SECURING POSITIVE NUTRITIONAL OUTCOMES THROUGH AGRICULTURAL EXTENSION, NUTRITION EDUCATION AND INSTITUTION BUILDING IN RURAL CHIN STATE

Assessing the Requirements for Food and Nutrition Security Concept Mapping Research Study

December 2016 - March 2017
MYANMAR

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ASSESSING THE REQUIREMENTS FOR FOOD AND NUTRITION SECURITY
CONCEPT MAPPING RESEARCH STUDY

December 2016-March 2017

Project Area:
Hakha Township, Chin State, Myanmar

Funded by:
Livelihoods and Food Security Trust Fund (LIFT)

Conducted by:
Myanmar Institute for Integrated Development (MIID) in partnership with Cornell University, New York, USA

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Disclaimer

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Acknowledgements

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Executive Summary

Myanmar is self-sufficient in food production but crop production patterns are significantly different from region to region according to the diverse agro-ecological conditions. Generally, in hilly and mountain areas and parts of the central dry zone, crop productivity is lower than that in other regions and thus deficits in staple crops can occur. Myanmar suffers from several different forms of malnutrition and micronutrient deficiencies. According to the 2015-16 Myanmar Demographics and Health Survey, 29% of children under age 5 were stunted, indicating chronic undernourishment, 7% were wasted, indicating acute undernutrition, and 19% were underweight. Stunting among children was highest in Chin State, at 41%, with 13% of children severely stunted. Chin State is one of the poorest states in Myanmar and is struggling to achieve food and nutrition security.

Assessing requirements for food and nutrition security in 24 villages of Hakha Township in Chin State through Concept Mapping methodology is a pilot action research study that is part of a three-year project implemented by the Myanmar Institute for Integrated Development (MIID) in partnership with Cornell University in New York and funded by the Livelihoods and Food Security Trust Fund (LIFT). The main purpose of the project **'Securing Positive Nutritional Outcomes through Agricultural Extension, Nutrition Education and Institution Building in Rural Chin State'** is increasing incomes for rural households and improving the food and nutrition security of the most vulnerable people, particularly women and children in rural Chin communities through providing education and information on nutrition sensitive agriculture, food production and upland farming practices, good nutrition practices including food safety, sanitation and hygienic practices, and the strengthening of local institutions. Nutrition-sensitive agriculture is a food-based approach to agricultural development that puts nutritionally rich foods, dietary diversity, and food fortification at the heart of overcoming malnutrition and micronutrient deficiencies.

For this study we have used a process based on the 'Concept Mapping' methodology. Concept Mapping is a process that allows information to be collected from a variety of stakeholders and to be organized using sophisticated statistical analysis that produces a visual representation that captures common trends. This process combines 'bottom up' participation with rigorous analysis. The senior technical lead researcher from Cornell University and MIID project staff conducted the Concept Mapping research study through face-to-face interviews, focus group discussions and stakeholder workshops with representative groups including farmers, producers, community members, village leaders, midwives, school teachers, village health workers and church leaders from the 24 villages; representatives from government organizations, local and international NGOs, Community-based organizations, Civil Society organizations and UN organizations involved in food and nutrition related projects in Chin State.

The Concept Mapping process requires a focus question 'prompt' that generates a single idea to complete a statement. The prompt used was '***The main causes of people in your area not having enough food are …'.*** This prompt was shared in two ways: firstly during group meetings

with participants where they brainstormed responses; and secondly, through one-on-one interviews that were conducted in different community settings. Together these activities produced 150 statements for Sorting and Ratings at the Concept Mapping workshop. We received high participation from government organizations including Department of Agriculture, Department of Public Health, Department of Education, Department of Rural Development, Government Administration Department, Livestock Breeding and Veterinary Department, National Race and Boarder Affairs Development, Social Development Department, Relief and Resettlement Department, and the Cooperative Department.

We conducted a Concept Mapping workshop with diverse stakeholder groups in Hakha on January 30, and were then able to share the preliminary results with stakeholders at the launch event of MIID-Cornell LIFT funded project held in Hakha City on January 31, 2017. Participants included 48 representatives from the 24 project villages and 26 representatives from different organizations including Department of Agriculture, Department of Public Health, Department of Education, local and international NGOs, CBO, CSO, and UN organizations. Each participant was given a stack of 150 statements and asked to sort them into piles. Each pile represented the group of statements that the launch participant felt belonged together. Participants were then asked to name each pile of statements that they had sorted, record the information on a sheet and return it to the research team. Next, each participant was asked to rate each of the statements on two five-point 'Lickert' scales. One scale measured importance and the other the feasibility of each statement.

Data analysis consisted of quantifying the sorting process through performing regression analysis that produced a point map. Clusters' of statements were created using the Sorting that participants had conducted. The Rating information provided by participants was used to determine which individual statements and/or groups of statements were most important and most feasible. Using the average ratings of statements within Clusters we were able to display those statements that scored high for both importance and feasibility. This produced Concept Maps, which were a visual representation of how the participants viewed and valued individual statements and group of statements. Furthermore, we created 'Go-Zones' which were visual representations of those statements rated as both important and feasible by the participants. We then identified those statements that were rated highly, and organized them into three groups: 1) knowledge, technology, education and information needs 2) post-harvest issues and 3) contextual issues.

Participants stated that farmers could not produce enough food from traditional farming including home garden, terrace farms and shifting cultivation due to poor soil fertility, water scarcity, limited access to quality seeds, fertilizers and pesticides, labor shortage, poor transportation and access to market. In particular, many challenges were identified for livestock breeding and fish farming. Many households depend on remittance money and may be less interested in producing their own foods. Participants reported that farmers need new knowledge and information on improved farming technologies, particularly upland agriculture, crop diversification, soil and water management, insects and pests control and management, post-harvest and value added products, and market information.

The Concept Mapping research study provided a wealth of information about stakeholder perceptions of issues or needs and their wishes and desires. This diverse group included farmers, community members, representatives from government organizations, international and local NGOs, CBOs, CSOs, and UN organizations involved in food and nutrition related activities in Chin State. The study suggests that the increased availability and accessibility of food for households in the project villages has two primary foci: firstly, farmers need to know more about; improved food production technologies (crop, livestock and fisheries); crop diversification; modernized upland farming practices; soil and water management; access to agricultural inputs, including quality seeds, fertilizers, pesticides and insecticides. Secondly they need more knowledge about post harvest issues; including storage, processing, value-addition activities and market access. In terms of food utilization, farmers and community members have poor or limited knowledge of nutrition, dietary diversity, food safety and good hygiene practices. Providing education and advisory services to farmers is very much needed. Therefore, statements related to knowledge, education, technology and information were rated very highly for both importance and feasibility.

The study also examined the needs of farmers and community members from the 24 villages with regards to food and nutrition security. Whilst the study generated information about the challenges and opportunities for food production (crops, livestock and fisheries), food processing, food distribution and marketing, and food consumption, it also revealed larger contextual issues that need to be addressed. Existing agricultural extension services provided by Department of Agriculture are very limited. Demand driven agricultural extension education and advisory services are needed and Nutrition Sensitive Agriculture approaches need to be introduced to address farmer needs and challenges. The study also offers recommendations to agricultural training institutions and Department of Agriculture. on research, training and extension needs

In addition to changes in agriculture sector behaviours, government can promote nutrition-sensitive agriculture by incorporating nutrition-sensitive concepts into their relevant policies and programs. Recently, international development partners have been implementing food security and nutrition related initiatives in Chin State in collaboration with civil society organizations and government organizations including Department of Agriculture, Department of Public Health, Department of Education and others. However, collaboration and cooperation amongst the organizations and agencies are still weak and farmers and rural community members need additional knowledge and information on upland agriculture and farming systems, farm business management and household nutrition to improve their livelihoods and food and nutrition security.

1. Introduction and Background Information

Assessing the requirements for food and nutrition security in 24 villages of Hakha Township, Chin State, Myanmar through Concept Mapping methodology is a pilot action research study under a three-year project of the Myanmar Institute for Integrated Development (MIID) in partnership with Cornell University in New York, that is funded by the Livelihoods and Food Security Trust Fund (LIFT). The overall goal of the study is to (1) contribute to food and nutrition security improvement and poverty alleviation among vulnerable rural people in Chin State through Farmers Field School extension education on upland farming, food and nutrition, and nutrition sensitive agriculture practices, (2) providing recommendations to improve curricula at Chin State Agricultural Institute, Yezin Agricultural University, and (3) to strengthen the existing agricultural extension programs of Chin State Department of Agriculture.

Nutrition-sensitive agriculture is a food-based approach to agricultural development that puts nutritionally rich foods, dietary diversity, and food fortification at the heart of overcoming malnutrition and micronutrient deficiencies. The approach stresses the multiple benefits derived from enjoying a wide variety of foods, whilst recognizing the nutritional value of food for good nutrition, and the importance and social significance of the food and agricultural sector for supporting rural livelihoods. The overall objective of nutrition-sensitive agriculture is to make the local food system better equipped to produce good nutritional outcomes.

The Union of the Republic of Myanmar is self-sufficient in terms its food requirements if total production is balanced against internal demand. However, according to the diverse agro-ecological conditions, crop production patterns are significantly different from region to region. Generally, in hilly and remote areas and some parts of the central dry zone, crop productivity is lower than that of other regions and in these areas there is a deficit in staple crops.

Improved nutrition depends on the availability and knowledge of healthy, nutritious and safe foods and cooking methods, financial and proximal access to those foods, as well as the capacity to readily absorb the food's nutrients. According to the Ministry of Health and Sport's National Nutrition Centre, Myanmar is suffering from five major malnutrition problems, including protein energy and micronutrient deficiencies (especially Vitamin A, Vitamin B1, Iodine and Iron). The Ministry reports that hypertension and Type 2 diabetes are now emerging as a health related problem associated with 'over-nutrition'. According to government estimates, Chin State is one of the poorest areas of Myanmar and suffers from insufficient food and nutrition security with 73% of the estimated 500,000 population living below the poverty line.

The main purpose of the MIID-Cornell LIFT funded project '**Securing Positive Nutritional Outcomes through Agricultural Extension, Nutrition Education and Institution Building in Rural Chin State (NOAC)'** is increasing incomes for rural households and improving the food and nutritional security of the most vulnerable people, particularly women and children. This 3-year project proposes an integrated approach that would support poor rural households

through a combination of education and advisory services for improved farming practices, and increased production and sale of high value crops. The promotion of integrated farming include backyard livestock and fish farming, home gardening, nutrition sensitive agriculture, nutrition education including food safety, sanitation and hygiene practices, promoting the role of women in agriculture and linking smallholder farmers to markets. The project also aims to strengthen local academic and government institutions involved in agriculture and agricultural education.

The NOAC project will link communities, civil society, government, private sector and agricultural education institutions, Yezin Agricultural University and Chin State Agricultural Institute in planning and executing efforts to increase household resiliency that will ultimately achieve the core objective of improved nutrition in the target areas.

The project contains three distinct but complementary areas of activities:

- Strengthening of Agricultural Education Institutions
- Farm-based Nutrition Sensitive Agricultural Extension Education
- Capacity building for good nutrition practices and women's empowerment

Since the project is complex and a series of diverse activities in planned for a short period of time, Concept Mapping is relevant to project planning in order to identify the food and nutrition security needs of the target population. Concept Mapping was created and developed by Cornell University Professor Dr. William Trochim in 1989. It is used by the National Institute of Health and National Science Foundation in the United States as well as researchers worldwide to gather information from discreet groups and to organize this information for planning and evaluation purposes.

NOAC project staff from MIID and the senior technical researcher from Cornell University conducted the Concept Mapping study through a series of workshop, face-to-face interviews and focus group discussions with representative stakeholders group including farmers, producers, community members, village leaders, school teachers, village health workers and midwives; government officials, local and international NGOs, Community-based organizations, Civil Society organizations, and UN organizations involved in food and nutrition related projects in Chin State in the 24 villages of Hakha Township and the city of Hakha.

Results of the study will be used to guide project activities and for designing curricula for Agricultural Education Institutions, Training of Trainers, Training of Facilitators, and Farmers Field Schools, particularly Nutrition Sensitive Agricultural Extension and Community Nutrition Education trainings. This information will also be useful to academics (YAU and SAI-Lungpi) for research purposes and for improving curricula, for policy makers to inform broad decision making, and for government officials to design platforms and extension and training programs. Farmers and community members may find that a scaled down version of the report that simply lists preferences and issues is useful for local discussion and validation.

2. Concept Mapping Methodology and Applications

Concept Mapping is a process that allows information to be collected from a variety of stakeholders and to be organized through statistical analysis to produce a visual representation that captures common trends without losing more subtle information.

> ***"Concept Mapping is a structural process, focused on a topic or construct of interest, involving input from multiple participants, that produces an interpretable pictorial view of their ideas and concepts and how these are interrelated. The process is participatory in that it is inherently a mixed methodology that integrates high-quality qualitative and quantitative techniques" (Trochim 1989).***

Concept Mapping can be used in a broad variety of projects that require high levels of stakeholder involvement and address the complexities of merging inputs from stakeholders with different viewpoints, literacy levels and expertise. In developing curricula, programs, policies, and evaluation studies, this tool moves the process forward by merging broad inputs with statistical analysis.

The goal of this study is to offer recommendations that will lead to improvement of the existing agricultural extension programs of the Chin State Department of Agriculture, development of curricula for Agricultural Education Institutions, Training of Trainers, Training of Facilitators, and Farmer Field Schools that focus on nutrition sensitive agriculture that will assist local farmers and community members in meeting food and nutrition security and maximizing profits. Access to agriculture and food production technology is very important but the adoption of new technologies depends on a clear understanding of their value and benefit. To support this, Concept Mapping was used to ensure high levels of participation by stakeholders who are asked to prioritize and assess the feasibility of issues related to food and nutrition security.

The intended audience for this study includes farmers, community members, village administrators, teachers, midwives, health workers, extension professionals, policy makers, representatives from Community-based Organizations (CBO), Civil Society Organizations (CSO), local and International NGOs, and UN Organizations, involved in food and nutrition related activities in Chin State. The result of the Concept Mapping can be presented in a variety of ways that best meet the needs of any one group; i.e. brief visual displays of high priority outcomes or more academic examinations of relationships between priority areas. Figure 1 and 2 show the process of Concept Mapping data collection and data analysis.

The Concept Mapping process requires a focus question 'prompt' that generates a single idea to complete a statement. After discussion with the NOAC project management team it was decided to use a prompt that would solicit responses that informed not only the needs of food and nutrition security but also food production and consumption issues. In our introduction to the prompt the facilitators were informed of their interest in providing education and information about upland farming practices and household nutrition to address food and nutrition security issues but wanted to know what problems the assistance could help alleviate.

Figure 1: Concept Mapping Data Collection

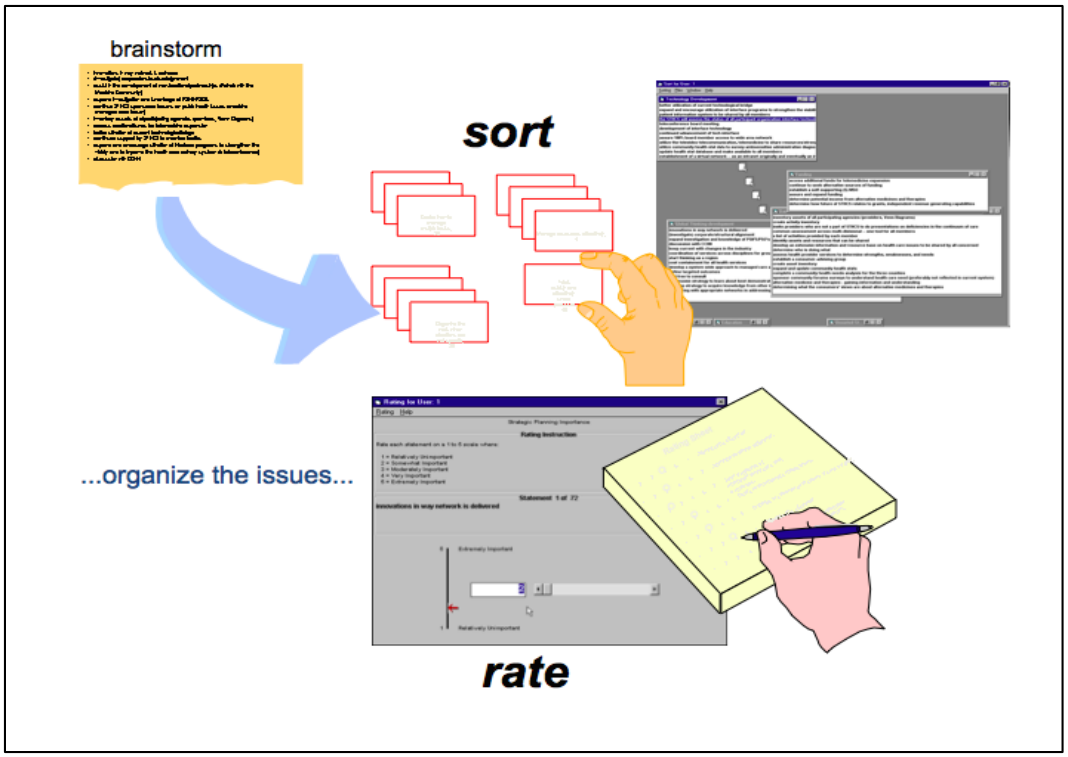
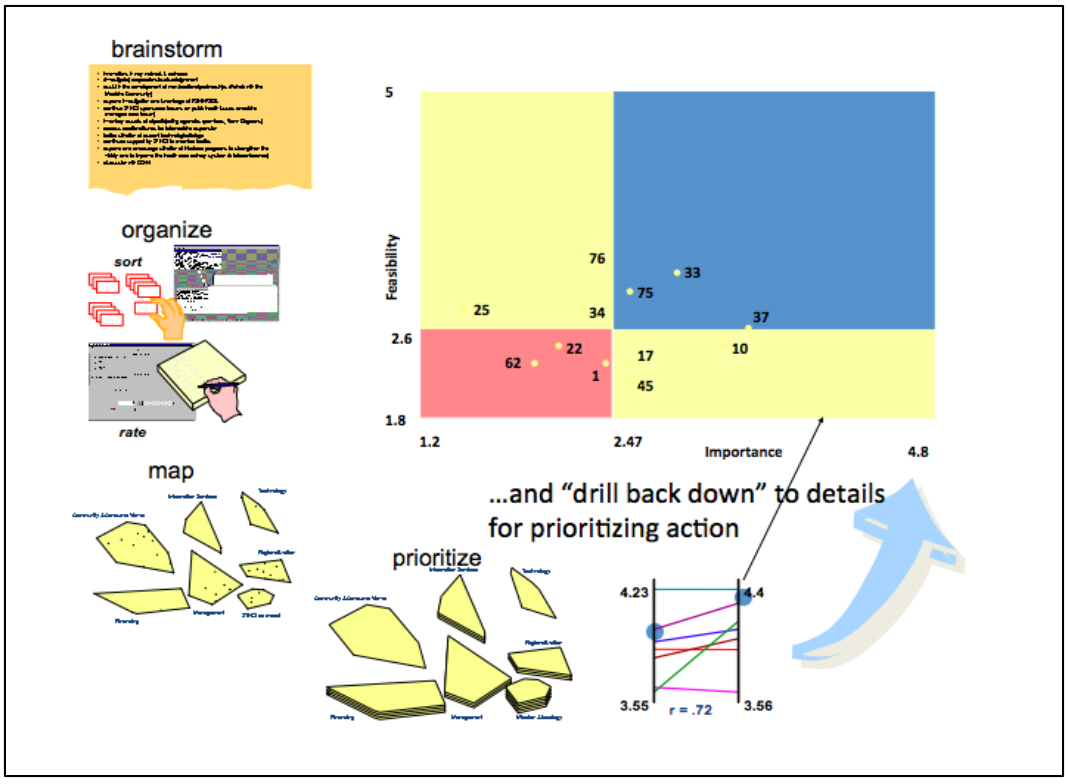


Figure 2: Concept Mapping Data Analysis



3. Study Areas and Data Collection

The Concept Mapping Exercise is an active participatory process in which diverse stakeholders from all parts of society participate in a process to solicit responses that provide insight into food and nutrition security and food production and consumption. In this case, the prompt used was "***The main causes of people in your area not having enough food are …".*** This prompt was shared in two ways: firstly during group meetings with participants where they brainstormed responses; secondly, during the course of one-on-one interviews that were conducted in different community settings. The prompt was prepared in three different languages: English, Myanmar and Chin and pre-testing was conducted with community members through face-to-face interviews and focus group discussions (FGD) in five of the project villages.

The Concept Mapping process included collecting a broad array of brainstormed ideas, knowledge and opinions on not having enough food; organizing these ideas and prioritizing the issues of not having enough food; and determining what can be done to address food and nutrition security in the project villages focusing on food productivity, food availability, food accessibility and food utilization.

In September 2016, the MIID-NOAC project staff traveled to 24 villages in Chin State and conducted face-to-face interviews and focus group discussions with women, farmers, village heads and administrative committee members, village health workers, midwives, schoolteachers and church leader. Since the project villages are located far from each other, data collection commenced in 14 villages between September and October and in the remaining 10 villages in November and December. Face-to-face interviews were also conducted with representatives from government, non-government and other organizations in December 2017. The location of project villages is shown in Figure 3. Some demographic data and information about crops grown and animals raised in each village was also collected.

The MIID-NOAC project team developed and introduced a participatory and systematic approach to ensure that the voices of the traditionally "voiceless", i.e. the poorest people, were taken into account. A wealth ranking exercise preceded the Concept Mapping activity at village-level to identify households from different wealth ranks, i.e. "well off", "not so poor", "poor" and "poorest". This step was necessary to ensue that the poor and poorest household representatives freely participate in the Concept Mapping process. Ultimately, improved nutrition-sensitive upland agricultural extension services ought to benefit these poorer segments of village society. Figure 4 shows the framework for data collection for the Concept Mapping and Wealth Ranking exercises.

Focus group discussions were conducted with homogeneous groups of "poor" and "poorest" women as well as with "poor" and "poorest" farmers in each village. The advantage of using FGD is that they can generate a dynamic within the group giving participants (1) more confidence in speaking out among his/her own peers, (2) leading to a broader discussion and

raising more diverse ideas and perceptions, and (3) eliciting a greater number of responses to one idea or question as an answer by one group member may trigger additional responses from other FGD participants.

Figure 3: Location Map of Project Villages in Hakha Township

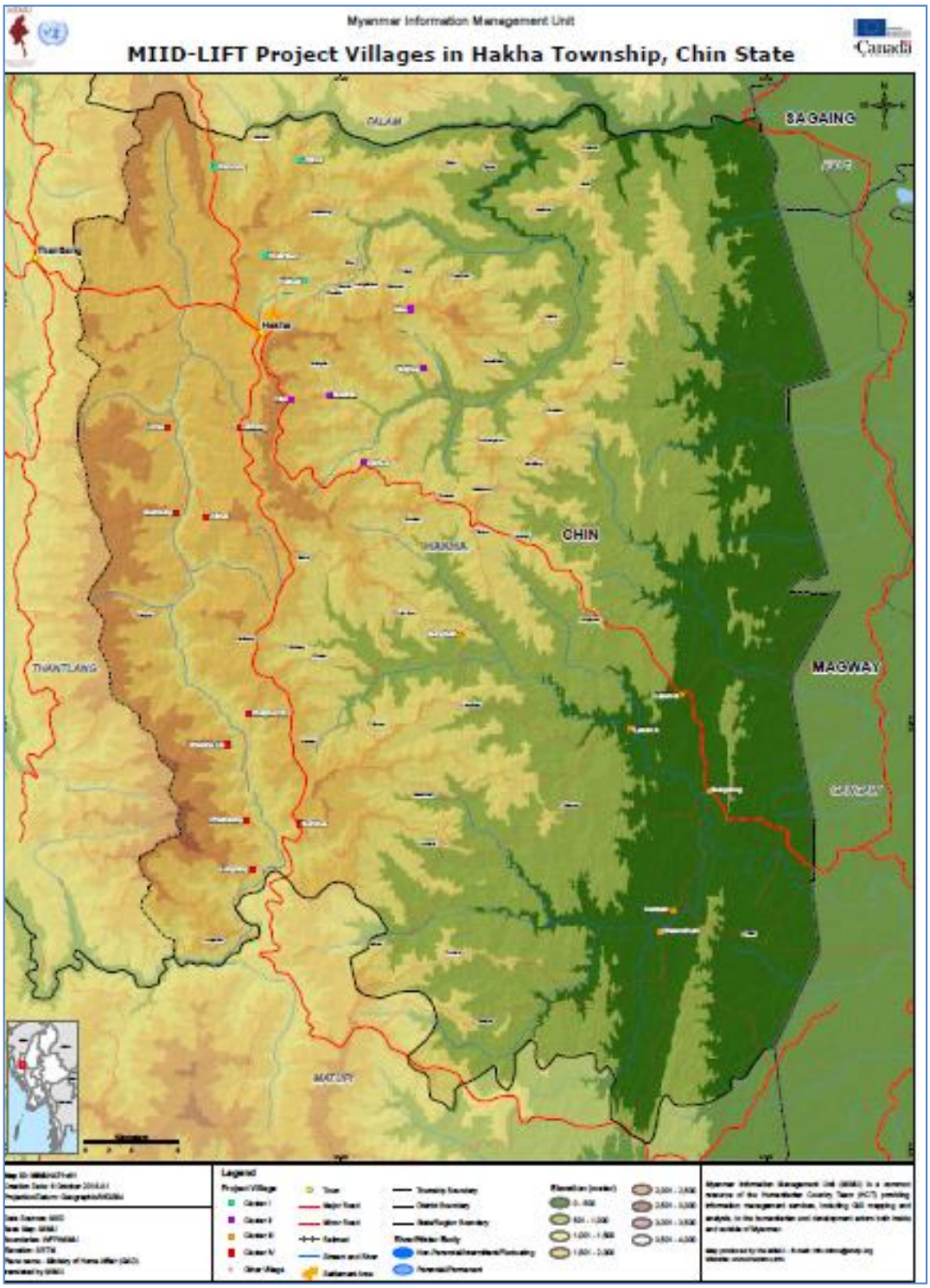
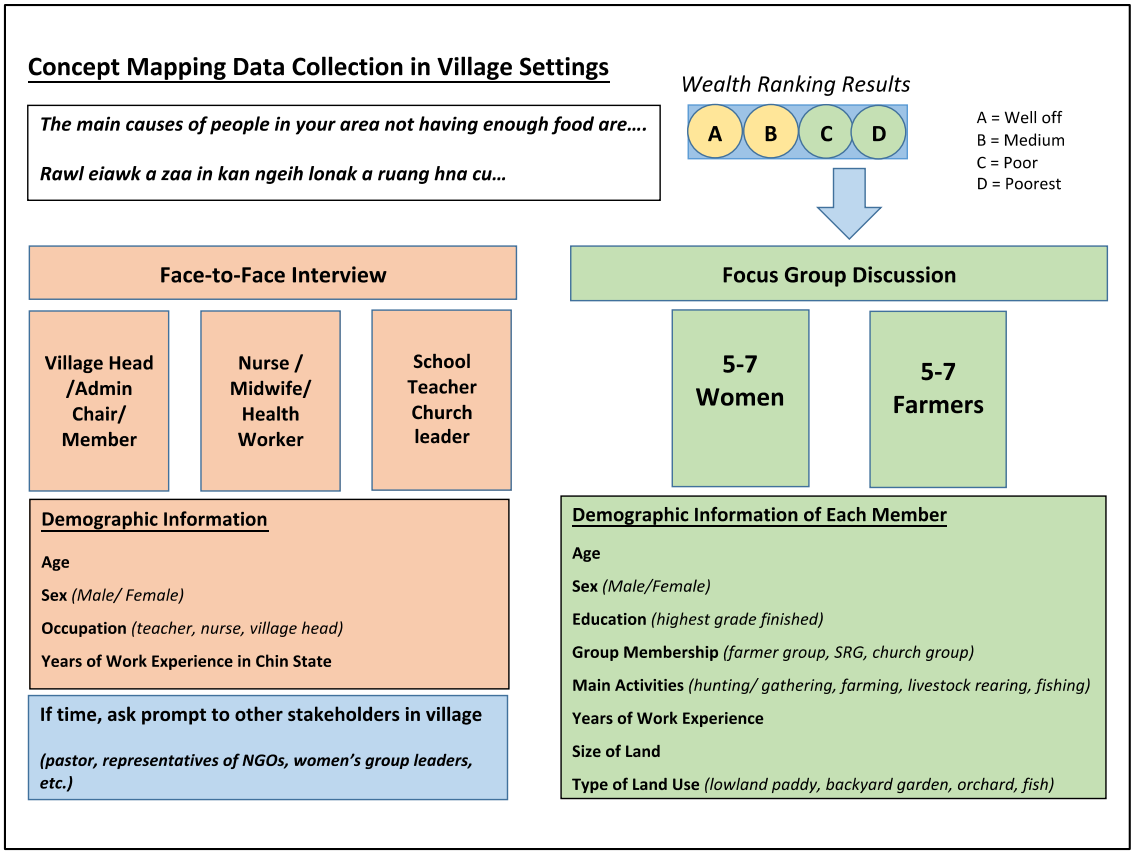


Figure 4: Framework of Data Collection in Village Settings



4. Concept Mapping Data Analysis

All responses to the prompt ***"The main causes of people in your area not having enough food are…"*** from both face-to-face interviews and focus group discussions were recorded in either Chin, Myanmar or English according to the language spoken by the participants and finally all responses were organized for analysis in English.

High levels of participation of women and men were achieved in all of the villages. A total of 346 participants from 24 villages generated 1,068 ideas from brainstorming, and 17 participants from government organizations, local and international NGO, CSO, CBO and UN organizations generated 128 brainstormed ideas, opinions and pieces of information. After all brainstormed ideas were organized and carefully reviewed, 150 statements were generated for Sorting and Rating in the Concept Mapping process. The statements were entered into the Concept System that creates sorting cards (one statement per card) and rating sheets, and printed for the Sorting and Rating Exercises (See Appendix B).

A Concept Mapping workshop with diverse stakeholders groups was conducted in Hakha on January 2017, at which the preliminary results from analyses were shared with stakeholders. Representatives from the Department of Agriculture were unable to participate in the Sorting and Ratings exercise and they provided their responses to the research team at a later date. Participants included 48 representatives from the 24 project villages (2/village) who had participated in the Concept Mapping brainstorming exercise, and 26 representatives from different organizations, some whom had participated in brainstorming exercise and some whom were new participants. Instructions were given on how to sort and rate the statements in the Myanmar national language. In addition, MIID project staff provided Chin language support to help farmers and community members better understand the sorting and rating exercises.

Each participant was given a deck of 150 statements and asked to sort them into piles with each pile representing the group of statements that the participant felt belonged together. Some participants generated a larger number of piles with discreet groupings while other participants would have fewer piles encompassing more diverse statements. The participant was then asked to name each pile of statements that he/she had sorted, record the information on a sheet and present it to the research team. After this, the participant was asked to rate each of the statements on two five-point "Lickert" scales, -one scale measuring the importance and the other the feasibility of each statement. Finally, the participant completed a small demographic questionnaire to establish his/her affiliations. The research team then collected this information and all data were entered into the Concept Mapping software program. Responses from the 46 farmer and community member participants were sorted and rated as a group while participants from government, non-government and other organizations were sorted and rated individually.

Data analysis consisted of quantifying the sorting process by performing regression analysis that produces a point map. The researcher was able to create “Clusters” of statements by suggesting a total number of clusters for each map. The researcher reduced the number of clusters until the point that the “bridging value” suggested that this was the minimum number of clusters that could be presented whilst still maintaining the efficacy of the individual statement groups. In this study the researcher used Nine-Cluster Map analysis and the program created the following statistical data analysis reports: Mean scores of all statements in each Cluster, ANOVA, Point Map, Point Cluster Map, Point Cluster Ratings Maps, Bar Chart, Pattern Matching with relative scale, and Go-Zones.

The Rating that participants gave to each statement were totaled and used to provide a mean value for each statement. The Rating data allowed the researcher to determine which individual statements were relatively more important or feasible as well as which Clusters were viewed as more important and feasible. The researcher then produced a GO-ZONE chart for each Cluster. This chart was a product of four-quadrant diagrams with the mean scores of all statements within that Cluster displayed. Determining the mean scores of all statements in the Cluster for both variable importance and feasibility, and plotting those on the X-axis and Y-axis created the quadrants. Statements that are displayed in the upper right quadrant of the GO-ZONE chart are items that were rated above the Cluster mean in terms of both Importance and Feasibility. These are thought of as possible areas for implementation or support. Statements that are above the Cluster mean for only one dimension are displayed in either the High Importance or High Feasibility quadrants. Statements that are below the Cluster mean for both measures are in the Low Importance and Low Feasibility quadrants.

Analysis of a Concept Map provides a wealth of information about stakeholder perceptions of issues, needs, wishes and desires. In this study the Concept Map provided three kinds of information. Firstly, the Map identified a single Cluster of statements that dealt specifically with agriculture and food production and the needs for knowledge, education, and information. Secondly, the Map had a set of Clusters that dealt with the issues of food production and food consumption including crops, livestock, fish, seeds and storage, soil and water management. Thirdly, the Map had a set of Clusters that were contextual, representing the needs associated with food production, food accessibility and food utilization but that might not be directly addressed within a two-three year period. Examples of this could include Clusters named “Market & Transport”, “Labor & Migration”, and “Weather, Climate, Disaster”. There were a variety of issues associated with how farmers could produce enough food for their families and communities. Clearly, for some farmers the shift from conventional farming to innovative and modernized farming will require new information and knowledge, as well as fundamental shifts in their ways of thinking.

5. Research Findings and Discussion

The Concept Mapping study involved over 375 participants representing farmers, community members, midwives, school teachers, village heads and village administrative committee chairs and members, village health workers, church leaders from 24 villages and representatives from government and non-governmental organizations, CBO, CSO, and UN organizations participated in the Brainstorming, Sorting and Rating activities. Participants responded to the prompt "***"The main causes of people in your area not having enough food are…"*** through face-to-face interviews and focus group discussions, generating a total of 150 statements. These statements were sorted, rated by participants groups and then analyzed using the Concept Mapping program. Table 1 and 2 show summaries of Cluster Ratings for variable importance and feasibility. The Point Map (Figure 5) and Point Cluster Map (Figure 6) illustrate how the participants sorted the 150 statements.

Table 1: Summary of Clusters Rating Variable: Importance

Cluster Name	N	Mean	SD
1. Knowledge & Information	29	3.85	0.49
2. Soil, Water, Land Issues	19	3.76	0.35
3. Seeds & Storage	6	3.72	0.31
4. Technology & Education	25	3.56	0.59
5. Weather, Climate, Disaster	12	3.49	0.33
6. Market & Transport	12	3.45	0.69
7. Money Management	22	3.38	0.57
8. Livestock, Insects & Pests	18	3.29	0.54
9. Labor & Migration	7	3.09	0.63

Table 2: Summary of Cluster Ratings Variable: Feasibility

Cluster Name	N	Mean	SD
1. Knowledge & Information	29	3.77	0.71
2. Seeds & Storage	6	3.33	0.74
3. Soil, Water, Land Issues	19	2.71	0.89
4. Technology & Education	25	2.71	0.86
5. Livestock, Insects & Pests	18	2.71	0.66
6. Market & Transport	12	2.64	0.69
7. Labor & Migration	7	2.58	0.87
8. Money Management	22	2.04	0.52
9. Weather, Climate, Disaster	12	1.73	0.30

Figure 5: Point Map

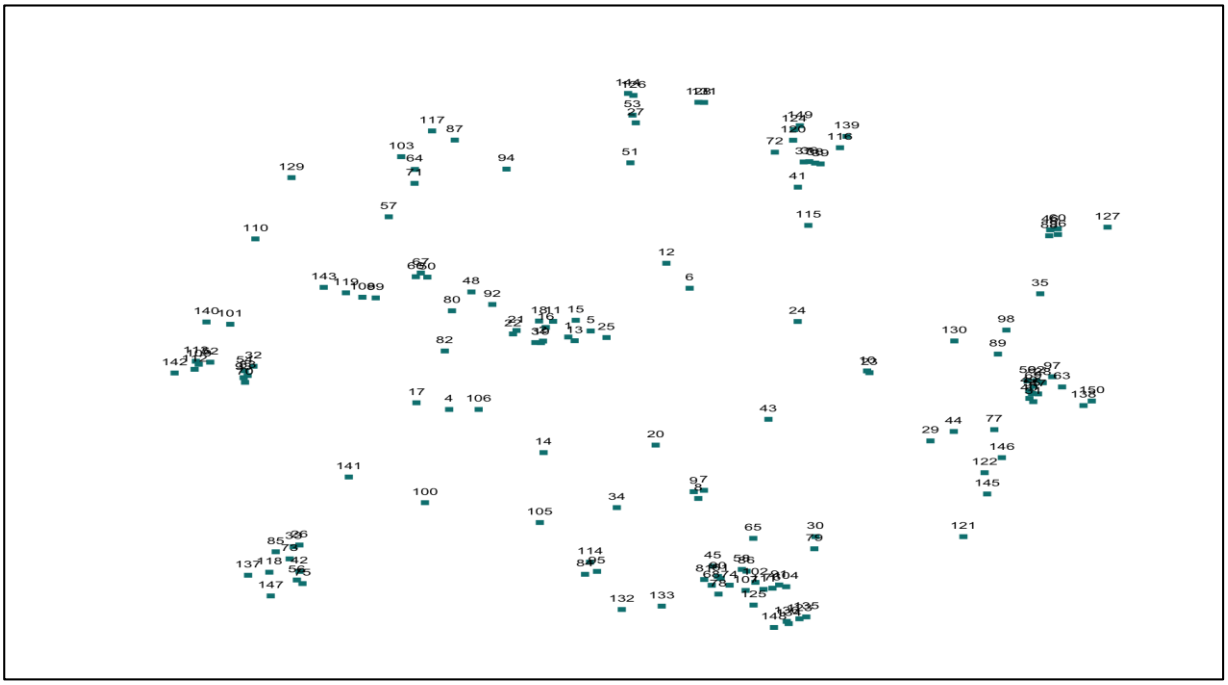
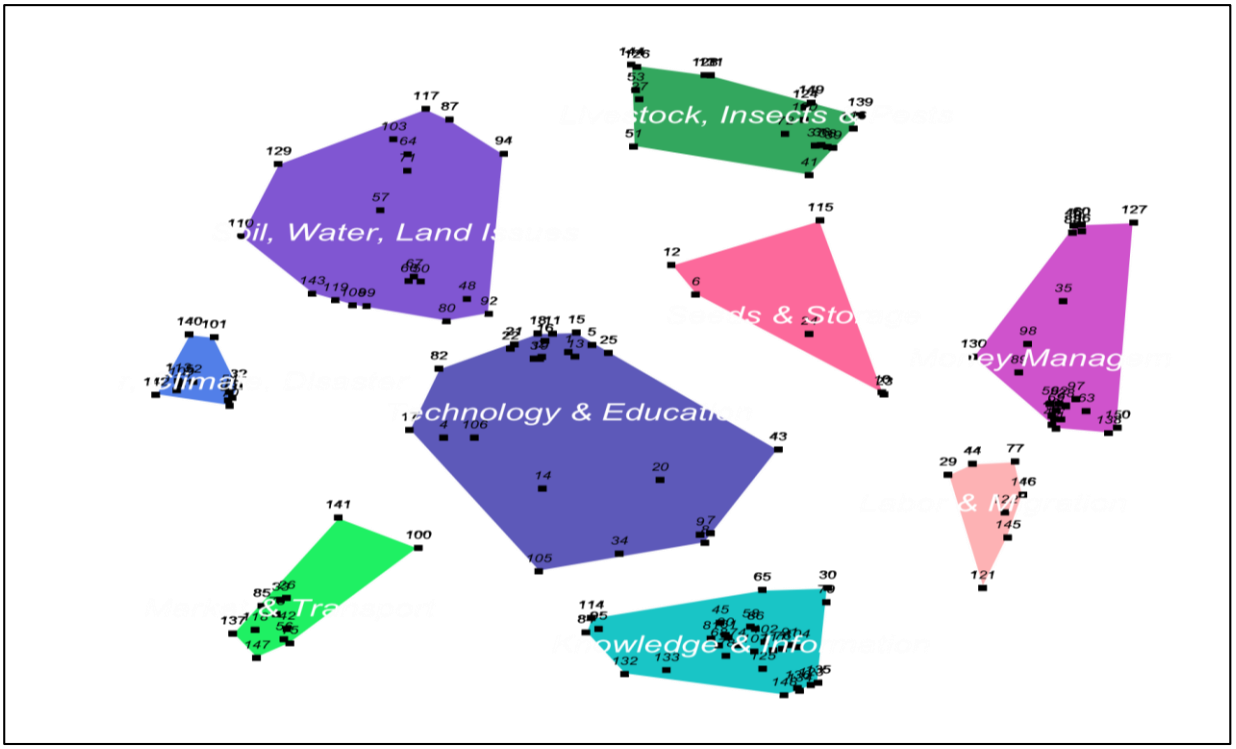


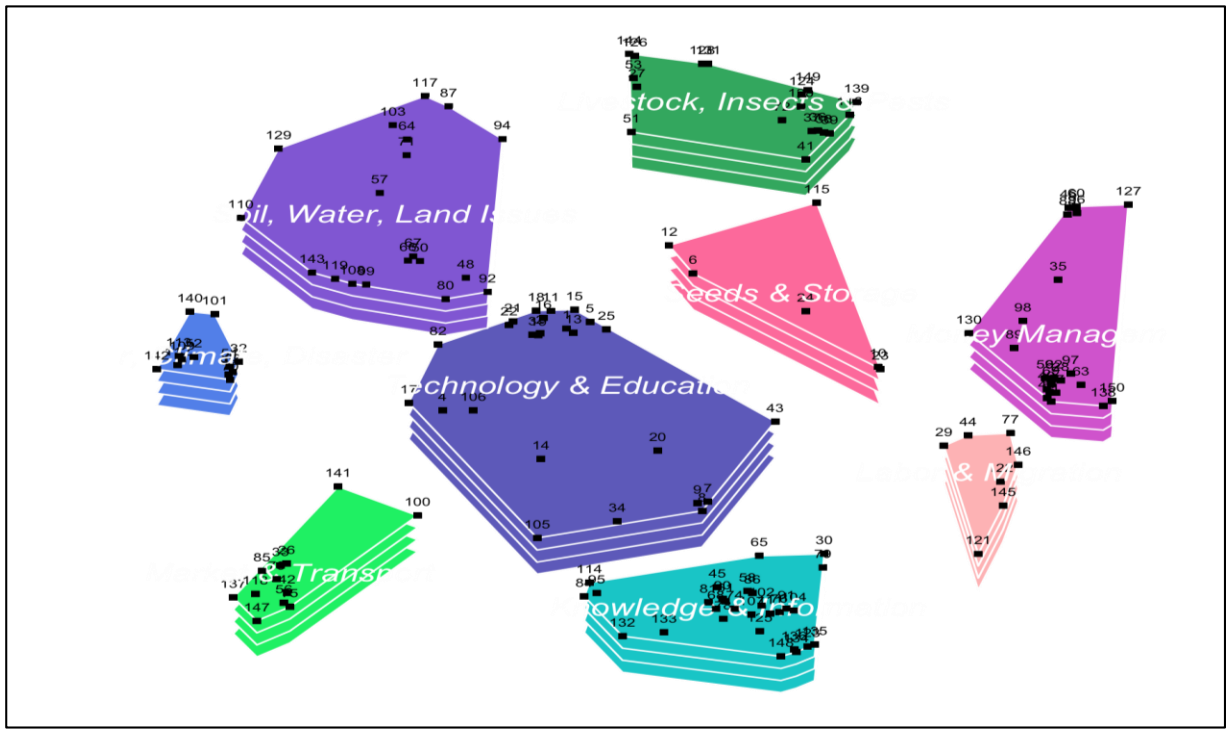
Figure 6: Point Cluster Map



5.1. Importance

Participants rated each statement on a five-point scale with 5 representing the most important and 1 the least important. Values for all statements were collected, combined and used to generate a mean score for each statement within each Cluster. The combined value of these statements was then used to generate a mean score for the entire Cluster. Figure 7 shows the Cluster Rating map for importance ratings in the study. Statements for each Cluster with their individual mean values are shown in the Table in Appendix A. The participants rated almost all of the Clusters as 'very important' while some individual statements in each Cluster were rated as 'extremely important'. These results suggest that five Clusters, with the mean score ranges from 3.85 to 3.49; 'Knowledge & Information' (3.85); 'Soil, Water, Land Issues' (3.76)'; 'Seeds & Storage' (3.72); 'Technology & Education' (3.56), and 'Weather, Climate & Disaster (3.49)' are considered more important than the Clusters for 'Market and Transport' (3.45); 'Money Management' (3.38); 'Livestock, Insects & Pests' (3.29) and 'Labor & Migration' (3.09). More details will be explained in the GO-ZONE analysis.

Figure 7: Point Cluster Rating Map (Importance)



5.2. Feasibility

Participants rated each statement on a five-point scale with 5 representing the most feasible and 1 the least feasible. Values for all statements rated by participants were collected, combined and then used to generate a mean score for each statement within a Cluster. The combined value of these statements was then used to generate a mean score for the entire Cluster. The Cluster Map shows the overall value of a Cluster by the number of levels is shown in Figure 8.

Figure 8: Point Cluster Rating Map (Feasibility)

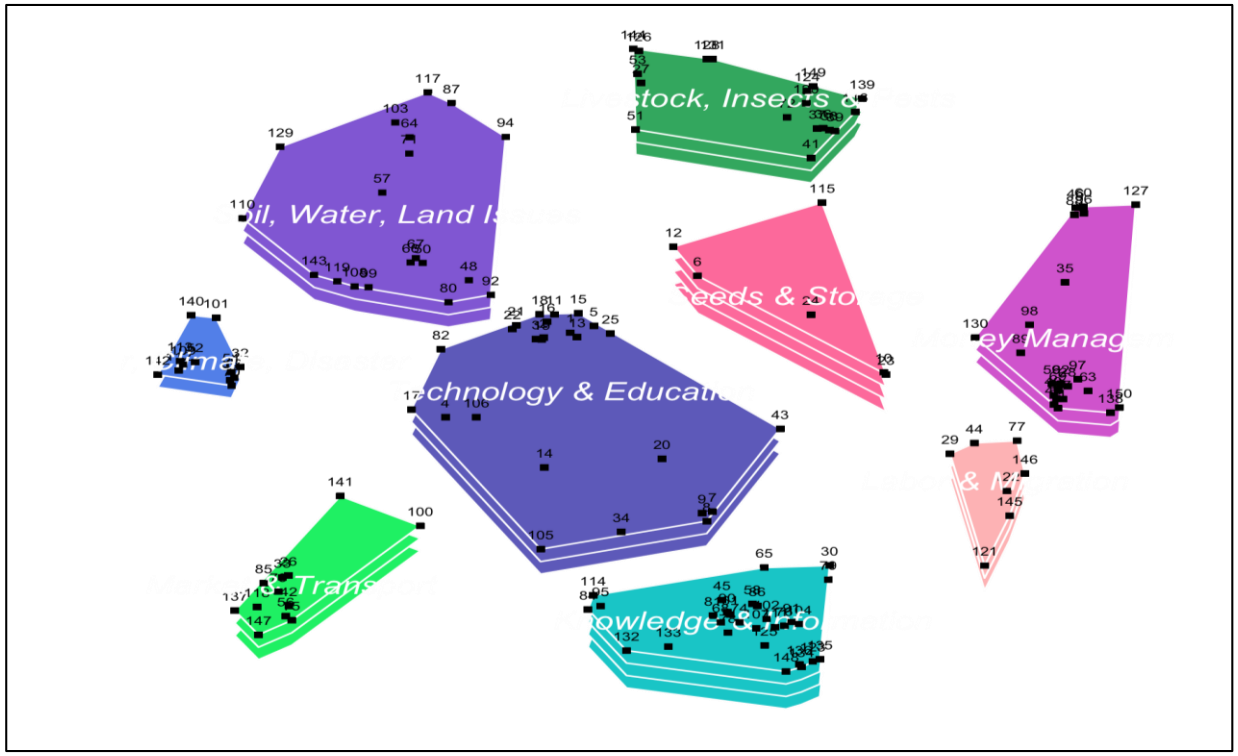


Figure 8 shows the Cluster Ratings map for feasibility ratings in the study. Statements for each Cluster with their individual mean values appear in Appendix A. The group rated two Clusters as high in Feasibility: 'Knowledge & Information' (3.77) and 'Seeds & Storage' (3.33). The following six Clusters were considered moderate, i.e, somewhat feasible: 'Soil, Water & Land Issues' (2.71); 'Technology & Education' (2.71); 'Livestock, Insects & Pests' (2.71), 'Market & Transport' (2.64), 'Labor & Migration' (2.58), and 'Money Management' (2.04). The Cluster 'Weather, Climate & Disaster' (1.73) was considered less feasible than other Clusters. More on this analysis is explained in the GO-ZONE analysis where individual statements are rated in terms of importance and feasibility.

Participants were from diverse groups, including farmers, school teachers, midwives, village health workers, village administrators, church leaders and representatives from different organizations. Participants contributed their perceptions, ideas, knowledge and information to the study. For Concept Mapping Sorting and Rating, 20 responses from farmers and 26 responses from different organizations including government, non-government, CSO, CBO and UN organizations were collected. Participant responses show that one of the main causes of food insecurity in their areas was a lack of knowledge and information about improved farming practices. This included upland agriculture, high value crop production, soil & water management, pest, insect control & management, quality seed production, access to agricultural inputs, fisheries & livestock, post-harvest technology, value added technology and market information.

Participants rated the Clusters 'Knowledge & Information' and 'Seeds & Storage' as very high in terms of both importance and feasibility (Figure 9 & 10). In almost all Clusters, statements relating to knowledge, education, technology and information were considered very important and very feasible. Two Clusters 'Money Management' and 'Weather, Climate, Disaster' were rated very highly in terms of Importance but very low in feasibility.

Figure 9: Bar Chart

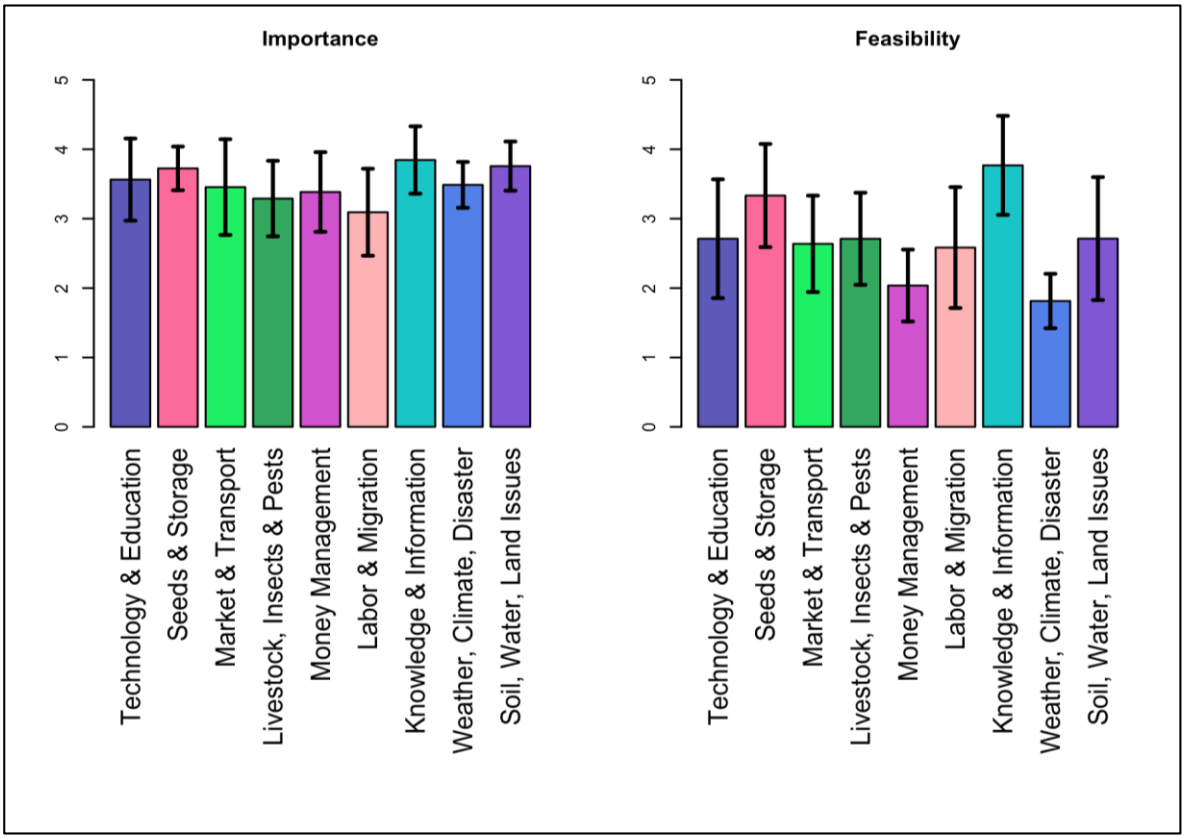
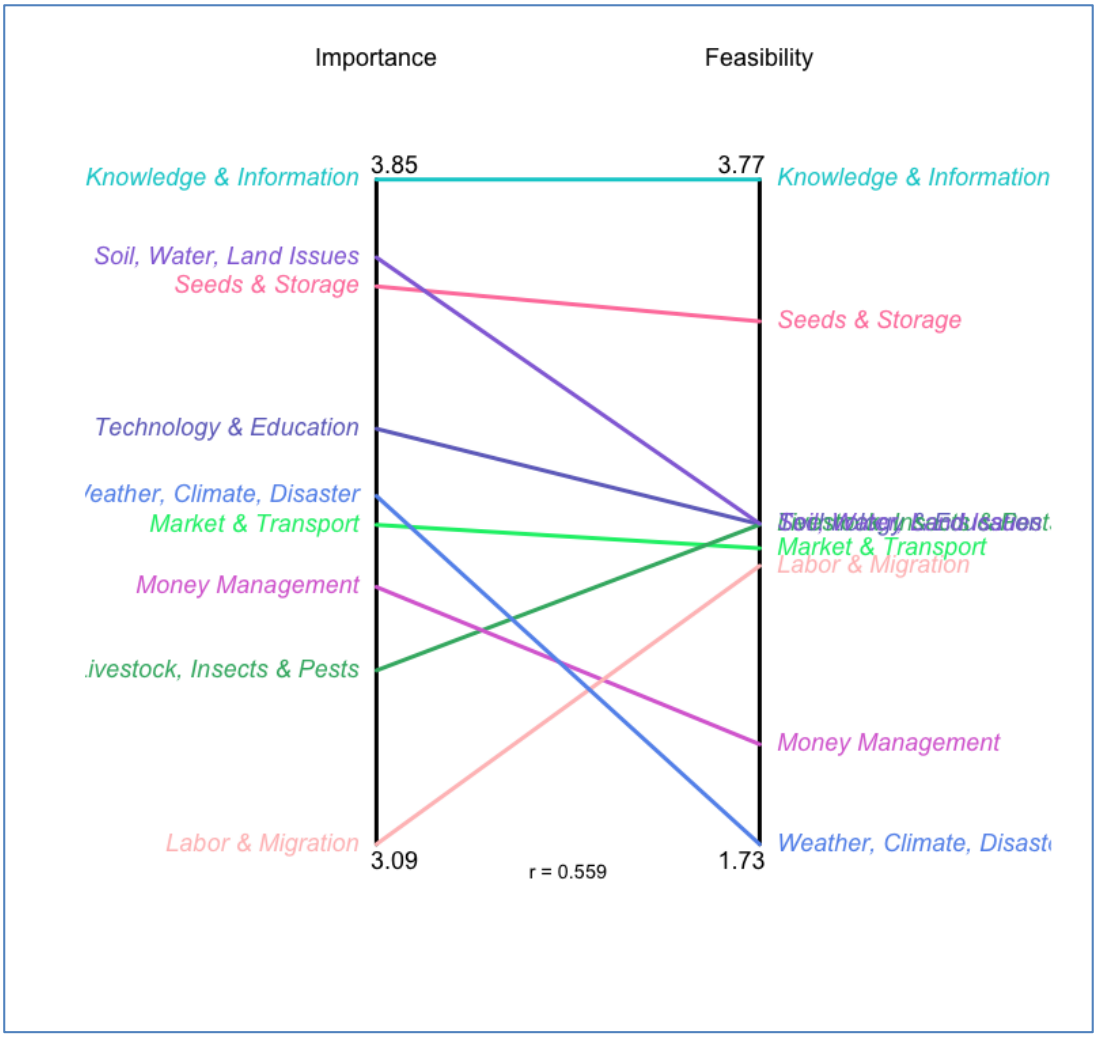


Figure 10: Pattern Matching – Relative Scale



Five Clusters ' Technology & Education', 'Soil, Water, Land Issues', 'Market & Transport', 'Livestock, Insects & Pests', and 'Labor & Migration' are rated very high in importance but low in terms of feasibility (Figure 10).

The study suggests that increasing the availability and accessibility of food for households in the project villages has two primary foci. Firstly, farmers need to know more about improved crop production technologies, crop diversification, modernized upland farming practices, soil and water management, access to agricultural inputs including quality seeds, fertilizers, pesticides and insecticides etc. Secondly, they need more knowledge about post harvest storage, processing and value-added activities. In terms of food utilization the research suggests that farmers and community members have poor, limited or no knowledge about nutrition, dietary diversity, food safety and good hygiene practices. Providing education and advisory services to farmers is much needed. Statements related to knowledge, education, technology and information were rated very high in terms of importance and feasibility.

5.3. GO-ZONES

The next step in this analysis was to create a GO-ZONE Chart for each cluster. The X-axis was created representing the highest to lowest mean scores for statements rated for variable 'Importance' within that cluster. Within the same cluster variable 'Feasibility' ratings were displayed on the Y-axis, again displaying lowest to highest mean scores. The mean values for all feasibility statements and all importance statements were calculated and the interaction of these means formed the four colored quadrants. Statements that fell in the green or GO-ZONE are those statements that were rated above the mean in terms of both Importance and Feasibility. The statements that fell in both yellow quadrants were not as likely to be adopted or supported easily. The statements in the red zone were considered to be the most difficult to accomplish (Figure 11 and Table 3). A total of 49 statements that fell in the green quadrant were rated above the mean in terms of both Importance and Feasibility.

Figure 11: Go-Zone for all Clusters

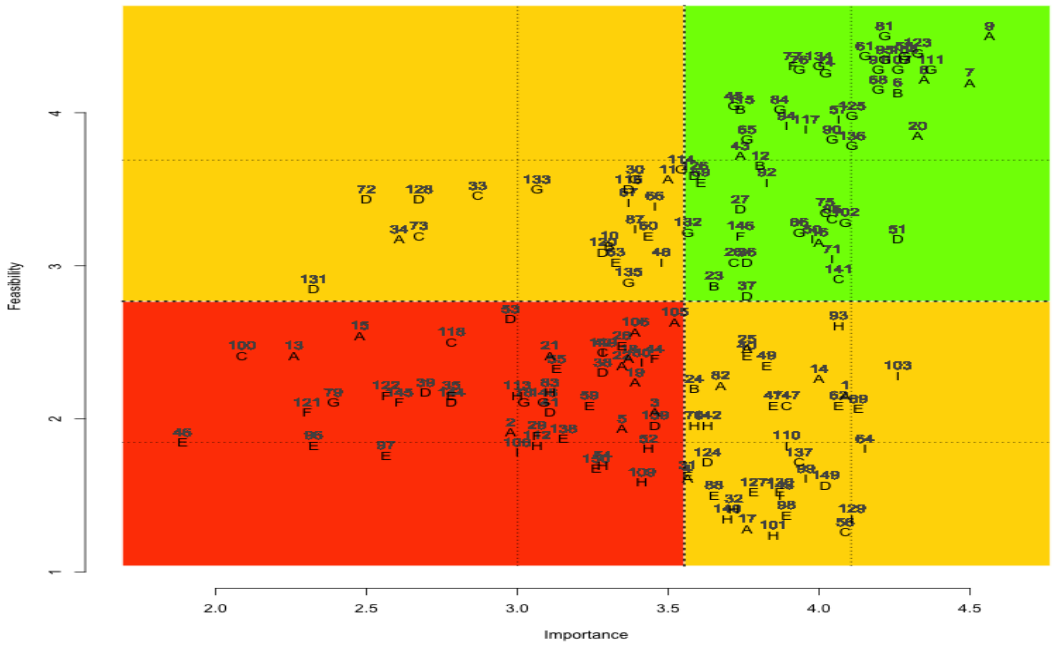


Table 3: Clusters with total number of Statements in Quadrant

Name of Clusters	Total number of Statements in Quadrant			Name of Clusters	Total number of Statements in Quadrant		
Knowledge & Information	21	5	3	Market &Transport	3	5	3
Seeds & Storage	5	3	0	Labor & Migration	0	1	9
Soil, Water, Land Issues	5	10	7	Money Management	4	9	6
Technology & Education	6	8	7	Weather, Climate, & Disaster	0	6	7
Livestock, Insects & Pests	5	7	6	**TOTAL**	49	54	47

Figure 12: Go-Zone with Importance & Feasibility Mean Ratings for Knowledge & Information

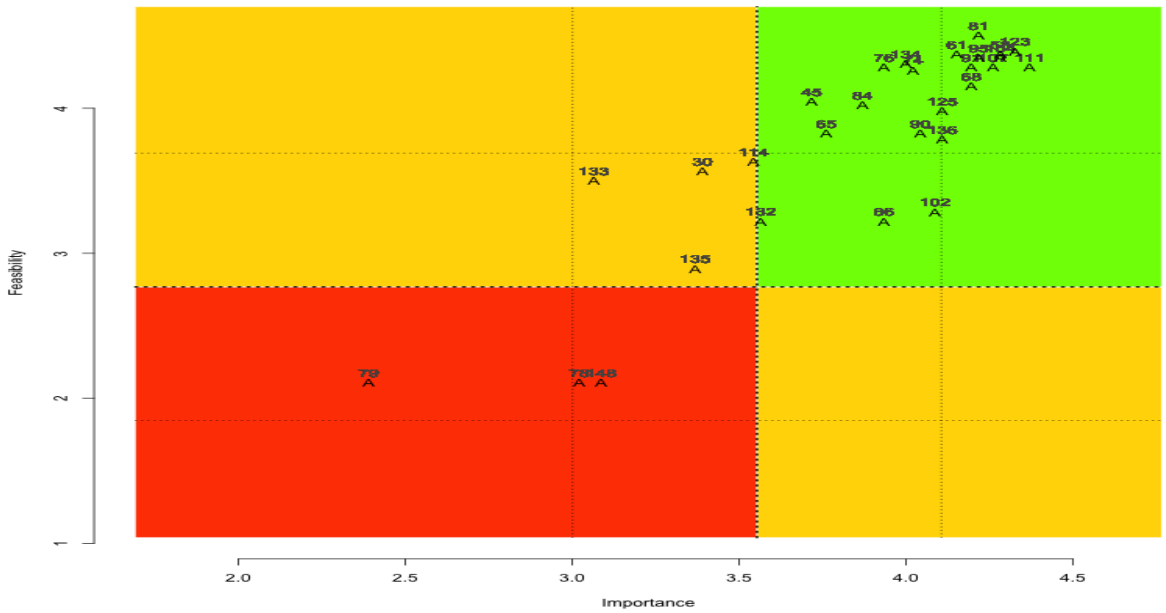


Table 4: GO-Zone Statements for the Cluster Knowledge & Information

ID	Statements
111	Limited agricultural knowledge on modern farming
123	Lack of education on food and nutrition in the communities
58	Lack of knowledge on upland agriculture leads to low yields
104	Limited awareness on food and nutrition information, such as Elephant Foot Yam
107	Lack of knowledge on soil management
81	Lack of knowledge and education about agriculture and farming systems
95	No access to improved farming technology
68	Poor 'Good Agricultural Practices' (GAP) lead to low yields
91	People spend money on unhealthy food instead of fresh food
61	Not enough food is produced due to the lack of agricultural knowledge
125	Lack of knowledge on agriculture and livestock farming
136	Pregnant women suffer from malnutrition due to poor food consumption
102	Destruction of forests by the people
90	Farmers did not apply the required fertilizers to get good crop yields
74	Food production was low due to the lack of application of fertilizers
134	Malnutrition and vitamin deficiency were found in primary school students
76	People do not have access to a diverse diet
86	People are not interested in growing their own food
84	Crop yields are low due to poor agricultural practices
65	Farmers grow few seasonal crops and the working season is short (4/12 months)
45	Lack of a seasonal crop calendar and agricultural knowledge, so people do not know when to grow crops

132	Corn, bean & Chin sesame are mostly grown in shifting cultivation but give low yields
114	Cabbages are being destroyed by worms and farmers got very low yields
30	Farmers do not grow high value crops so do not have enough money to buy food.
135	Lack of food causes malnutrition in Chin State
133	Substitute sunflower production on destroyed paddy land would be good for Surkhua farmers
148	Because of health issues people cannot work efficiently on the farms.
78	People don't have a proper education which limits job opportunities to earn enough income
79	Lack of business opportunities cause low incomes for buying food.

Figure 13: Go-Zone with Importance & Feasibility Mean Ratings for Seeds & Storage

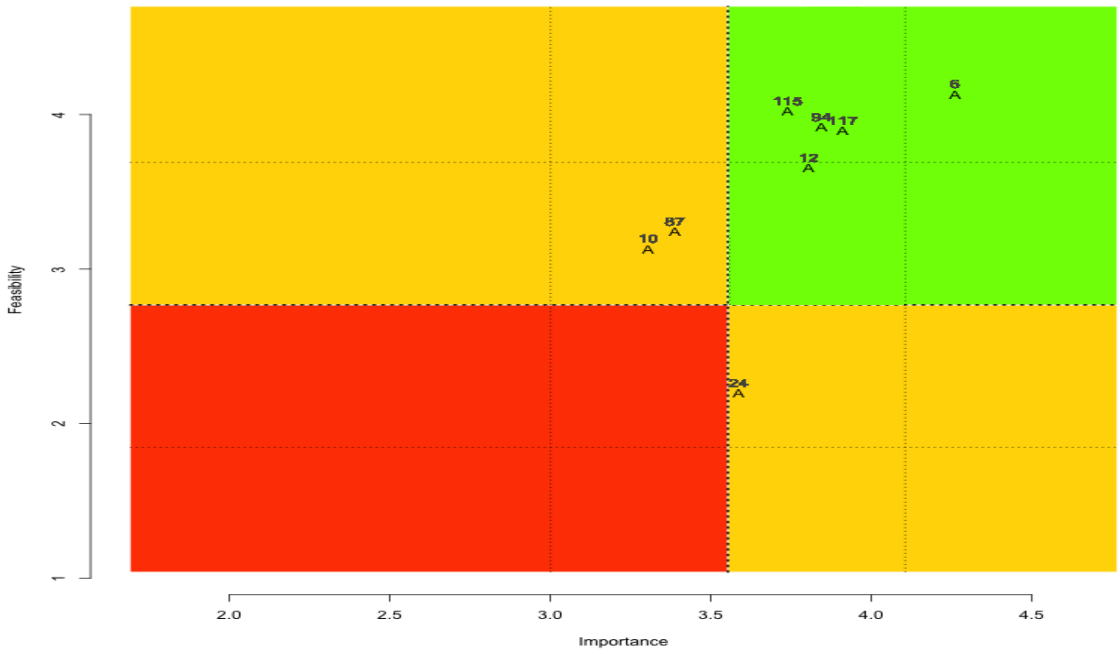


Table 5: GO-Zone Statements for the Cluster Seeds & Storage

ID	Statements
6	Poor access to quality seeds, in many villages
117	Poor storage facilities and perishability of vegetables
94	Farmers cannot access improved varieties of rice, corn and potato
12	Lack of storage facilities for harvested crops
115	Limited knowledge on livestock raising and crop cultivation
87	Farmers don't have storage facilities and they have nothing to sell when prices are high.
24	There are not enough farmers to produce food.
10	People do not have enough income to buy food.

Figure 14: Go-Zone with Importance & Feasibility Mean Ratings for Soil, Water, Land Issues

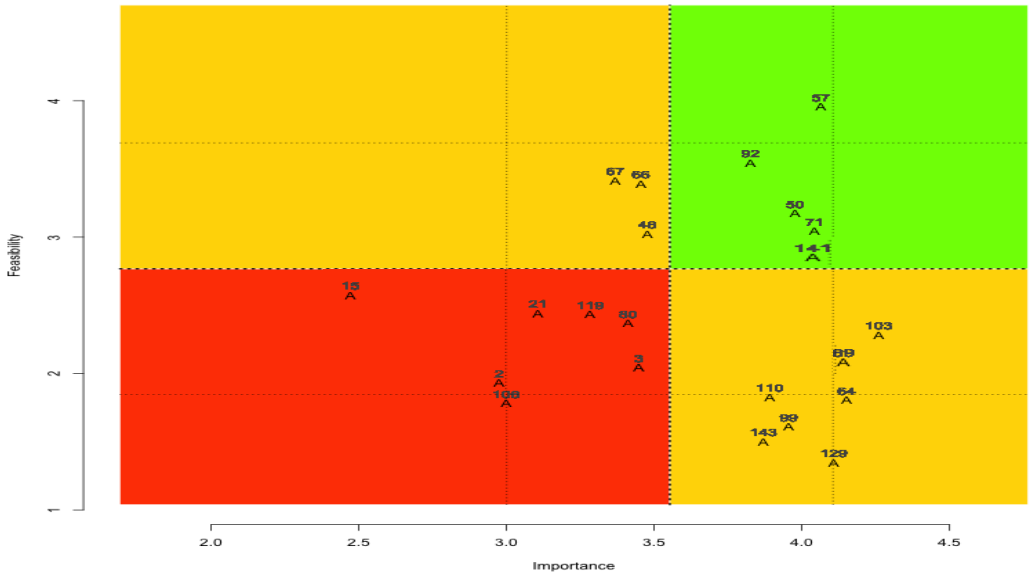


Table 6: GO-Zone Statements for the Cluster Soil, Water, Land Issues

ID	Statements
57	Bad soil and the lack of water leads to low yields
141	Deforestation and environmental degradation
71	Poor irrigation system for farming causes low yields of food crops
50	Deforestation causes poor soil conditions which lead to low yields
92	Crop production decreased due to the practice of shifting cultivation (slash & burn)
103	Scarcity of water for crop cultivation.
89	Due to Insufficient water and the lack of cattle and buffalos, terrace farming is difficult
64	Soil erosion and water insufficiency due to shifting cultivation leads to low crop yields.
129	There is not enough water for fishponds.
99	Limited land for paddy cultivation and banana.
110	Limited water after landslide disaster.
143	Due to limited agricultural land, people can't produce enough food.
48	Due to the short fallow period, the soil is poor or infertile causing low crop production.
66	Poor soil causes low crop production and low yields.
67	Due to infertile soil in backyard gardens, few crops are harvested
80	Agriculture lands are limited to produce enough food and to earn enough income
119	There are limited lands for crop cultivation.
108	Due to limited land there is no suitable farming land to produce food.
3	The steep landscape makes it difficult to find land to produce enough food.
21	Compared to central Myanmar, there is limited land available to grow crops
2	The land is too steep to grow cereal crops.
15	Soil quality is poor due to the short time period for keeping the land fallow.

Figure 15: Go-Zone with Importance & Feasibility Mean Ratings for Technology & Education

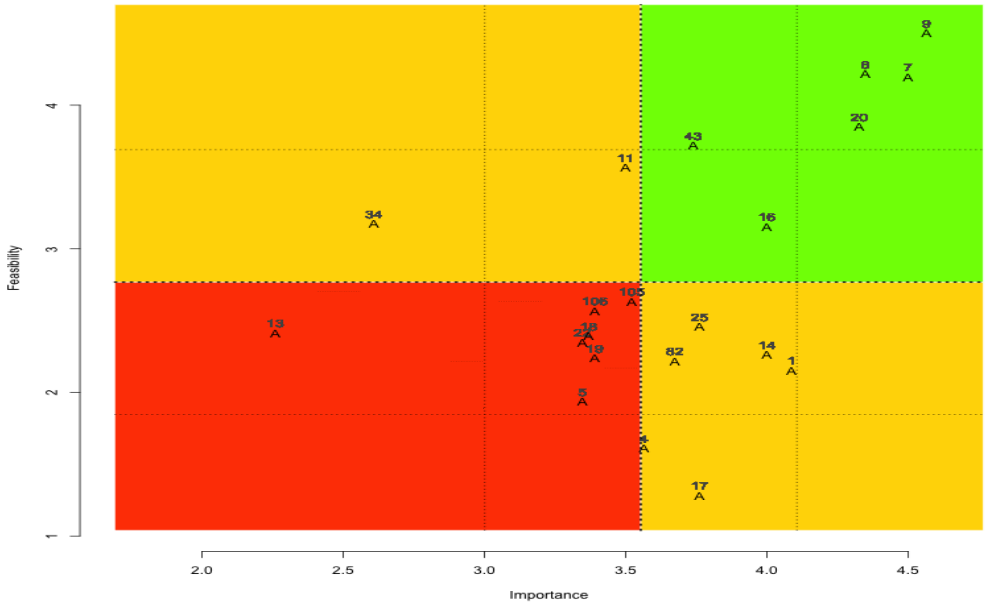


Table 7: Go-Zone Statements for the Cluster Technology & Education

ID	Statements
9	Farmers need education on improved growing practices
7	People do not have enough technical knowledge to produce enough food
8	Poor agricultural extension services at the village level
20	Crop yields are low due to the lack of technology
16	Most of the lands are infertile and too dry to grow crops
43	Lack of staff in LBVD office makes it hard to reach villages to provide vaccination
1	Poor soil conditions limit production of many crops
17	Crop yields have decreased due to irregular rain
25	Households could not get enough food from shifting cultivation
82	The land structure (geography) is not suitable for the cultivation of many crops.
4	Agriculture lands are destroyed by landslides
11	Poor soil does not allow farmers to produce enough food.
34	The land is limited to produce enough food for the growing population.
14	Due to high production cost and poor market access, people do not have enough income.
105	Very difficult to do fish farming.
19	The top soil is around 1 feet deep, there are many hard pan areas which affect crop growth.
18	Due to forest fire, soil is very dry and it is difficult to grow crops.
5	Food production and yield from shifting cultivation is low.
22	There is not enough land to grow cereal crops.
13	There is no year round food sufficiency through shifting cultivation.
106	People don't eat fish very often due to its expensive price.

Figure 16: Go-Zone with Importance & Feasibility Mean Ratings for Livestock, Insects & Pests

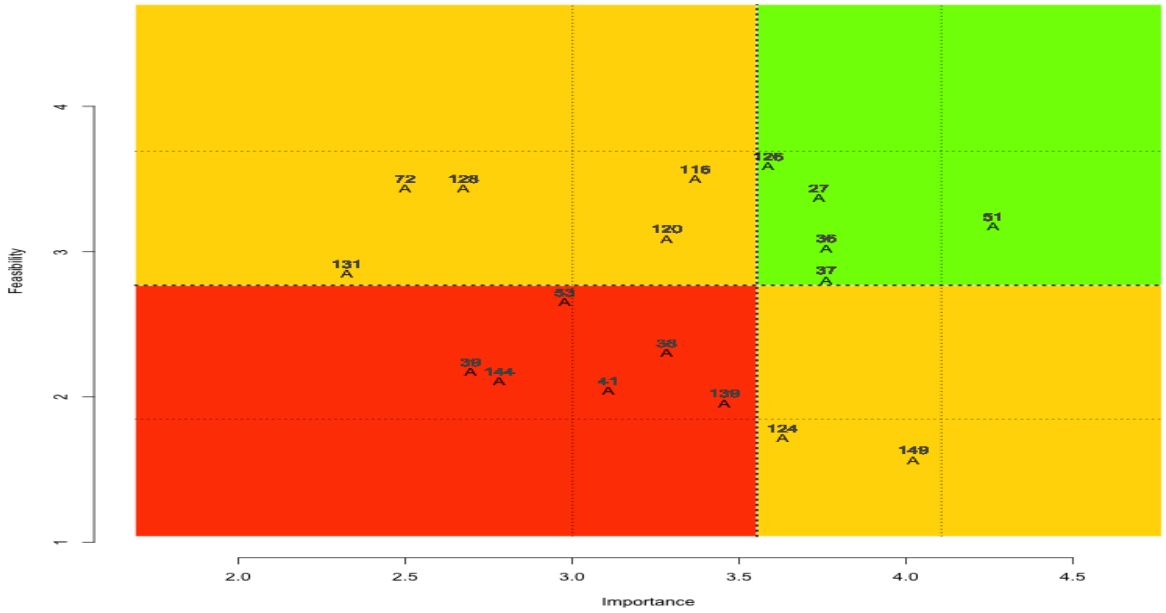


Table 8: GO-Zone Statements for the Cluster Livestock, Insects & Pests

ID	Statements
51	Lack of good seed and good breeds of livestock are main causes of low food production
36	Lack of livestock raising and animal feed shops in Hakha
37	Poor access to animal feed makes livestock raising in Chin State seem difficult
27	Due to plant diseases, farmers have less interest in high value crops production
126	Due to insect and pest infestations (strawberry, cabbage, potato) farmers got low yields
149	Livestock are dying from diseases and it is very difficult to reproduce them.
124	Due to outbreaks of animal disease, people couldn't raise animals properly
116	No access to animal feed such as pasture, pig & poultry feed, etc.
120	Livestock production is failing because of animal diseases.
128	Wild animals destroyed the farms, crops and plantations.
72	Livestock destroyed the crops.
131	Wild dogs and foxes kill chicken and pigs
139	Outbreaks of foot and mouth disease in cattle; blue ear disease in pigs and chicken flu create food insecurity
38	In Chin State, paddy cultivation is very limited which may impact on animal feed availability.
41	There are difficulties to use Artificial Insemination for accessing good livestock/strains
53	Rats and birds eat paddy and other crops.
144	Paddy fields are destroyed by wild boar, bears and eaten by rats and worms
39	Due to expensive labor there are few livestock (cows, goats, Mython) breeders in Chin State.

Figure 17: Go-Zone with Importance & Feasibility Mean Ratings for Market & Transport

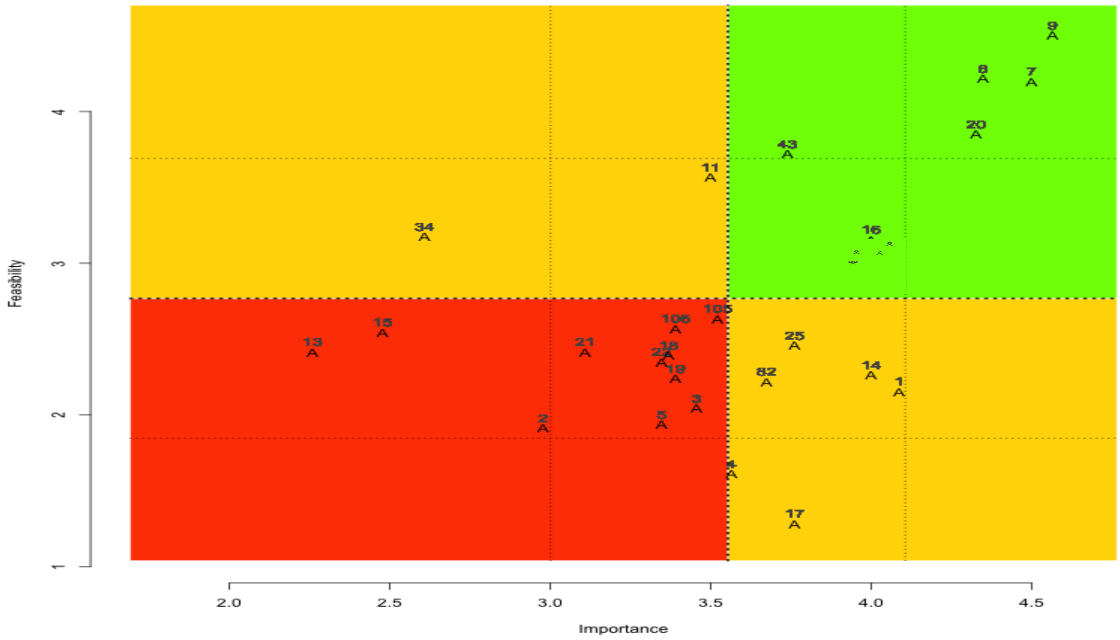


Table 9: GO-Zone Statements for the Cluster Market & Transport

ID	Statements
85	Due to poor access to market information people do not make enough money
75	Poor roads limit the transportation of food
26	People cannot access markets to buy or sell food
56	Poor roads cause people to earn low incomes from their products.
137	There are no traders and markets for agricultural products
147	Lack of business or trade opportunities due to bad roads and poor transportation.
33	The price of vegetables is high in Hakha, so people cannot afford to buy them.
73	There are no markets in the villages to sell and buy crops and food.
42	There are many difficulties with the transportation of livestock.
118	Farmers got a low price for vegetables in the village
100	Limited varieties of crops are grown due to bad weather.

Figure 18: Go-Zone with Importance & Feasibility Mean Ratings for Money Management

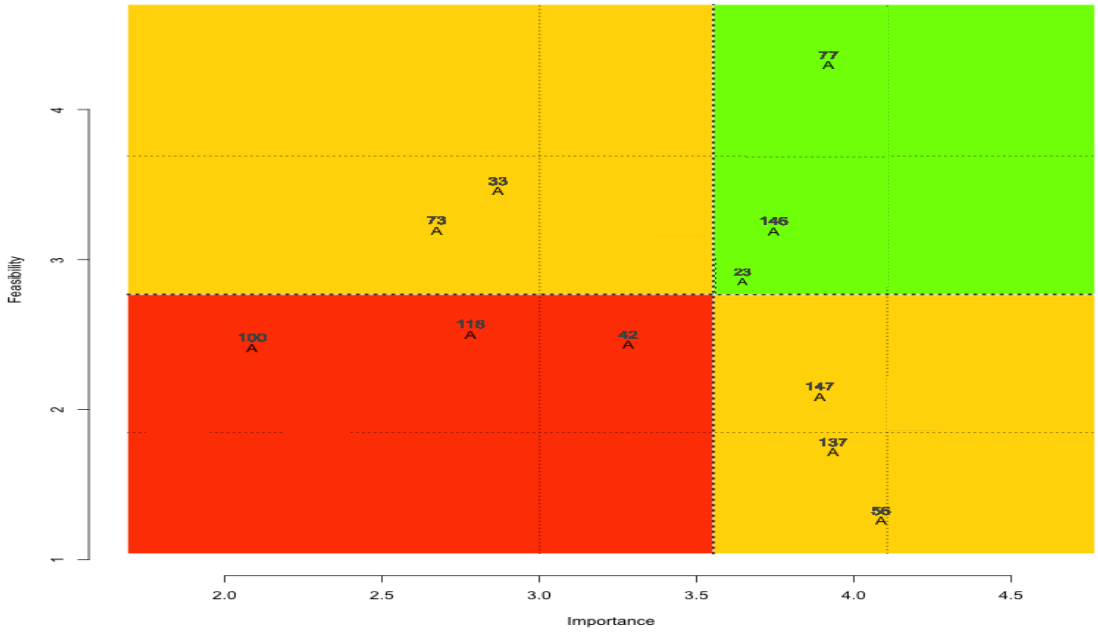


Table 10: Go-Zone Statements for the Cluster Money Management

ID	Statements
77	People lack knowledge on financial management which lead to food insufficiency
146	Lack of financial and food consumption management skills, results in people having inadequate food and money
69	Farmers need to borrow money to buy food before they harvest their crops
23	People spend more money than they earn and they end up in the debt cycle
62	Income from agriculture is low so people don't have enough money to buy food.
98	Lack of animals and cattle for farming operations.
130	Lack of capital for fish farming businesses.
47	Remittance money is not invested in farm businesses to produce enough food and to increase incomes.
49	There are too many people and not enough jobs, so people do not have enough money to buy food.
127	Young people migrate to urban area for education (families have to remit/ send money).
40	Household incomes are not enough to feed families
63	People do not have capital to expand agricultural land.
31	Many people depend on remittances and they have less interest in food production.
28	Lack of capital to expand crop cultivation.
150	People don't get enough income from weaving and so they can't afford to buy food for the family.
59	People do not have savings to buy food for the family.
138	The family size is big in many households and they don't have enough income.
55	Many families don't have enough income to buy food.
97	Due to increased debt and lack of capital, farmers could not keep their crops until they could get a high market price

Figure 19: Go-Zone with Importance & Feasibility Mean Ratings for Labor & Migration

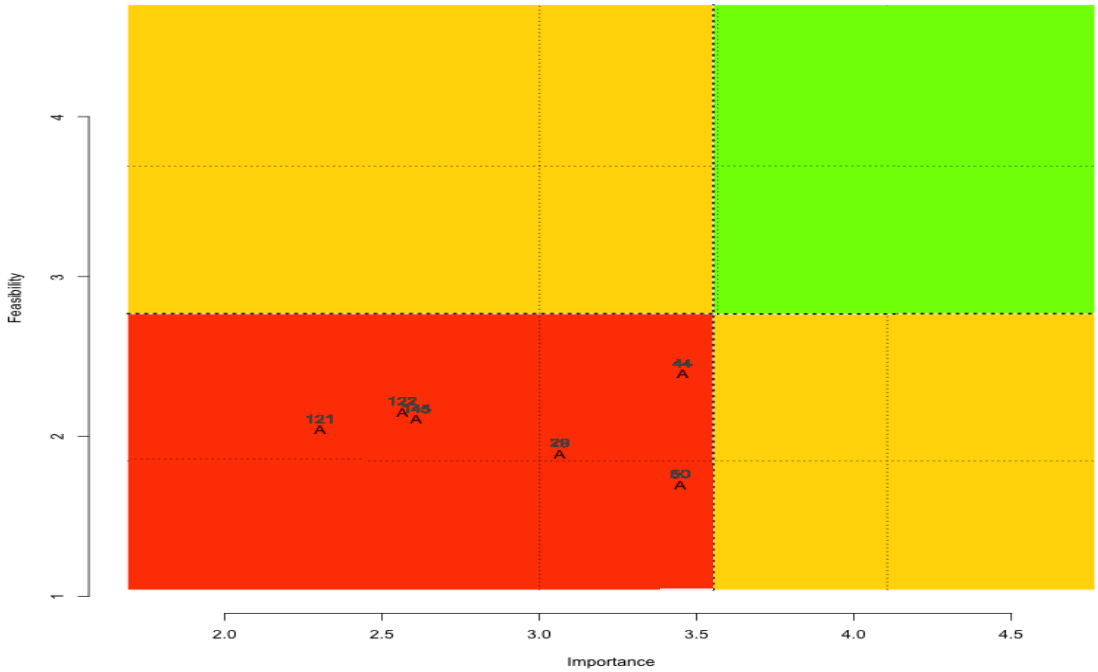


Table 11: GO-Zone Statements for the Cluster Labor & Migration

ID	Statements
88	Due to labor shortages, farmers could not produce enough crops.
44	Too much dependence on remittance money from abroad decreases labor in agriculture
60	Not enough labor for agricultural production, so there is not enough food.
29	Small-scale enterprises do not get government support
35	Migration of people from Chin State to other countries is high
145	There are few educated people in villages and less job opportunities to earn incomes
122	Parents couldn't afford to send their children to Hakha for studying.
121	Many households have more eaters and fewer workers.
96	There is not enough working labor at the household level.
46	The working hours per day are short, so production is low

Figure 20: Go-Zone with Importance & Feasibility Mean Ratings for Weather, Climate & Disaster.

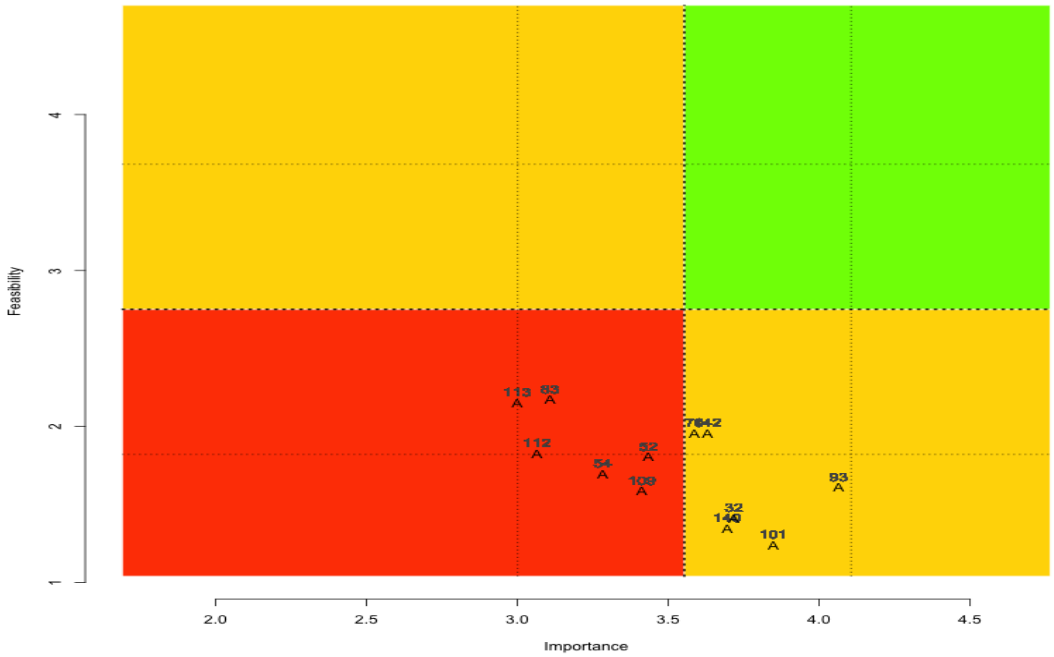


Table 12: GO-Zone Statements for the Cluster Weather, Climate & Disaster

ID	Statements
93	Due to Irregular rain and drought, farmers suffered from the loss of crops
101	Destruction of fishponds by land slides.
32	Extreme weather change results in fewer working days so people do not have enough money to buy food.
140	There are no more fish in the rivers and fishponds were damaged by landslides
142	People became landless due to landslides.
70	Climate change causes irregular crop growing patterns which can lead to low yields.
52	Natural disasters destroyed farmland in many villages.
109	Crop plantation and farming land are destroyed by natural disasters.
54	Climate change results in production loss.
83	Due to climate change, crop growing patterns are changing
112	Landslides affected livelihoods, houses were destroyed, and animals died.
113	Natural disasters such as landslides and floods destroyed crops and animals.
100	Limited varieties of crops can be grown due to bad weather.

6. Conclusion

In reviewing the Concept Maps generated by the participants including farmers, community members, representatives from government and non-governmental organizations, and UN organizations involved in food and nutrition related activities in Chin State, some common themes can be identified. Those can be summarized as follows:

Knowledge, Education, Technology & Information

The study shows that one of the main causes of people in rural Chin communities not having enough food, is limited or poor knowledge and information on food production (crops, livestock, fisheries), food distribution and marketing, and nutrition.

- Participants reported that farmers need knowledge and information on improved farming technologies, particularly upland agriculture, crop diversification, soil and water management, insect and pest control and management, seed production, post-harvest and value addition, and market information. Existing agricultural extension services provided by Department of Agriculture are very limited. Demand-driven agricultural extension education and advisory services are needed to address farmers needs and challenges.
- Farmers in the areas studies, grow monsoon rice, mostly in lowland, upland and terrace lands. Corn is the second most important crop amongst the cereals, which grows well in most upland areas. Terrace farming is common in Chin State and farmers are still reluctant to adopt modern agricultural technologies. DOA Agricultural officers reported that farmers are reluctant to adopt new technologies such as Sloping Agricultural Land Technology (SALT) and coffee production technology recently introduced by DOA, due to the high investment required.
- Farmers do not know what variety of pulses they are growing even though they have been growing pulses for long time. Mostly they grow cow pea, pigeon pea, garden pea, lablab bean, black eyed bean, winged bean, sulphur bean (Aungluk), and soybean.
- Farmers grow oil seeds crops such as groundnut, Chin sesame, sunflower, niger but they can not produce good yields and quality products due to weather, soil, water, seed and technology related issues.
- Various seasonal vegetables such as green bean, cabbage, carrot, chayote, bitter eggplant, bitter gourd, gourd/squash, garlic, ginger, mustard, onion, pumpkin, taro, yam/elephant foot yam, potato, sweet potato, tree tomato and roselle are grown in home gardens and in terrace farms where irrigation is available.
- Many farmers grow onion, garlic and mustard on the terrace lands during the winter season. A new crop, *Sacha inchi* (Kyae Pae) has become popular among farmers. Many farmers mentioned that they are interested to grow *Sacha inchi* in their home gardens but they need seed.

- Farmers from all of the 24 villages reported that they grow banana and avocado in their home gardens. Farmers from Nipi village grow strawberries on terrace land but could not produce quality strawberries due to lack of quality seed, water scarcity and poor irrigation, poor soil fertility and unpredictable weather. Some farmers grow grapes in their home gardens.
- Farmers from all 24 villages reported that they grow banana and avocado in their home gardens. Farmers from Nipi village grow strawberries on terrace land but could not produce quality strawberries due to the lack of quality seed, water scarcity and poor irrigation, poor soil fertility and unexpected weather changes. Some farmers grow grapes in their home garden.
- Both farmers and government officials from Department of Agriculture agree on the low returns from the slash and burn shifting cultivation, which is one of the traditional farming practices in Chin State. They also mentioned other issues such as deforestation and environmental degradation, unfertile soil and poor irrigation.
- Farmers reported that poor and infertile soils do not generate high crop yields for their household food security and income generation. In order to identify the quality of soil for different crop production, soil testing needs to be conducted in the project villages.
- Participants mentioned that crop production has decreased due to Insect and pest infestations. Farmers responded that they needed education and information on integrated pest management.

- **Fishery:** Participants responded that fishponds were sometimes destroyed by landslides; there are no more fish in the rivers; not enough water for fishponds; and no access to fingerlings. Among farmers from 24 villages only two farmers reported that they have small fishponds.

- **Livestock:** Farmers in the studied area raise chickens, pigs, cows, goats, buffalos, horses, and mython. Responses from farmers and government officials from Department of Livestock Breeding and Veterinary Department (LBVD) and Department of Rural Development suggest that farmers have difficulties with livestock raising and fish farming due to extreme weather changes, water scarcity, expensive labor, poor transportation, lack of access to animal feed, lack of access to good breeds, and disease outbreaks. Due to the lack of staff in the LBVD office, it is difficult to reach out to villages and provide vaccination services. Participants reported that farmers need extension education and advisory services on livestock breeding and fish farming.

- **Food & Nutrition:** Nutrition and health related responses were only received from village health workers and participants from the Department of Public Health. They mentioned that there is limited knowledge and information on good nutrition practices in rural Chin communities, including food diversity, food safety and good hygiene practices, breastfeeding, nutrition education for pregnant and lactating women, and infant and young child feeding practices.

Post Harvest Issues

The study shows that post harvest issues are seen as one of the main causes of food insecurity in rural Chin communities.

- **Storage facilities:** Farmers in the studied areas use traditional methods of seed production, particularly for corn, rice, potato and other vegetables. Some farmers have used the same variety of corn for up to 50 years. Poor storage facilities for seeds and harvested crops, result in low yield crops, lost quality and subsequent low incomes.
- **Market & Transport:** Farmers in the studied areas grow a variety of vegetables, fruits, oilseed crops and cereal as well as raising chickens, pigs and other livestock, for their family needs. However, there is no market to sell surplus produce and products in the villages and it is very difficult to travel to the market in Hakha due to poor transportation. Some farmers reported that they have to sell their crops such as corn and potato, immediately after harvest when the price is low, as they need money to buy food and cover other household needs.
- **Value-addition:** Participants reported that farmers and community members have limited knowledge on small-scale food processing for products such as dried fruits and vegetables, pickled vegetables, fruit juices, etc. If they have knowledge on food preservation they could have more food to feed the family during the off season.

Contextual issues

- **Labor and Migration:** Participants responded that many households in project villages have fewer workers and more eater as many young adults had migrated to urban areas and abroad for work, and only children and elderly people stay at home. Therefore, labor shortages are considered one of the main reasons for low food production.
- **Remittance:** Participants responded that many households in project villages depend on remittance money and are not interested in producing their own food.
- **Money management:** Participants stated that many farmers and community members have limited knowledge of money management, which results in food insufficiency. This includes lack of access to capital; and limited knowledge on how to manage money in ways that can support a diverse and long-term healthy diet. As a consequence they need to borrow money to buy food in the pre-harvest period. Many households spend more money than they earn and so end up in a spiraling debt cycle.
- **Crop season**: Participants reported that there is a limited time period for crop production. They can grow crops successfully for only 4 months a year. Therefore many households do not produce enough food for the whole year.

7. Recommendations

The Concept Mapping research study suggests that in order to increase the availability and accessibility of food for households in the project villages, farmers need to know more about improved food production, post-harvest handling and processing technologies. In terms of food utilization, farmers and community members have poor and limited knowledge on nutrition, dietary diversity, food safety and good hygiene practices. Providing education and advisory services to farmers is vitally important. As was found by the exercise, statements related to knowledge, education, technology and information were rated 'very high' in both importance and feasibility. Nutrition Sensitive Agriculture approaches should be introduced and implemented to address farmer needs and challenges. Based on the research findings from the Concept Mapping study the following recommendations are made.

Introducing Nutrition Sensitive Agriculture (NSA): Nutrition sensitive agriculture is a food-based approach to agricultural development that puts production of nutritionally rich food, dietary diversity, and food fortification at the heart of overcoming malnutrition and micronutrient deficiencies. This approach stresses the multiple benefits derived from enjoying a variety of foods, recognizing the nutritional value of food for good nutrition, and the importance and social significance of the food and agricultural sector for supporting rural livelihoods. The overall objective of nutrition-sensitive agriculture is to make the local food system better equipped to produce good nutritional outcomes.

Nutrition sensitive agricultural production can be implemented in three main areas:

- *Making food more available and accessible.* Increasing agricultural production makes food more available and affordable, which can improve both the health and the economic status of the community. Sustained income growth in turn has a sizeable effect on reducing malnutrition.
- *Making food more diverse and production more sustainable.* Increasing diversity in food production and promoting sustainable production practices like conservation agriculture, water management and integrated pest management can improve nutrition levels without depleting natural resources. Family farming, home gardens and homestead food production projects can make a wider variety of crops available at the local level.
- *Making food itself more nutritious.* Fortification of food and crops can prevent micronutrient deficiencies by enhancing their micronutrient content through processing, plant breeding and improved soil fertility.

In addition to changes in the agriculture sector, government can promote Nutrition Sensitive Agriculture by incorporating key concepts into current policies and programs. Recently, international development partners have implemented several food security and nutrition related initiatives in Chin State, in collaboration with civil society and government organizations

including the Department of Agriculture, Department of Public Health, Department of Education and others. However, collaboration and cooperation amongst the organizations and agencies remain weak and farmers and rural community members still need knowledge and information on upland agriculture and farming systems including crops, fisheries and livestock, farm business management and household nutrition, to improve their livelihoods, and food and nutrition security.

This study offers recommendations for agricultural training, extension and research needs for agricultural training institutions and the Department of Agriculture. Yezin Agricultural University and State Agricultural Institutes across Myanmar, should introduce several new courses including 'Upland Agriculture & Farming Systems', 'Nutrition Sensitive Agricultural Extension' and 'Food & Nutrition Education' into the existing curriculum.

The following are recommendations for; research and training needs; what topics should be taught; who should be trained; where and how training should be conducted. It is recommended that training and research activities should be conducted by MIID and Cornell University in collaboration with Chin State Department of Agriculture, Lungpi State Agricultural Institute and Yezin Agricultural University.

Agriculture Training Institutions:

- **WHAT:** New courses on Upland Agriculture, Nutrition Sensitive Agricultural Extension, and Food and Nutrition Education.
- **WHO:** Teachers and students from State Agricultural Institute, Agricultural University.
- **WHERE:** Yezin Agricultural University, Lungpi State Agricultural Institute.
- **HOW:** Lecture, Seminar, Research and Extension Activities.

Training of Trainers (TOT):

- **WHAT**: Upland Agriculture, Nutrition Sensitive Agricultural Extension, Food & Nutrition Education, Integrating Gender & Nutrition within Agricultural Extension Services.
- **WHO**: MIID staff, representatives from government and non-government organizations.
- **WHERE:** Hakha, Chin State.
- **HOW:** Training, Hands-on workshop, Research & Extension Activities, provision of educational materials

Training of Facilitators (TOF):

- **WHAT:** Upland crop production, crop diversification, seed production, soil & water management, soil sampling/testing/identification, integrated pest management, post-harvest handling & storage, good nutrition practices, cooking demonstration.
- **WHO:** MIID-Hakha staff and Village Leaders (Men & Women).
- **WHERE:** MIID-Hakha office, and collaboration with DOA-Hakha.
- **HOW:** Training, hands-on workshops, field experiments, provision of educational materials.

Farmer Field School (FFS):

- **WHAT:** Upland crop production, seed production, soil sampling/testing/identification, soil & water management, compost making, integrated pest management, post-harvest & storage, home gardening, good nutrition practices, cooking demonstration.
- **WHO:** Farmers, Community Members (Men and Women)
- **WHERE:** MIID-Farmer Field Schools
- **HOW:** Hands-on workshop, field experiment, provide educational materials.

Research Needs

- Analysing soil and water requirements for different crops, particularly high-value and nutrient dense crops, for improving upland agriculture and farming systems.
- Yield trials for corn and potato (traditional and improved varieties).
- Linking smallholder farmers with markets through supply chain/value chain approaches (corn, potato value chain assessment).
- Needs and opportunities for the nutrition sensitive agricultural extension approach
- Farmer awareness on good nutrition, dietary diversity, Young Child Feeding Practices.
- Farmer perceptions on establishing farmer groups/ organizations/association (sharing knowledge, improving farm business management, collectively buying and selling agriculture & food products, and finding niche markets for smallholder farmers).
- Farmer adoption of new technologies and extension & advisory services.
- Impact assessments of youth migration, on food and nutrition security.
- Impact analysis of good nutrition practices and Young Child Feeding Practices.
- Farmer Field School participant behavior changes, for crop production, food preparation, food consumption, sanitation and hygiene practices.

APPENDIX- A

Table 1: Demographic and supporting Information from the Project Villages that participated in Concept Mapping Study

	Village Name	Distance (Miles)	House-holds #	Population			Crops grown	Animals raised
				Female	Male	Total		
1	Aive	12	35	77	75	152	Rice, corn, cabbage, garlic, onion, elephant foot yam, mustard, pumpkin, banana, grape, lime	Cow, poultry, fishpond (1)
2	Bualtak	9	39	142	104	246	Rice, corn, bitter eggplant, chili, chayote, cucumber, pumpkin, roselle, string bean, soybean, tree tomato, banana, orange	Buffalo, cow, goat, horse, pig, poultry
3	Buanlung	27	167	495	427	922	Rice, corn, cabbage, bitter eggplant, cucumber, garlic, mustard, onion, roselle, potato, pumpkin, sweet potato, sesame, sugarcane, tree tomato	Buffalo, cow, horse
4	Bungtuah	43	51	136	130	266	Rice, corn, green beans, onion, garlic, mustard, lime, potato, pumpkin, tree tomato, banana	Buffalo, cow, pig, poultry
5	Bungzung	64	200	390	396	786	Rice, corn, cabbage, bean, bitter eggplant, garlic, chayote, onion, potato, pumpkin, tree tomato	Buffalo, cow, poultry
6	Chinkhua	14	89	193	202	395	Rice, corn, chayote, bean, bitter eggplant, garlic, mustard, pumpkin, sweet potato, banana	Buffalo, cow, pig, poultry
7	Choncum	84	100	252	218	470	Rice, corn, cabbage, chayote, bitter eggplant, Sacha Inchi (Kyae Pae)	Buffalo, cow, pig, poultry
8	ChunCung	15	347	908	783	1691	Rice, corn, cabbage, chickpea, bitter eggplant, garlic, ginger, mustard, potato, onion, tomato, avocado, banana, pineapple	Buffalo, cow, pig, mython
9	Hniarlawn	8	170	379	325	704	Rice, corn, cabbage, carrot, chayote, bean, garlic, mustard, onion, potato, pumpkin, banana	Buffalo, cow, horse
10	Keizuan	82	34	67	76	143	Rice, corn, beans, bitter eggplant, mustard, potato, pumpkin, tree tomato, banana	Buffalo, cow, poultry
11	Leium A	62	63	143	149	292	Rice, corn, beans, chayote, elephant foot yam, sweet potato, banana, mango	Buffalo, cow, pig, poultry

	Village Name	Distance (Miles)	House-holds #	Population			Crops grown	Animal raised
				Female	Male	Total		
12	Leium B	57	54	110	108	218	Rice, corn, bitter eggplant, garlic, mustard, roselle, sesame, tamarind, banana, mango, papaya	Buffalo, cow, pig, poultry
13	Lichia	16	44	109	124	233	Rice, cabbage, chayote, corn, bean, bitter eggplant, yam, ginger, garlic, mustard, potato, pumpkin, sesame, tree tomato, banana	Buffalo, cow
14	Loklung	9	160	381	383	764	Rice, corn, cabbage, carrot, chayote, garlic, mustard, onion, tomato, potato, pumpkin, grapes	Buffalo, cow, pig, poultry, fish
15	LungRang	67	178	433	526	959	Rice, corn, cabbage, chayote, green beans, peas, lettuce, mustard, potato, pumpkin, tree tomato	Buffalo, cow, horse, mython, pig, poultry
16	NaBual	9	53	99	91	190	Rice, corn, bean, pumpkin, mustard, onion, tree tomato, banana, grapes, guava, pear, papaya	Buffalo, cow, horse
17	Nipi	7	34	72	67	139	Rice, corn, cabbage, chayote, garlic, mustard, onion, potato, tomato, avocado, lime, strawberry	Cow, poultry
18	Phaizawng	66	105	344	390	734	Rice, corn, chayote, millet, pumpkin, potato, sulphur bean (Aung Lauk Pae), tree tomato	Buffalo, cow, pig, poultry
19	Phaipha A	42	40	89	96	185	Rice, cabbage, corn, cucumber, mustard, onion, potato, pumpkin, sweet potato, sesame, roselle	Buffalo, cow
20	Phaipha B	38	63	173	153	326	Rice, corn, cabbage, chayote, mustard, pumpkin, sweet potato, tree tomato, yam, banana	Buffalo, cow, poultry
21	Surkhua	51	248	631	534	1165	Rice, corn, chayote, mustard, potato, pumpkin, sesame, tree tomato	Buffalo, cow, poultry
22	Ti Phul	16	156	247	223	470	Rice, corn, cilantro/coriander, chayote, mustard, potato, pumpkin, tree tomato, sweet potato	Cow, pig, mython
23	ZaThal	22	87	233	199	432	Rice, corn, cabbage, chayote, garlic, lettuce, mustard, potato, pumpkin, tree tomato	Buffalo, cow, pig
24	Zokhua	22	162	360	354	714	Rice, corn, cabbage, chayote, garlic, onion, mustard, pumpkin, banana, lime, mango, pear	Buffalo, cow, pig, poultry

Source: Adapted from Government Administration Department (GAD)-Hakha's data and Concept Mapping field research data

Table 2: Representatives from Villages participated in Concept Mapping Brainstorming

	Village Name	Women	Farmers (Male)	Midwife	Teacher	Village Admin	Health Worker	Church Leader	Total
1	Aive	5	5	1	1	2	1		**15**
2	Bualtak	6	5	1	2	1	1		**16**
3	Buanlung	6	6	1	-	1	-		**14**
4	Bungtuah	5	5	1	1	1	-		**13**
5	Bungzung	5	5	1	1	2	-		**14**
6	Chinkhua	5	5	2	1	1	-		**14**
7	Choncum	5	5	-	1	1	-		**12**
8	ChunCung	5	5	1	1	1	-		**13**
9	Hniarlawn	5	5	1	1	2	-		**14**
10	Keizuan	5	5	-	1	2	-	1	**14**
11	Leium A	6	7	-	1	1	-		**15**
12	Leium B	6	6	-	1	1	-		**14**
13	Lichia	5	9	-	1	1	-		**16**
14	Loklung	5	7	1	5	2	-		**20**
15	LungRang	6	6	-	1	1	1		**15**
16	NaBual	5	5	-	1	2	-		**13**
17	Nipi	6	7						**13**
18	Phaizawng	5	7	-	1	1	1		**15**
19	Phaipha A	6	6						**12**
20	Phaipha B	6	3	-	1	1	1		**12**
21	Surkhua	7	5	1	2	1	-		**16**
22	Ti Phul	6	6	-	3	1	-		**16**
23	ZaThal	6	6	-	1	2	-	1	**16**
24	Zokhua	5	5	1	1	2	-		**14**
	TOTAL	**132**	**136**	**12**	**29**	**30**	**5**	**2**	**346**

Table 3: Representatives from Organizations participated in Concept Mapping Brainstorming

Organization	Position	Sex	Age	Work Experience in Chin (Year)
1. Department of Agriculture (DOA)	Director	M	59	12
2. Department of Rural Development (DRD)	Deputy Director	M	60	20
3. Government Administration Department (GAD)	Director (GAD Admin)	M	-	1
4. Livestock Breeding and Veterinary Department (LBVD)	Director	M	60	2
5. National Race and Border Affairs Development (Na-ta-la)	Staff Officer	M	38	13
6. Social Development Department	Director	M	56	31
7. Relief and Resettlement Department	Director	M	47	1
8. Cooperative Department	Staff Officer	M	53	43
9. Disable Group	Officer	F	46	3
10. Chin Women Organization (CWO)	Chairman	F	62	2
11. Health Concern Volunteer Group	State School Health Lead	M	33	7
12. Country Agency for Rural Development (CAD)	Program Officer	M	35	2.5
13. Chin Association for Christian Communication (CACC)	General Secretary	M	54	30
14. World Food Program (WFP)	Program Assistant	M	54	1
15. UNICEF	Education Officer	M	59	4
16. UNDP	Area Coordinator	M	36	6
17. World Health Organization (WHO)	Coordinator	M	46	3

4. Photos: Concept Mapping Workshop held in Hakha City on January 30, 2017: Representatives from 24 Villages: Farmers, Community Members, Village Head/Administrative Committee Chairs and Members are focusing on Sorting and Ratings!

Photos: Concept Mapping Workshop held in Hakha City on January 30, 2017: Representatives from Government Organizations, NGOs, CBOs, CSOs and UN Organizations are focusing on Sorting and Ratings!

Concept Mapping Workshop Participants Attending MIID/Cornell LIFT Project Launch held in Hakha City, Chin State on January 31, 2017

Table 5: List of Statements in the Cluster 'Knowledge & Information' with Mean Ratings

Statements in Cluster with their ID Number *** Go-Zone Statements rated above the mean in both Importance & Feasibility*		Mean Rating Value	
		Imp.	Fesb.
ID	**Cluster: Knowledge & Information**		
111	Limited agricultural knowledge on modern farming**	4.37	4.28
123	Lack of education on food and nutrition in the communities**	4.33	4.39
58	Lack of knowledge on upland agriculture leads to low yield **	4.28	4.37
104	Limited awareness on food and nutrition information, such as Elephant Foot Yam**	4.28	4.35
107	Lack of knowledge on soil management **	4.26	4.28
81	Lack of knowledge and education about agriculture and farming systems **	4.22	4.50
95	No access to improved farming technology **	4.22	4.35
68	Poor 'Good Agricultural Practices' (GAP) lead to low yields **	4.20	4.15
91	People spend money on unhealthy food instead of fresh food **	4.20	4.28
61	Not enough food is produced due to the lack of agricultural knowledge **	4.15	4.37
125	Lack of knowledge on agriculture and livestock farming **	4.11	3.98
136	Pregnant women suffer from malnutrition due to poor food consumption**	4.11	3.78
102	Destruction of forests by the people*	4.09	3.28
90	Farmers did not apply the required fertilizers to get good crop yields**	4.04	3.83
74	Food production was low due to the lack of application of fertilizers **	4.02	4.26
134	Malnutrition and vitamin deficiency were found in primary school students **	4.00	4.30
76	People do not have access to a diverse diet **	3.93	4.28
86	People are not interested in growing their own food*	3.93	3.22
84	Crop yields are low due to poor agricultural practices **	3.87	4.02
65	Farmers grow few seasonal crops and the working season is short (4/12 months)*	3.76	3.83
45	Lack of a seasonal crop calendar and agricultural knowledge, so people do not know when to grow crops*	3.72	4.04
132	Corn, bean and Chin sesame are mostly grown in shifting cultivation but give low yields	3.57	3.22
114	Cabbages are being destroyed by worms and farmers got very low yields	3.54	3.63
30	Farmers do not grow high value crops so do not have enough money to buy food.	3.39	3.57
135	Lack of food causes malnutrition in Chin State	3.37	2.89
148	Because of health issues people cannot work efficiently on the farms.	3.09	2.11
133	Substitute sunflower production on destroyed paddy land would be good for Surkhua farmers	3.07	3.50
78	People don't have a proper education which limits job opportunities to earn enough income	3.02	2.11
79	Lack of business opportunities causes low incomes to buy food	2.39	2.11
		3.85	**3.77**

Table 6: List of Statements in the Cluster 'Seeds & Storage' with Mean Ratings

Statements in Cluster with their ID Number *** Go-Zone Statements rated above the mean in both Importance & Feasibility*		Mean Rating Value	
		Imp.	Fesb.
ID	**Cluster: Seeds & Storage**		
6	Poor access to quality seeds in many villages**	4.26	4.13
117	Poor storage facilities and perishability of vegetables**	3.96	3.89
94	Farmers cannot access improved varieties of rice, corn and potato**	3.89	3.91
12	Lack of storage facilities for harvested crops**	3.80	3.65
115	Limited knowledge on livestock raising and crop cultivation**	3.74	4.02
87	Farmers don't have storage facilities and they have nothing to sell when prices are high.	3.39	3.24
24	There are not enough farmers to produce food	3.59	2.20
10	People do not have enough income to buy food	3.30	3.13
		3.72	**3.33**

Table 7: List of Statements in the Cluster 'Soil, Water, Land Issues' with Mean Ratings

Statements in Cluster with their ID Number *** Go-Zone Statements rated above the mean in both Importance & Feasibility*		Mean Rating Value	
		Imp.	Fesb.
ID	**Cluster: Soil, Water, Land Issues**		
103	Scarcity of water for crop cultivation	4.26	2.28
64	Soil erosion and water insufficiency due to shifting cultivation leads to low crop yield.	4.15	1.80
89	Due to insufficient water and the lack of cattle and buffalos, terrace farming is difficult	4.13	2.07
129	There is not enough water for fishponds.	4.11	1.35
57	Bad soil and the lack of water leads to low yields **	4.07	3.96
141	Deforestation and environmental degradation **	4.07	2.91
71	Poor irrigation system for farming causes low yields of food crops **	4.04	3.04
50	Deforestation causes poor soil conditions which lead to low yields **	3.98	3.17
99	Limited land for paddy cultivation and banana.	3.96	1.61
110	Limited water after landslide disaster.	3.89	1.83
143	Due to limited agricultural land, people can't produce enough food.	3.87	1.50
92	Crop production decreased due to the practice of shifting cultivation (slash & burn) **	3.83	3.54
48	Due to the short fallow period, the soil is poor or infertile causing low crop production	3.48	3.02
66	Poor soil causes low crop production and low yields.	3.46	3.39
3	The steep landscape makes it difficult to find land to produce enough food	3.46	2.04
80	Agriculture lands are limited to produce enough food and to earn enough income	3.41	2.37
67	Due to infertile soil in backyard gardens few crops are harvested	3.37	3.41
119	There are limited lands for crop cultivation.	3.28	2.43
21	Compared to central Myanmar, there is limited land available to grow crops	3.11	2.41
108	Due to limited land there is no suitable farming land to produce food.	3.00	1.78
2	The land is too steep to grow cereal crops.	2.98	1.91
15	Soil quality is poor due to the short time period for keeping the land fallow.	2.48	2.54
		3.76	**2.71**

Table 8: List of Statements in the Cluster 'Technology & Education' with Mean Ratings

Statements in Cluster with their ID Number *** Go-Zone Statements rated above the mean in both Importance & Feasibility*		Mean Rating Value	
		Imp.	Fesb.
ID	**Cluster: Technology & Education**		
9	Farmers need education on improved growing practices **	4.57	4.50
7	People do not have technical knowledge to produce enough food **	4.50	4.20
8	Poor agricultural extension services at the village level **	4.35	4.22
20	Crop yields are low due to the lack of technology **	4.33	3.85
1	Poor soil conditions limit production of many crops.	4.09	2.15
16	Most of the land is infertile and too dry to grow crops **	4.00	3.15
14	Due to high production costs and poor market access, people do not have enough income.	4.00	2.26
17	Crop yields decreased due to irregular rain.	3.76	1.28
25	Households could not get enough food from shifting cultivation.	3.76	2.46
43	Lack of staff in LBVD office makes it hard to reach villages to provide vaccination **	3.74	3.72
82	The land structure (geography) is not suitable for the cultivation of many crops	3.67	2.22
4	Agriculture lands are destroyed by landslides	3.57	1.61
105	Very difficult to do fish farming.	3.52	2.63
11	Poor soil does not allow farmers to produce enough food **	3.50	3.57
19	The top soil is around 1 feet deep, there are many hard pan areas that affect crop growth.	3.39	2.24
106	People don't eat fish very often, due to its expensive price.	3.39	2.57
18	Due to forest fires, soil is very dry and it is difficult to grow crops.	3.37	2.39
5	Food production and yields from shifting cultivation are low	3.35	1.93
22	Not enough land to grow cereal crops.	3.35	2.35
34	The land is insufficient to produce enough food for the growing population.	2.61	3.17
13	There is no year round food sufficiency through shifting cultivation	2.26	2.41
		3.56	**2.71**

Table 9: List of Statements in the Cluster 'Livestock, Insects & Pests' with Mean Ratings

Statements in Cluster with their ID Number *** Go-Zone Statements rated above the mean in both Importance & Feasibility*		Mean Rating Value	
		Imp.	Fesb.
ID	**Cluster: Livestock, Insects & Pests**		
51	Lack of good seeds and good breeds of livestock are the main causes of low food production**	4.26	3.17
149	Livestock are dying from diseases and it is difficult to reproduce them.	4.02	1.57
36	Lack of livestock raising and animal feed shops in Hakha **	3.76	3.02
37	Poor access to animal feed makes livestock raising in Chin State seem difficult*	3.76	2.80
27	Due to plant diseases, farmers have less interest in high value crops production**	3.74	3.37
124	Due to outbreaks of animal disease, people couldn't raise animals properly	3.63	1.72
126	Due to insect and pest infestations (strawberry/cabbage/potato) farmers got low yields **	3.59	3.59
139	Outbreaks of foot and mouth disease in cattle, blue ear disease in pigs and chicken flue create food insecurity	3.46	1.96
116	No access to animal feeds such as pasture, pig & poultry feed, etc.**	3.37	3.50
38	In Chin State, paddy cultivation is very limited, which may impact on animal feed availability	3.28	2.30
120	Livestock production is failing because of animal diseases.	3.28	3.09
41	There are difficulties in using Artificial Insemination for accessing good livestock/strains	3.11	2.04
53	Rats and birds eat paddy and other crops.	2.98	2.65
144	Paddy fields are destroyed by wild boar, bears and eaten by rats and worms	2.78	2.11
39	Due to expensive labor there are few livestock (cows, goats, Mython) breeders in Chin State.	2.70	2.17
128	Wild animals destroyed the farms, crops and plantations.	2.67	3.43
72	Livestock destroyed the crops.	2.50	3.43
131	Wild dogs and foxes kill chickens and pigs	2.33	2.85
		3.29	**2.71**

Table 10: List of Statements in the Cluster 'Market & Transport' with Mean Ratings

Statements in Cluster with their ID Number *** Go-Zone Statements rated above the mean in both Importance & Feasibility*		Mean Rating Value	
		Imp.	Fesb.
ID	**Cluster: Market & Transport**		
56	Poor roads cause people to earn low incomes from their products	4.09	1.26
85	Due to poor access to market information people do not make enough money **	4.04	3.30
75	Poor roads limit the transportation of food **	4.02	3.35
137	There are no traders and markets for agricultural products	3.93	1.72
147	Lack of business or trade opportunities due to bad roads and poor transportation.	3.89	2.09
26	People cannot access markets to buy or sell food **	3.72	3.02
42	There are many difficulties with the transportation of livestock.	3.28	2.43
33	The price of vegetables is high in Hakha so people cannot afford to buy them.	2.87	3.46
118	Farmers got a low price for vegetables in the village	2.78	2.50
73	There are no markets in the villages to sell and buy crops and food.	2.67	3.20
100	Limited varieties of crops can be grown due to bad weather.	2.09	2.41
		3.45	**2.64**

Table 11: List of Statements in the Cluster 'Money Management' with Mean Ratings

Statements in Cluster with their ID Number *** Go-Zone Statements rated above the mean in both Importance & Feasibility*		Mean Rating Value	
		Imp.	Fesb.
ID	**Cluster: Money Management**		
62	Income from agriculture is low so people don't have enough money to buy food.	4.07	2.09
77	People lack knowledge on financial management which lead to food insufficiency**	3.91	4.30
98	Lack of animals and cattle for farming operations.	3.89	1.37
130	Lack of capital for fish farming businesses.	3.87	1.52
47	Remittance money is not invested in farm businesses to produce enough food and to increase incomes.	3.85	2.09
49	There are too many people and not enough jobs, so people do not have enough money to buy food.	3.83	2.35
127	Young people migrate to urban area for education (families have to remit/ send money)	3.78	1.52
40	Household Incomes are not enough to feed families	3.76	2.41
146	Lack of financial and food consumption management skills, results in people having inadequate food and money**	3.74	3.20
23	People spend more money than they earn and they end up in the debt cycle**	3.65	2.87
69	Farmers need to borrow money to buy food before they harvest their crops**	3.61	3.54
31	Many people depend on remittances and they have less interest in food production.	3.57	1.63
28	Lack of capital to expand crop cultivation.	3.35	2.48
63	People do not have capital to expand agricultural land.	3.33	3.02
150	People don't get enough incomes from weaving and so they can't afford to buy food for the family	3.26	1.67
59	People do not have savings to buy food for the family.	3.24	2.09
138	The family size is big in many households and they don't have enough income.	3.15	1.87
55	Many families don't have enough income to buy food.	3.13	2.33
97	Due to increased debt and lack of capital, farmers could not keep their crops until they could get a high market price	2.57	1.76
		3.38	**2.11**

Table 12: List of Statements in the Cluster 'Labor & Migration' with Mean Ratings

Statements in Cluster with their ID Number *** Go-Zone Statements rated above the mean in both Importance & Feasibility*		Mean Rating Value	
		Imp.	Fesb.
ID	**Cluster: Labor & Migration**		
88	Due to labor shortages, farmers could not produce enough crops.	3.65	1.50
44	Too much dependence on remittance money from abroad decreases labor in agriculture	3.46	2.39
60	Not enough labor for agricultural production, so there is not enough food.	3.43	1.70
29	Small-scale enterprises do not get government support	3.07	1.89
35	Migration of people from Chin State to other countries is high.	2.78	2.15
145	There are few educated people in villages and less job opportunities to earn incomes	2.61	2.11
122	Parents couldn't afford to send their children to Hakha for studying.	2.57	2.15
121	Many households have more eaters and fewer workers.	2.30	2.04
96	There is not enough working labor at the household level.	2.33	1.83
46	The working hours per day are short, so production is low	1.89	1.85
		3.09	**2.58**

Table 13: List of Statements in the Cluster 'Weather, Climate & Disaster' with Mean Ratings

Statements in Cluster with their ID Number *** Go-Zone Statements rated above the mean in both Importance & Feasibility*		Mean Rating Value	
		Imp.	Fesb.
ID	**Cluster: Weather, Climate, Disaster**		
93	Due to irregular rain and drought, farmers suffered from the loss of crops	4.07	1.61
101	Destruction of fishponds by land slides.	3.85	1.24
32	Extreme weather changes result in fewer working days so people do not have enough money to buy food.	3.72	1.41
140	There are no more fish in the rivers and fishponds were damaged by landslides.	3.70	1.35
142	People became landless due to landslides.	3.63	1.96
70	Climate change causes irregular crop growing patterns which can lead to low yields.	3.59	1.96
52	Natural disasters destroyed farmland in many villages.	3.43	1.80
109	Crop plantation and farming land are destroyed by natural disasters.	3.41	1.59
54	Climate change results in production loss.	3.28	1.70
83	Due to climate change, crop growing patterns are changing	3.11	2.17
112	Landslides affected livelihoods, houses were destroyed, and animals died.	3.07	1.83
113	Natural disasters such as landslides and floods destroyed crops and animals.	3.00	2.15
100	Limited varieties of crops can be grown due to bad weather.	2.09	2.41
		3.49	**1.73**

APPENDIX - B

Concept Mapping Data Collection Package for Sorting and Rating

MIID-Cornell University's LIFT Project

Securing Positive Nutritional Outcomes through Agricultural Extension, Nutrition Education and Institution Building in Rural Chin State (NOAC):
Assessing the Requirements for Food and Nutrition Security

Instructions for Data Collection

This packet contains complete instructions and data collection forms for three key data collection tasks of the concept mapping process:

- Task 1: Demographic questions
- Task 2: Sorting statements into groups and recording your results
- Task 3: Rating the relative importance and feasibility of each individual statement

For **Task 1:** Demographic Questions, you should have the following:

- Demographic Sheet

For **Task 2:** Sorting and Recording, you should have the following:

- Instructions - Sorting and Recording (2 pages)
- For Step 1, the statements in a deck of cards
- For Step 2, Sort Recording Sheet

For **Task 3**: Rating, you should have the following:

- Importance and Feasibility Rating Recording Sheets

Please follow the enclosed instructions very carefully; a few small errors can significantly influence the final results.

Once you are finished, please return the following three items:

- the Demographic Sheet
- the Sort Recording Sheet
- the Importance Rating Recording Sheet.

Task 1: Demographic Questions

Please complete each question below by marking a check next to the most appropriate answer. While your data in this project is anonymous, and we will not ask for your name, we will not be able to include your data in some analyses that look at demographic subgroups if you don't complete all of these demographic questions.

1. What is your affiliation/job title?

Farmer	☐	Village Head/Administrator	☐	Government Officials	☐
Midwife	☐	Village Health Worker	☐	UN/NGO/CSO	☐
School Teacher	☐	Extension agent/worker	☐	Others, please specify	

2. Number of years of your experience in farming/agriculture and food related business?

0-5 years	☐	10-15 years	☐	20-25 years	☐
5-10 years	☐	15-20 years	☐	Above 25 years	☐

3. Do you use a cellular/mobile phone?

Yes ☐ No ☐

Task 2 - Instructions for Sorting and Recording

Step 1 - Sorting the Task Statement Cards. Enclosed in your package is a deck of cards with one statement per card. Each card has a statement and an ID number. We would like you to *group the statements into piles in a way that makes sense to you*, following these guidelines:

- Group the statements for how *similar in meaning* they are to one another. Do not group the statements according to how important they are, how high a priority they have, etc. Another part of the process will ask you how important you believe each idea is.
- There is no right or wrong way to group the statements. You will probably find that you could group the statements in several sensible ways. Pick the arrangement that feels best to you.
- You cannot put one statement into two piles at the same time. Each statement must be put into only one pile.
- People differ on how many piles they wind up with. In most cases, anywhere from 10 to 20 piles usually works out well.
- A statement may be put alone as its own pile if you think it is unrelated to all the other statements or it stands alone as a unique idea. Do not have any piles of 'miscellaneous' statements.
- Make sure that every statement is put somewhere. Do not leave any statements out.

Step 2 - Recording the Results. You also have in this packet a **Sort Recording Sheet** for recording the results of your groupings. On that sheet, please write the results as described below. An example of how to record a pile is shown in the first box on the Sort Recording Sheet.

- Pick up any one of your piles of statements. It does not matter what order the piles are recorded in.
- Quickly scan the statements in this pile, and write down a *short phrase* or *title* that describes the contents of the pile on the line provided after ***Pile Title or Main Topic*** in the first available box on the Sort Recording Sheet.
- In the space provided under the pile name, write the statement identification (ID) number of each card in that pile. Separate the numbers with commas. When you finish with the pile, put it aside so you don't mistakenly record it twice.
- Move on to your next pile and repeat the three steps above, recording the statement numbers in the next available box on the Sort Recording Sheet. Continue in this way until all your piles have been named and recorded.
- Your Sort Recording Sheet has room for you to record up to 20 piles or groups of cards. As mentioned above, any number of piles (usually 10 to 20) is fine. If you have more than 20 piles, continue recording your results on a blank sheet of paper and be sure to attach this extra sheet to the ones provided.
- ***Please write legibly and clearly.*** Most of the errors that find their way into the program and results are made at this stage and are due to data that is hard to read.

When you have recorded all of the piles, please go on to Task 3 - Rating.

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Concept Mapping Sorting Cards

(1) Poor soil conditions limit production of many crops	(8) Poor agricultural extension services at the village level
(2) The land is too steep to grow cereal crops	(9) Farmers need education on improved growing practices
(3) The steep landscape makes it difficult to find land to produce enough food	(10) People do not have enough income to buy food
(4) Agriculture lands are destroyed by landslides	(11) Poor soil does not allow farmers to produce enough food
(5) Food production and yield from shifting cultivation is low	(12) Lack of storage facilities for harvested crops
(6) Poor access to quality seeds in many villages	(13) There is no year round food sufficiency through shifting cultivation
(7) People do not have technical knowledge to produce enough food	(14) Due to high production cost and poor market access, people do not have enough income

(15) Soil quality is poor due to the short time period for keeping the land fallow	(22) Not enough land to grow cereal crops
(16) Most of the lands are infertile and too dry to grow crops	(23) People spend more money than they earn and end up in the debt cycle
(17) Crop yields have decreased due to irregular rain	(24) There are not enough farmers to produce food
(18) Due to the forest fire, soil is dry and it is difficult to grow crops	(25) Households could not get enough food from shifting cultivation
(19) The top soil is around 1 feet deep but there are many hard pan areas which affects crop growth	(26) People cannot access markets to buy or sell food
(20) Crop yields are low due to the lack of technology	(27) Due to plant diseases, farmers have less interest in high value crop production
(21) Compared to central Myanmar, there are limited lands available to grow crops	(28) Lack of capital to expand crop cultivation

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Concept Mapping Sorting Cards

(29) Small-scale enterprises do not get government support	(36) Lack of livestock raising and animal feed shops in Hakha
(30) Farmers do not grow high value crops so do not have enough money to buy food	(37) Poor access to animal feed makes livestock raising in Chin State seem difficult
(31) Many people depend on remittances and they have less interest in food production	(38) In Chin State, paddy cultivation is very limited, which may impact on animal feed availability
(32) Extreme weather changes result in fewer working days, so people do not have enough money to buy food	(39) Due to expensive labor there are very few livestock (cows, goats, Mython) breeders in Chin State
(33) The price of vegetables is high in Hakha so people cannot afford to buy them	(40) Household incomes are not enough to feed families
(34) The land is insufficient to produce enough food for the growing population	(41) There are difficulties in using Artificial Insemination for accessing good livestock/strains
(35) Migration of people from Chin State to other countries is high	(42) There are many difficulties with the transportation of livestock

(43) Lack of staff in LBVD office makes it hard to reach villages to provide vaccination	(50) Deforestation causes poor soil conditions which lead to low yields
(44) Too much dependence on remittance money from abroad decreases labor in agriculture	(51) Lack of good seeds and good breeds of livestock are the main cause of low food production
(45) Lack of a seasonal crop calendar and agricultural knowledge, so people do not know when to grow crops	(52) Natural disaster destroyed farmland in many villages
(46) The working hours per day are short, so production is low	(53) Rats and birds eat paddy and other crops
(47) Remittance money is not invested in farm businesses to produce enough food and increase incomes	(54) Climate changes results in production losses
(48) Due to the short fallow period the soils are poor or infertile causing low production of crops	(55) Many families don't have enough income to buy food
(49) There are too many people and not enough job, so people do not have enough money to buy food	(56) Poor roads cause people to earn low incomes from their products

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Concept Mapping Sorting Cards

(57) Bad soil and the lack of water lead to low yields	(64) Soil erosion and water insufficiency due to shifting cultivation leads to low crop yield
(58) Lack of knowledge on upland agriculture leads to low yield	(65) Farmers grow few seasonal crops and their working season is very short (4/12 months)
(59) People do not have savings to buy food for the family	(66) Poor soil causes low crop production and low yields
(60) Not enough labor for agricultural production, so there is not enough food	(67) Due to infertile soil in backyard gardens, very few crops were harvested
(61) Not enough food is produced due to the lack of agricultural knowledge	(68) Poor "Good Agricultural Practices" (GAP) lead to low yields
(62) Income from agriculture is low so people don't have enough money to buy food	(69) Farmers need to borrow money to buy food before they harvest their crops
(63) People do not have capital to expand agricultural land	(70) Climate change causes irregular crop growing patterns which can lead to low yields

(71) Poor irrigation system for farming causes low yields of food crops	(78) People don't have a proper education which limits job opportunities to earn enough income
(72) Livestock destroyed the crops	(79) Lack of business opportunities cause low incomes to buy food
(73) There are no markets in the villages to sell and buy crops and food	(80) Agriculture lands are limited to produce enough food and to earn enough income
(74) Food production was low due to the lack of application of fertilizers	(81) Lack of knowledge and education about agriculture and farming systems
(75) Poor roads limit the transportation of food	(82) The land structure (geography) is not suitable for cultivation of many crops
(76) People do not have access to a diverse diet	(83) Due to climate change crop growing patterns are changing
(77) People don't have enough knowledge on financial management which leads to food insufficiency	(84) Crop yields are low due to poor agricultural practices

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Concept Mapping Sorting Cards

(85) Due to poor access to market information, people do not make enough money	(92) Crop production decreased due to the practice of shifting cultivation (slash & burn)
(86) People are not interested in growing their own food	(93) Due to irregular rain and drought farmers suffered from the loss of crops
(87) Farmers don't have storage facilities and they have nothing to sell when prices are high	(94) Farmers cannot access improved varieties of rice, corn and potato
(88) Due to labor shortages, farmers could not produce enough crops	(95) No access to improved farming technology
(89) Due to Insufficient water, lack of cow and buffalos, terrace farming is difficult	(96) There is not enough working labor at the household level
(90) Farmers did not apply the required fertilizers to get good crop yields	(97) Due to increased debt and lack of capital, farmers could not keep their crops until they could get a high market price
(91) People spend money on unhealthy food instead of fresh food	(98) Lack of animals and cattle for farming operations

(99) Limited land for paddy cultivation and banana	(106) People don't eat fish very often, due to its expensive price
(100) Limited varieties of crops can be grown due to bad weather	(107) Lack of knowledge on soil management
(101) Destruction of fishponds by landslides	(108) Due to limited land there is no suitable farming land to produce enough food
(102) Destruction of forests by the people	(109) Crop plantation and farming land are destroyed by natural disasters
(103) Scarcity of water for crop cultivation	(110) Limited water after landslide disaster
(104) Limited awareness on food and nutrition information, such as Elephant Foot Yam	(111) Limited agricultural knowledge on modern farming
(105) Very difficult to do fish farming	(112) Landslides affected livelihoods, houses were destroyed, and animals died

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Concept Mapping Sorting Cards

(113) Natural disasters such as landslides and floods destroyed crops and animals	(120) Livestock production is failing because of animal diseases
(114) Cabbages are being destroyed by worms and farmers got very low yields	(121) Many households have more eaters and fewer workers
(115) Limited knowledge on Livestock raising and crop cultivation	(122) Parents couldn't afford to send their children to Hakha for studying
(116) No access to animal feed such as pasture, pig & poultry feed, etc.	(123) Lack of education on food and nutrition in the communities
(117) Poor storage facilities and perishability of vegetables	(124) Due to outbreaks of animal disease, people couldn't raise animals properly
(118) Farmers got low prices for vegetables in the village	(125) Lack of knowledge on agriculture and livestock farming
(119) There are limited lands for crop cultivation	(126) Due to insect and pest infestations (strawberry, cabbage, potato) farmers got low yields

(127) Young people migrate to urban area for education (families have to remit/send money)	(134) Malnutrition and vitamin deficiency were found in primary school students
(128) Wild animals destroyed the farms, crops and plantations	(135) Lack of food causes malnutrition in Chin State
(129) There is not enough water for fishponds	(136) Pregnant women suffer from malnutrition due to poor food consumption
(130) Lack of capital for fish farming business	(137) There are no traders and markets for agricultural products
(131) Wild dogs and foxes kill chicken and pigs	(138) The family size is big in many households and they don't have enough income
(132) Corn, bean and Chin sesame are mostly grown in shifting cultivation but give low yields	(139) Outbreaks of foot and mouth disease in cattle, blue ear disease in pigs and chicken flue create food insecurity
(133) Substitute sunflower production on destroyed paddy land would be good for Surkhua farmers	(140) There are no more fish in the rivers and fishponds were damaged by landslides

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Concept Mapping Sorting Cards

(141) Deforestation and environmental degradation		(146) Lack of financial and food consumption management skills, results in people having inadequate food and money
(142) People became landless due to landslides		(147) Lack of business or trade opportunities due to bad roads and poor transportation
(143) Due to limited agricultural land, people can't produce enough food		(148) Because of health issues people cannot work efficiently on the farms
(144) Paddy fields are destroyed by wild boar, bears and eaten by rats and worms		(149) Livestock are dying from diseases and it is difficult to reproduce them
(145) There are very few educated people in villages and less job opportunities to earn incomes		(150) People don't get enough incomes from weaving and so they can't afford to buy food for the family

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Sort Recording Sheet

This sheet is to be used for **Task 1, Step 2 - Recording the Results**. Specific directions for recording your sorts are included in the Instructions for Task 1 - Sorting and Recording. **Remember that you do not have to have as many piles as there are boxes on this sheet. The space is provided to allow for variability among participants in the way they group the items. The first box (Example Pile) is filled out to serve as a guide for you.**

Example Pile Title or Main Topic: ____Food and Nutrition Information___________

Record here the identifying number of each item in this pile, separating the ID numbers with commas.

1, 4, 29, 43, 12

Start recording your sorts here:

Pile Title or Main Topic: ____

Record here the identifying number of each item in this pile, separating the ID numbers with commas.

Pile Title or Main Topic: ____

Record here the identifying number of each item in this pile, separating the ID numbers with commas.

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Pile Title or Main Topic: ____
Record here the identifying number of each item in this pile, separating the ID numbers with commas.

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Importance Rating Recording Sheet

This sheet is to be used for **Task 3 - Rating**. Check one box corresponding to a value between 1 and 5 for each Task Statement in terms of how important you think it is: Use the following scale:

1 = ***relatively unimportant*** compared to the rest
2 = ***somewhat important*** compared to the rest
3 = ***moderately important*** compared to the rest
4 = ***very important*** compared to the rest
5 = ***extremely important*** compared to the rest

Please discriminate between the statements and use all five rating values at least several times each. (Check one box per statement.)

Importance Rating						STATEMENTS
1	2	3	4	5	ID	
					1	Poor soil conditions limit production of many crops
					2	The land is too steep to grow cereal crops
					3	The steep landscape makes it difficult to find land to produce enough food
					4	Agriculture lands are destroyed by landslides
					5	Food production and yield from shifting cultivation is low
					6	Poor access to quality seeds in many villages
					7	People do not have technical knowledge to produce enough food
					8	Poor agricultural extension services at the village level
					9	Farmers need education on improved growing practices
					10	People do not have enough income to buy food
					11	Poor soils do not allow farmers to produce enough food
					12	Lack of storage facilities for harvested crops
					13	There is no year round food sufficiency through shifting cultivation
					14	Due to high production costs and poor market access, people do not have enough income
					15	Soil quality is poor due to the short time period for keeping the land fallow
					16	Most of the lands are infertile and too dry to grow crops
					17	Crop yields have decreased due to irregular rain
					18	Due to the forest fires, soil is dry and it is difficult to grow crops
					19	The top soil is around 1 feet deep but there are many hard pan areas which affects crop growth.
					20	Crop yields are low due to the lack of technology
					21	Compared to central Myanmar, there are limited lands available to grow crops
					22	Not enough land to grow cereal crops.
					23	People spend more money than they earn and end up in the debt cycle
					24	There are not enough farmers to produce food.
					25	Households could not get enough food from shifting cultivation.

Importance Rating Recording Sheet (cont.)

1 = ***relatively unimportant*** compared to the rest
2 = ***somewhat important*** compared to the rest
3 = ***moderately important*** compared to the rest
4 = ***very important*** compared to the rest
5 = ***extremely important*** compared to the rest

Importance Rating						STATEMENTS
1	2	3	4	5	ID	
					26	People cannot access markets to buy or sell food
					27	Due to plant diseases, farmers have less interest in high value crop production
					28	Lack of capital to expand crop cultivation
					29	Small-scale enterprises do not get government support
					30	Farmers do not grow high value crops so do not have enough money to buy food
					31	Many people depend on remittances and have less interest in food production
					32	Extreme weather changes result in fewer working days, so people do not have enough money to buy food
					33	The price of vegetables is high in Hakha so people cannot afford to buy them
					34	The land is insufficient to produce enough food for the growing population
					35	Migration of people from Chin State to other countries is high.
					36	Lack of livestock raising and animal feed shops in Hakha
					37	Poor access to animal feed makes livestock raising in Chin State seem difficult
					38	In Chin State, paddy cultivation is limited, which may impact on animal feed availability.
					39	Due to expensive labor there are very few livestock (cows, goats, Mython) breeders in Chin State
					40	Household Incomes are not enough to feed families.
					41	There are difficulties in using Artificial Insemination for accessing good livestock/strains
					42	There are many difficulties with the transportation of livestock
					43	Lack of staff in LBVD office makes it hard to reach villages to provide vaccination
					44	Too much dependence on remittance money from abroad decreases labor in agriculture
					45	Lack of a seasonal crop calendar and agricultural knowledge, so people do not know when to grow crops
					46	The working hours per day are short, so production is low
					47	Remittance money is not invested in farm businesses to produce enough food and increase incomes
					48	Due to the short fallow period the soils are poor or infertile causing low production of crops.
					49	There are too many people and not enough job, so people do not have enough money to buy food
					50	Deforestation causes poor soil conditions which leads to low yields
					51	Lack of good seeds and good breeds of livestock are the main causes of low food production
					52	Natural disaster destroyed farmland in many villages

Importance Rating Recording Sheet (cont.)

1 = ***relatively unimportant*** compared to the rest
2 = ***somewhat important*** compared to the rest
3 = ***moderately important*** compared to the rest
4 = ***very important*** compared to the rest
5 = ***extremely important*** compared to the rest

Importance Rating						STATEMENTS
1	2	3	4	5	ID	
					53	Rats and birds eat paddy and other crops
					54	Climate changes results in production losses
					55	Many families don't have enough income to buy food
					56	Poor roads cause people to earn low incomes from their products
					57	Bad soil and the lack of water lead to low yields
					58	Lack of knowledge on upland agriculture leads to low yield
					59	People do not have savings to buy food for the family
					60	Not enough labor for agricultural production, so there is not enough food
					61	Not enough food is produced due to the lack of agricultural knowledge
					62	Income from agriculture is low so people don’t have enough money to buy food
					63	People do not have capital to expand agricultural land
					64	Soil erosion and water insufficiency due to shifting cultivation, leads to low crop yield
					65	Farmers grow few seasonal crops and their working season is short (4/12 months)
					66	Poor soil causes low crop production and low yields
					67	Due to infertile soil in backyard gardens, very few crops were harvested
					68	Poor ‘Good Agricultural Practices’ (GAP) lead to low yields
					69	Farmers need to borrow money to buy food before they harvest their crops
					70	Climate change causes irregular crop growing patterns which can lead to low yields
					71	Poor irrigation system for farming causes low yields of food crops
					72	Livestock destroyed the crops
					73	There are no markets in the villages to sell and buy crops and food
					74	Food production was low due to the lack of application of fertilizers
					75	Poor roads limit transportation of food
					76	People do not have access to a diverse diet
					77	People don't have enough knowledge on financial management which leads to food insufficiency
					78	People don’t have a proper education which limits job opportunities to earn enough income
					79	Lack of business opportunities cause low incomes to buy food
					80	Agriculture lands are limited to produce enough food and to earn enough income
					81	Lack of knowledge and education about agriculture and farming systems
					82	The land structure (geography) is not suitable for cultivation of many crops
					83	Due to climate change crop growing patterns are changing
					84	Crop yields are low due to poor agricultural practices

Importance Rating Recording Sheet (cont.)

1 = ***relatively unimportant*** compared to the rest
2 = ***somewhat important*** compared to the rest
3 = ***moderately important*** compared to the rest
4 = ***very important*** compared to the rest
5 = ***extremely important*** compared to the rest

Importance Rating						STATEMENTS
1	2	3	4	5	ID	
					85	Due to poor access to market information, people do not make enough money
					86	People are not interested in growing their own food
					87	Farmers don't have storage facilities and they have nothing to sell when prices are high
					88	Due to labor shortages, farmers could not produce enough crops
					89	Due to Insufficient water, lack of cattle and buffalos, terrace farming is difficult
					90	Farmers did not apply the required fertilizers to get good crop yields
					91	People spend money on unhealthy food instead of fresh food
					92	Crop production decreased due to the practice of shifting cultivation (slash & burn)
					93	Due to irregular rain and drought farmers suffered from the loss of crops
					94	Farmers cannot access improved varieties of rice, corn and potato
					95	No access to improved farming technology
					96	There is not enough working labor at the household level
					97	Due to increased debt and lack of capital, farmers could not keep their crops until they could get a high market price
					98	Lack of animals and cattle for farming operations
					99	Limited land for paddy cultivation and banana
					100	Limited varieties of crops can be grown due to bad weather
					101	Destruction of fishponds by land slides
					102	Destruction of forests by the people
					103	Scarcity of water for crop cultivation
					104	Limited awareness on food and nutrition information, such as Elephant Foot Yam
					105	Very difficult to do fish farming
					106	People don't eat fish very often, due to its expensive price
					107	Lack of knowledge on soil management
					108	Due to limited land there is no suitable farming land to produce enough food
					109	Crop plantation and farming land are destroyed by natural disasters
					110	Limited water after landslide disaster
					111	Limited agricultural knowledge on modern farming
					112	Landslides affected livelihoods, houses were destroyed, and animals died
					113	Natural disasters such as landslides and floods destroyed crops and animals
					114	Cabbages are being destroyed by worms and farmers got low yields
					115	Limited knowledge on livestock raising and crop cultivation
					116	No access to animal feed such as pasture, pig & poultry feed, etc.
					117	Poor storage facilities and perishability of vegetables

Importance Rating Recording Sheet (cont.)

1 = ***relatively unimportant*** compared to the rest
2 = ***somewhat important*** compared to the rest
3 = ***moderately important*** compared to the rest
4 = ***very important*** compared to the rest
5 = ***extremely important*** compared to the rest

Importance Rating						STATEMENTS
1	2	3	4	5	ID	
					118	Farmers got low prices for vegetables in the village
					119	There are limited lands for crop cultivation
					120	Livestock production is failing because of animal diseases
					121	Many households have more eaters and fewer workers
					122	Parents couldn't afford to send their children to Hakha for studying
					123	Lack of education on food and nutrition in the communities
					124	Due to outbreaks of animal disease, people couldn't raise animals properly
					125	Lack of knowledge on agriculture and livestock farming
					126	Due to insect and pest infestations (strawberry, cabbage, potato) farmers got low yields
					127	Young people migrate to urban area for education (families have to remit/send money)
					128	Wild animals destroyed the farms, crops and plantations
					129	There is not enough water for fishponds
					130	Lack of capital for fish farming business
					131	Wild dogs and foxes kill chickens and pigs
					132	Corn, bean and Chin sesame are mostly grown in shifting cultivation but give low yields
					133	Substitute sunflower production on destroyed paddy land would be good for Surkhua farmers
					134	Malnutrition and vitamin deficiency were found in primary school students
					135	Lack of food causes malnutrition in Chin State
					136	Pregnant women suffer from malnutrition due to a lack of proper food consumption
					137	There are no traders and markets for agricultural products
					138	The family size is big in many households and they don't have enough income
					139	Outbreaks of foot & mouth disease in cattle, blue ear disease in pigs, and chicken flu create food insecurity
					140	There are no more fish in the rivers and fishponds were damaged by landslides
					141	Deforestation and environmental degradation
					142	People became landless due to landslides
					143	Due to limited agricultural land people can’t produce enough food
					144	Paddy fields are destroyed by wild boar, bears and crops are eaten by rats and worms
					145	There are very few educated people in villages and less job opportunities to earn incomes
					146	Lack of financial and food consumption management skills results in people having inadequate food and money
					147	Lack of businesses or trade opportunities due to bad roads and poor transportation
					148	Because of health issues, people cannot work efficiently on the farms
					149	Livestock are dying from diseases and it is difficult to reproduce them
					150	People don't get enough incomes from weaving and so they can't afford to buy food for the family

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Feasibility Rating Recording Sheet

This sheet is to be used for **Task 3 - Rating**. Check one box corresponding to a value between 1 and 5 for each Task Statement in terms of how important you think it is: Use the following scale:

1 = ***relatively infeasible*** compared to the rest
2 = ***somewhat feasible*** compared to the rest
3 = ***moderately feasible*** compared to the rest
4 = ***very feasible*** compared to the rest
5 = ***extremely feasible*** compared to the rest

Please discriminate between the statements and use all five rating values at least several times each. (Check one box per statement.)

Feasibility Rating						STATEMENTS
1	2	3	4	5	ID	
					1	Poor soil conditions limit production of many crops
					2	The land is too steep to grow cereal crops
					3	The steep landscape makes it difficult to find land to produce enough food
					4	Agriculture lands are destroyed by landslides
					5	Food production and yield from shifting cultivation is low
					6	Poor access to quality seeds in many villages
					7	People do not have technical knowledge to produce enough food
					8	Poor agricultural extension services at the village level
					9	Farmers need education on improved growing practices
					10	People do not have enough income to buy food
					11	Poor soils do not allow farmers to produce enough food
					12	Lack of storage facilities for harvested crops
					13	There is no year round food sufficiency through shifting cultivation
					14	Due to high production costs and poor market access, people do not have enough income
					15	Soil quality is poor due to the short time period for keeping the land fallow
					16	Most of the lands are infertile and too dry to grow crops
					17	Crop yields have decreased due to irregular rain
					18	Due to the forest fires, soil is dry and it is difficult to grow crops
					19	The top soil is around 1 feet deep but there are many hard pan areas which affects crop growth.
					20	Crop yields are low due to the lack of technology
					21	Compared to central Myanmar, there are limited lands available to grow crops
					22	Not enough land to grow cereal crops.
					23	People spend more money than they earn and end up in the debt cycle
					24	There are not enough farmers to produce food.
					25	Households could not get enough food from shifting cultivation.

Feasibility Rating Recording Sheet (cont.)

1 = ***relatively infeasible*** compared to the rest
2 = ***somewhat feasible*** compared to the rest
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Feasibility Rating						STATEMENTS
1	2	3	4	5	ID	
					26	People cannot access markets to buy or sell food
					27	Due to plant diseases, farmers have less interest in high value crop production
					28	Lack of capital to expand crop cultivation
					29	Small-scale enterprises do not get government support
					30	Farmers do not grow high value crops so do not have enough money to buy food
					31	Many people depend on remittances and have less interest in food production
					32	Extreme weather changes result in fewer working days, so people do not have enough money to buy food
					33	The price of vegetables is high in Hakha so people cannot afford to buy them
					34	The land is insufficient to produce enough food for the growing population
					35	Migration of people from Chin State to other countries is high.
					36	Lack of livestock raising and animal feed shops in Hakha
					37	Poor access to animal feed makes livestock raising in Chin State seem difficult
					38	In Chin State, paddy cultivation is limited, which may impact on animal feed availability.
					39	Due to expensive labor there are very few livestock (cows, goats, Mython) breeders in Chin State
					40	Household Incomes are not enough to feed families.
					41	There are difficulties in using Artificial Insemination for accessing good livestock/strains
					42	There are many difficulties with the transportation of livestock
					43	Lack of staff in LBVD office makes it hard to reach villages to provide vaccination
					44	Too much dependence on remittance money from abroad decreases labor in agriculture
					45	Lack of a seasonal crop calendar and agricultural knowledge, so people do not know when to grow crops
					46	The working hours per day are short, so production is low
					47	Remittance money is not invested in farm businesses to produce enough food and increase incomes
					48	Due to the short fallow period the soils are poor or infertile causing low production of crops.
					49	There are too many people and not enough job, so people do not have enough money to buy food
					50	Deforestation causes poor soil conditions which leads to low yields
					51	Lack of good seeds and good breeds of livestock are the main causes of low food production
					52	Natural disaster destroyed farmland in many villages

Feasibility Rating Recording Sheet (cont.)

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Feasibility Rating						STATEMENTS
1	2	3	4	5	ID	
					53	Rats and birds eat paddy and other crops
					54	Climate changes results in production losses
					55	Many families don't have enough income to buy food
					56	Poor roads cause people to earn low incomes from their products
					57	Bad soil and the lack of water lead to low yields
					58	Lack of knowledge on upland agriculture leads to low yield
					59	People do not have savings to buy food for the family
					60	Not enough labor for agricultural production, so there is not enough food
					61	Not enough food is produced due to the lack of agricultural knowledge
					62	Income from agriculture is low so people don't have enough money to buy food
					63	People do not have capital to expand agricultural land
					64	Soil erosion and water insufficiency due to shifting cultivation, leads to low crop yield
					65	Farmers grow few seasonal crops and their working season is short (4/12 months)
					66	Poor soil causes low crop production and low yields
					67	Due to infertile soil in backyard gardens, very few crops were harvested
					68	Poor 'Good Agricultural Practices' (GAP) lead to low yields
					69	Farmers need to borrow money to buy food before they harvest their crops
					70	Climate change causes irregular crop growing patterns which can lead to low yields
					71	Poor irrigation system for farming causes low yields of food crops
					72	Livestock destroyed the crops
					73	There are no markets in the villages to sell and buy crops and food
					74	Food production was low due to the lack of application of fertilizers
					75	Poor roads limit transportation of food
					76	People do not have access to a diverse diet
					77	People don't have enough knowledge on financial management which leads to food insufficiency
					78	People don't have a proper education which limits job opportunities to earn enough income
					79	Lack of business opportunities cause low incomes to buy food
					80	Agriculture lands are limited to produce enough food and to earn enough income
					81	Lack of knowledge and education about agriculture and farming systems
					82	The land structure (geography) is not suitable for cultivation of many crops
					83	Due to climate change crop growing patterns are changing
					84	Crop yields are low due to poor agricultural practices

Feasibility Rating Recording Sheet (cont.)

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Feasibility Rating						TASK STATEMENTS
1	2	3	4	5	ID	
					85	Due to poor access to market information, people do not make enough money
					86	People are not interested in growing their own food
					87	Farmers don't have storage facilities and they have nothing to sell when prices are high
					88	Due to labor shortages, farmers could not produce enough crops
					89	Due to Insufficient water, lack of cattle and buffalos, terrace farming is difficult
					90	Farmers did not apply the required fertilizers to get good crop yields
					91	People spend money on unhealthy food instead of fresh food
					92	Crop production decreased due to the practice of shifting cultivation (slash & burn)
					93	Due to irregular rain and drought farmers suffered from the loss of crops
					94	Farmers cannot access improved varieties of rice, corn and potato
					95	No access to improved farming technology
					96	There is not enough working labor at the household level
					97	Due to increased debt and lack of capital, farmers could not keep their crops until they could get a high market price
					98	Lack of animals and cattle for farming operations
					99	Limited land for paddy cultivation and banana
					100	Limited varieties of crops can be grown due to bad weather
					101	Destruction of fishponds by land slides
					102	Destruction of forests by the people
					103	Scarcity of water for crop cultivation
					104	Limited awareness on food and nutrition information, such as Elephant Foot Yam
					105	Very difficult to do fish farming
					106	People don't eat fish very often, due to its expensive price
					107	Lack of knowledge on soil management
					108	Due to limited land there is no suitable farming land to produce enough food
					109	Crop plantation and farming land are destroyed by natural disasters
					110	Limited water after landslide disaster
					111	Limited agricultural knowledge on modern farming
					112	Landslides affected livelihoods, houses were destroyed, and animals died
					113	Natural disasters such as landslides and floods destroyed crops and animals
					114	Cabbages are being destroyed by worms and farmers got low yields
					115	Limited knowledge on livestock raising and crop cultivation
					116	No access to animal feed such as pasture, pig & poultry feed, etc.
					117	Poor storage facilities and perishability of vegetables

Feasibility Rating Recording Sheet (cont.)

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Feasibility Rating						TASK STATEMENTS
1	2	3	4	5	ID	
					118	Farmers got low prices for vegetables in the village
					119	There are limited lands for crop cultivation
					120	Livestock production is failing because of animal diseases
					121	Many households have more eaters and fewer workers
					122	Parents couldn't afford to send their children to Hakha for studying
					123	Lack of education on food and nutrition in the communities
					124	Due to outbreaks of animal disease, people couldn't raise animals properly
					125	Lack of knowledge on agriculture and livestock farming
					126	Due to insect and pest infestations (strawberry, cabbage, potato) farmers got low yields
					127	Young people migrate to urban area for education (families have to remit/send money)
					128	Wild animals destroyed the farms, crops and plantations
					129	There is not enough water for fishponds
					130	Lack of capital for fish farming business
					131	Wild dogs and foxes kill chickens and pigs
					132	Corn, bean and Chin sesame are mostly grown in shifting cultivation but give low yields
					133	Substitute sunflower production on destroyed paddy land would be good for Surkhua farmers
					134	Malnutrition and vitamin deficiency were found in primary school students
					135	Lack of food causes malnutrition in Chin State
					136	Pregnant women suffer from malnutrition due to a lack of proper food consumption
					137	There are no traders and markets for agricultural products
					138	The family size is big in many households and they don't have enough income
					139	Outbreaks of foot & mouth disease in cattle, blue ear disease in pigs, and chicken flu create food insecurity
					140	There are no more fish in the rivers and fishponds were damaged by landslides
					141	Deforestation and environmental degradation
					142	People became landless due to landslides
					143	Due to limited agricultural land people can’t produce enough food
					144	Paddy fields are destroyed by wild boar, bears and crops are eaten by rats and worms
					145	There are very few educated people in villages and less job opportunities to earn incomes
					146	Lack of financial and food consumption management skills results in people having inadequate food and money
					147	Lack of businesses or trade opportunities due to bad roads and poor transportation
					148	Because of health issues, people cannot work efficiently on the farms
					149	Livestock are dying from diseases and it is difficult to reproduce them
					150	People don't get enough incomes from weaving and so they can't afford to buy food for the family