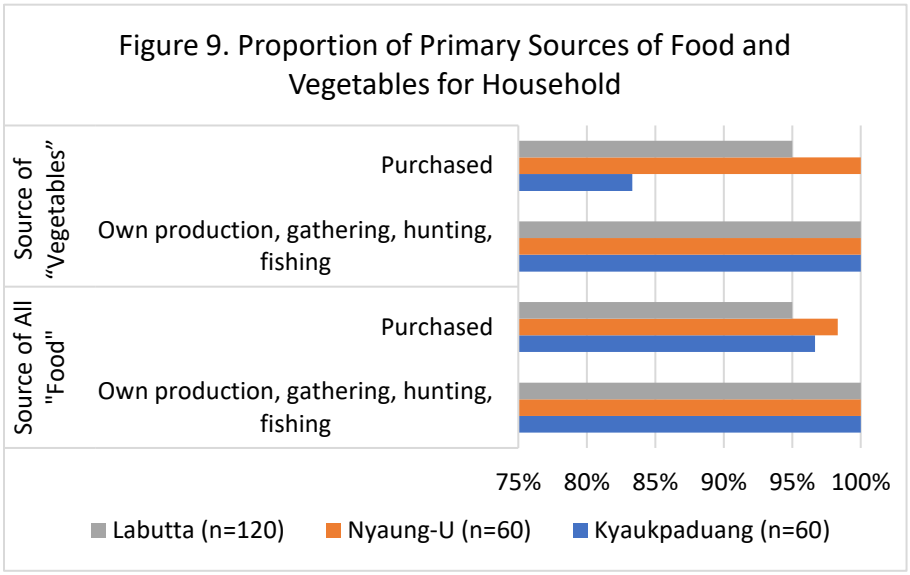


Figure 9. Proportion of Primary Sources of Food and Vegetables for Household

Overall, the two major sources of households for “all types of food” and “vegetables” are as follows **(Figure 9)**.

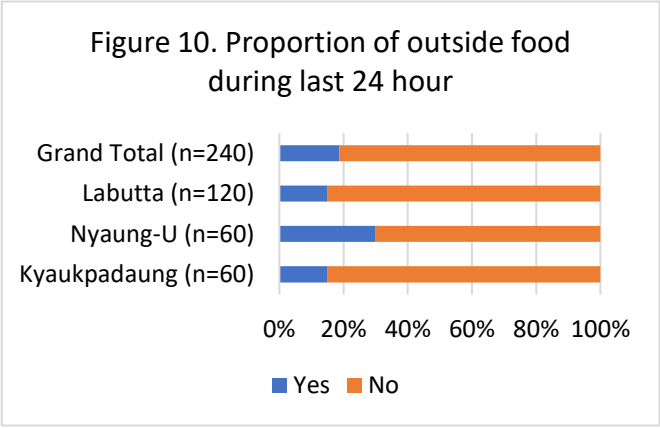
In this survey, 240 households were asked to list all types of foods and beverages consumed in the last 24-hour to calculate HDDS and MDD-W. Since the main purpose of this survey is to evaluate the home gardening program, the detail socio-economic data such as household expenditure, education, employment and wealth data were not collected as part of survey. The household diversity score was calculated based on 12 food groups as follows **(Table 6)**.

**Table 6. Aggregation of food groups to calculate HDDS**[3]

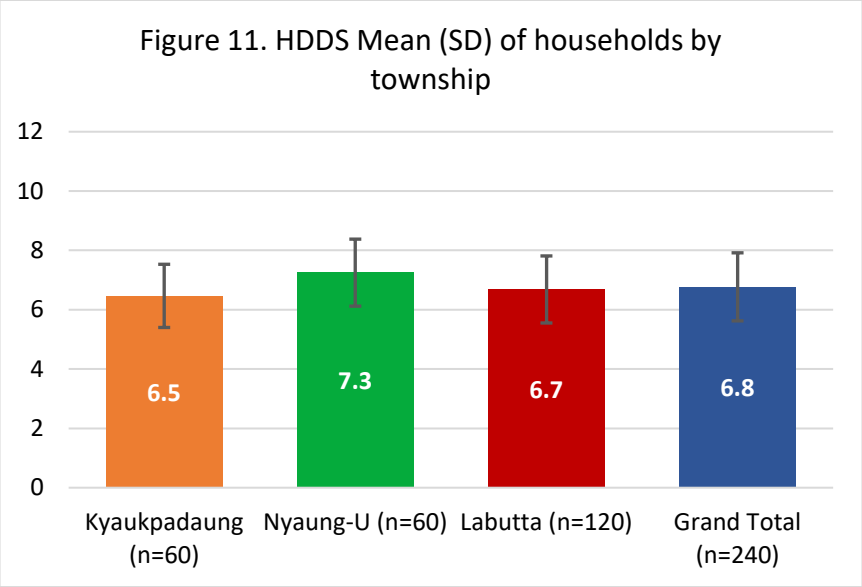
| Question number(s) | Food group |
|---|---|
| 1 | Cereals |
| 2 | White tubers and roots |
| 3,4,5 | Vegetables[a] |
| 6,7 | Fruits[b] |
| 8,9 | Meat[c] |
| 10 | Eggs |
| 11 | Fish and other seafood |
| 12 | Legumes, nuts and seeds |
| 13 | Milk and milk products |
| 14 | Oils and fats |
| 15 | Sweets |
| 16 | Spices, condiments and beverages |

a) The vegetable food group is a combination of vitamin A rich vegetables and tubers, dark green leafy vegetables and other vegetables.
b) The fruit group is a combination of vitamin A rich fruits and other fruits.
c) The meat group is a combination of organ meat and flesh meat.

Overall, only 19 percent (n=45) of household consumed outside food during the last 24 hr **(Figure 10)**. There was no significant different in HDDS between those who ate outside food in the past 24-hour and who did not.




[3] The HDDS calculation was based on "Guidelines for Measuring Household and Individual Dietary Diversity" by Nutrition and Consumer Protection Division, Food and Agriculture Organization of the United Nations




The mean of HDDS in all townships are 6.8 (SD ± 1.1). The score ranges from 4 (minimum) to 10 (maximum) in all study households. However, the mean scores are quite similar in all townships. The number of food groups consumed in last 24-hour by township are shown in **Figure 11**. Overall, 85 percent of household consumed at least six food groups in all townships. The study found statistical difference between Kyaukpadaung and Nyaung-U (P=<0.001) and between Nyaung-U and Labutta (P=<0.01).

**Table 7. Proportion of Household Consumption of Each Food Group in Last 24-Hour by Township**

| Percentage of Households Consuming | Kyaukpadaung (n=60) | Nyaung-U (n=60) | Labutta (n=120) | Total (n=240) |
|---|---|---|---|---|
| Cereals | 100% | 100% | 100% | 100% |
| Oils and fats | 100% | 100% | 100% | 100% |
| Spices, condiments and beverages | 100% | 100% | 100% | 100% |
| Vegetables | 100% | 100% | 98% | 99% |
| Fish and other seafood | 58% | 55% | 88% | 73% |
| Legumes, nuts and seeds | 60% | 92% | 38% | 57% |
| Meat | 57% | 45% | 31% | 41% |
| Sweets | 13% | 63% | 34% | 36% |
| Fruits | 32% | 45% | 28% | 33% |
| Eggs | 23% | 12% | 36% | 27% |
| White tubers and roots | 3% | 7% | 9% | 7% |
| Milk and milk products | 0% | 7% | 6% | 5% |

The proportion of household that consumed each food group in the last 24-hour by township are elaborated in **Table 7**. Regarding the HDDS, almost all farmers consumed cereals (100 percent), oils and fats (100 percent), spices, condiments and beverages (100 percent) and vegetables (99 percent) yesterday. The consumption of fish and other seafood is the highest in Labutta (88 percent) where availability and accessibility of those type of food groups are higher. Similarly, the consumption of legumes, nuts and seeds is the higher in Nyaung-U (92 percent) and

Kyaukpadaung (60 percent) where groundnuts and sesames were grown as main crops than Labutta (38 percent). On average, around 41 percent of households ate meat in the last 24-hour. The proportion of household consuming "white tubers and roots" (7 percent) and "milk and milk products" (5 percent) is very low in all study townships. In general, only 41 percent of household were able to consume meat. The consumption of "Sweet" is highest in Nyaung-U since majority of farmers ate jaggery as their daily snack after heavy meals. Overall, "Fruit" consumption is only 33 percent and Labutta has the lowest percentage (28 percent) among other townships. In summary, the consumption of meat, sweets, eggs, white tubers and roots and dairy products was ranging from 5 percent to 41 percent only.

The study also collected data to assess dietary diversity of women (15-49 years) in all township. The MDD-W has been validated and globally accepted as an indicator to examine the probability of micronutrient adequacy among women of reproductive age. The calculation of MDD-W is based on 10 food groups[4] as follows **(Table 8)**.

**Table 8. Aggregation to construct Minimum Dietary Diversity for Women of Reproductive Age (MDD-W)**

| Groups/items/rows on model questionnaire | 10 food groups in MDD-W |
|---|---|
| A. Foods made from grains | 1. Grains, white roots and tubers, and plantains |
| B. White roots and tubers and plantains | |
| C. Pulses (beans, peas and lentils) | 2. Pulses (beans, peas and lentils) |
| D. Nuts and seeds | 3. Nuts and seeds |
| E. Milk and milk products | 4. Dairy |
| F. Organ meat | 5. Meat, poultry and fish |
| G. Meat and poultry | |
| H. Fish and seafood | |
| I. Eggs | 6. Eggs |
| J. Dark green leafy vegetables | 7. Dark green leafy vegetables |
| K. Vitamin A-rich vegetables, roots and tubers | 8. Other vitamin A-rich fruits and vegetables |
| L. Vitamin A-rich fruits | |
| M. Other vegetables | 9. Other vegetables |
| N. Other fruits | 10. Other fruits |

[4] The reference for the measurement of MDD-W based on "Minimum Dietary Diversity for Women: A Guide to Measurement" by the Food and Agriculture Organization of the United Nations and USAID's Food and Nutrition Technical Assistance III Project (FANTA), managed by FHI 360, 2016

In this survey, a total of 187 women from three townships were interviewed. Township wise proportion of reproductive age women who had consumed each food group in the last 24-hour are described in **Annex 1**. The MDD-W is measured to assess overall nutrient adequacy and dietary diversity. Overall, 52 percent of women (15-49 year) consuming at least five out of ten food groups achieved the minimum dietary diversity **Figure 12A**. The percentages of achieving MDD-W for Nyaung-U (76 percent), Kyaukpadaung (56 percent) and Labutta (38 percent) are shown in the **Figure 12A**. Contrastingly, 62 percent of women in Labutta did not meet the minimum dietary diversity standard. According to LIFT household survey 2017, the percent of women achieving MDD-W in Central Dry Zone (50 percent) and Delta region (30 percent) were lower than the findings in this SLM survey (1). The home gardening program may contribute to increasing the diversification of food groups, particularly in the consumption of "other vegetables" and "dark green leafy vegetables" groups. However, in-depth study is needed to examine the causality and associations. Regarding MDD-W, the number of food groups yesterday for Nyaung-U (5.3±1.2), Kyaukpadaung (4.6±1.0) and Laubtta (4.2±1.1) are also shown in **Figure 12B**.

Figure 12 A. Percent of women (15-49 years) achieving MDD-W by townships (>=5 food groups yesterday)

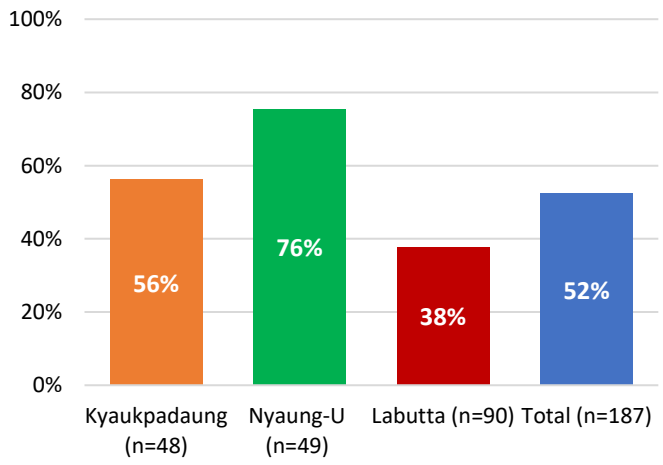
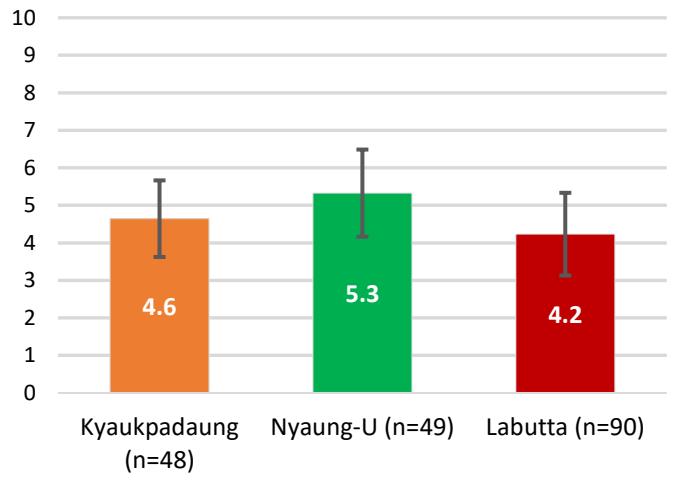
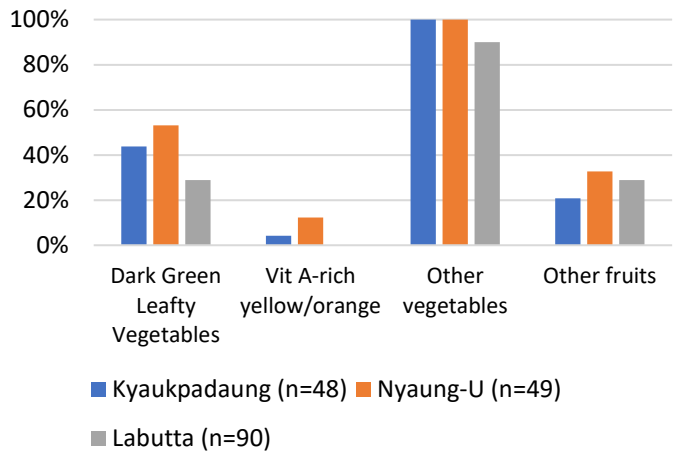



Figure 12 B. Mean dietary diversity score of women (15-49 years) by township



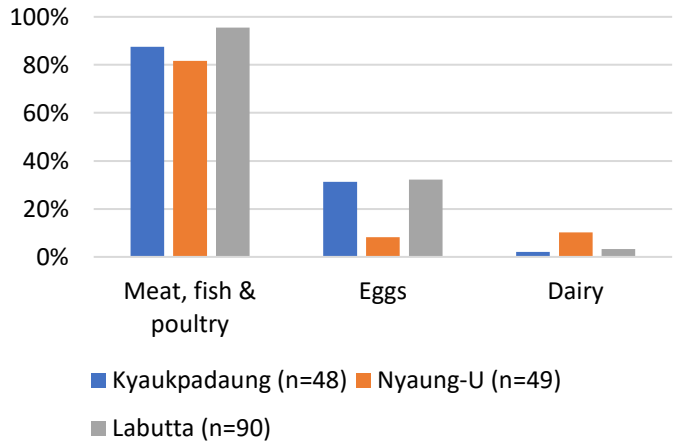

The consumption of 10 food groups were categorised into fruits and vegetables, animal-source foods and pulses, nuts and seeds to examine the consumption patterns of those food groups **(Figure 13 to 15)**.

Figure 13. Fruits and vegetables (MDD-W)



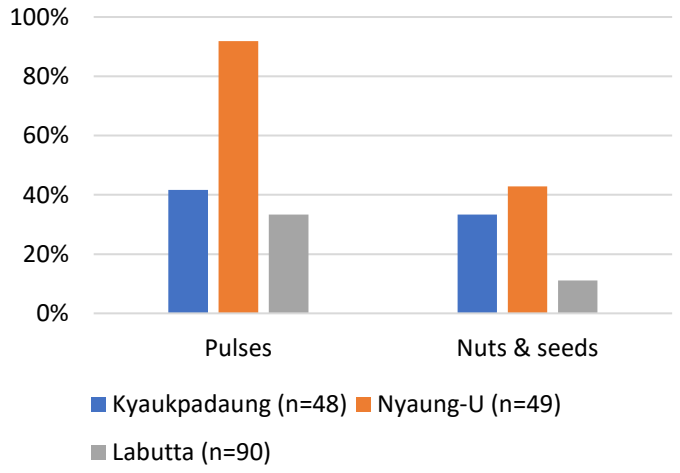

The fruits and vegetables consumption by each township are shown in **Figure 13**. Despite consumption of other vegetables was closed to 100 percent, the proportion of Vit A-rich fruits and vegetables is as low as zero percent in Labutta. On average, 39 percent ate "Dark green leafy vegetables" and 28 percent ate "other fruits" in all study townships. The study result indicates the important role the providing vitamin A supplements to reproductive age women as a compensation because of lower consumptions.

Figure 14. MDD-W Animal-source foods




Township wise consumption of animal source foods is showed in **Figure 14**. Flesh meat, fish and poultry consumption is above 80 percent in all townships. However, the dairy consumption is very low. On average, 26 percent of women ate "Eggs." But Only 8 percent of women in Nyaung-U ate "Eggs." The main source of protein for women came from meat, fish and poultry.

Figure 15. MDD-W Pulses, nuts & seeds




The **Figure 15** shows the consumption of pulses, nuts and seeds by women of reproductive age in study townships. The consumption of both food groups is higher in Nyaung-U (92 percent) than the rest two townships – Kyaukpadaung (42 percent) and Labutta (33 percent). Similarly, the nuts and seeds consumption of Nyaung-U's women participants was (43 percent) whilst those of Kaukpadaung and Labutta were 33 percent and 11 percent respectively.

## Conclusion

- The distribution of home gardening packages which included seeds, pamphlets and watering cans, during the monsoon cropping season contributed to successful planting and harvesting of the vegetables.
- The home gardening programme certainly helped the rural households to save money by producing their own and generating some income by selling the surplus vegetables.
- The vegetables consumption likely to increase in future once a greater number of farmers start/continue growing fresh vegetables in their home garden or even in the expanded areas by learning from home gardening program implemented by the project.
- Overall, the home gardening program helped the communities in rural area to improve food access, food security and nutrition by producing fresh vegetables in their own gardens during the time of COVID-19 pandemic.
- The findings related to HDDS and MDD-W will be useful to serve as baseline data for further dietary quality studies.

## About FAO SLM project

The “Sustainable cropland and forest management in priority agro-ecosystems of Myanmar (SLM)” project is a five-year project implemented with the financial support of Global Environment Facility (GEF) and has been promoting the climate smart agriculture (CSA) and sustainable forest management (SFM) practices in five pilot townships (Mindat, Kanpetlet, Nyaung-U, Kyaukpadaung and Labutta) in three agro-ecological zones (Upland/hills, central dry zone and delta/coastal zone).

The project provides not only policy and regulatory framework support relating to goal of the project but also implements field activities through Farmer Field Schools and community-based forestry management approaches in partnership with two distinct ministries – “Ministry of Agriculture, Livestock and Irrigation” (MOALI) and “Ministry of Natural Resources and Environmental Conservation (MONREC).”

## Annex

**Annex 1. Township wise proportion of reproductive age women who had consumed each food group in the last 24-hour**

| Percentage of Reproductive Age Women Consuming | Kyaukpadaung (n=48) | Nyaung-U (n=49) | Labutta (n=90) | Total (n=187) |
|---|---|---|---|---|
| Grains, white roots and tubers, and plantains | 100% | 100% | 100% | 100% |
| Other vegetables | 100% | 100% | 90% | 95% |
| Meat, poultry and fish | 88% | 82% | 96% | 90% |
| Pulses (beans, peas and lentils) | 42% | 92% | 33% | 51% |
| Dark green leafy vegetables | 44% | 53% | 29% | 39% |
| Other fruits | 21% | 33% | 29% | 28% |
| Eggs | 31% | 8% | 32% | 26% |
| Nuts and seeds | 33% | 43% | 11% | 25% |
| Dairy | 2% | 10% | 3% | 5% |
| Other vitamin A-rich fruits and vegetables | 4% | 12% | 0% | 4% |

## Reference

1. BlÖndal N. Livelihoods and Food Security Fund. [cited 2021 Jan 10];96. Available from: https://www.lift-fund.org/sites/lift-fund.org/files/publication/Household%20Survey10_300519.pdf

Contact
Building no. 39, Forest Department Ministry of Natural Resources and Environmental Conservation Nay Pyi Taw, Myanmar
Phone: 09 423334625
Email: slmmyanmarinfo@gmail.com
Website: www.slmmyanmar.info

Recommended citation: FAO SLM-GEF. 2021. Assessment on Home Gardening Program as a response to COVID-19 in SLM Project's Pilot Townships: Result of Telephone Interview. Nay Pyi Taw.