

Transforming Food Systems through Nutrition-Sensitive Agriculture

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Introduction and Background Information

Myanmar has an ethnically diverse population of about 51.7 million in a land area of 676,578 square kilometers with three main agroecological zones: Delta, Central Dry Zone (CDZ) and the Hilly zone. The country is divided into 14 states and regions and Nay Pyi Taw Union Territory, with 135 different officially recognized ethnic groups. In the Delta zone, in the south, with a population of about 22 million, farmers are primarily engaged in rice production, particularly during the monsoon. The CDZ, with a population of about 19 million, lies in a monsoonal shadow receiving 600 mm rainfall annually. Farmers are primarily located along the main river valleys, dependent on both rainfed and irrigated agriculture producing rice, oilseeds, beans and pulses, the latter fed by both surface storage and artisanal water supply. In the Hilly zone, with a population of about 6.5 million and dominated by Shan state, farmers cultivate a wide range of rain-fed tree crops and horticulture products along with rice, maize and pulses. Livestock production is found across all three zones, while aquaculture primarily occurs in the delta and coastal areas.

The Agriculture sector is a high priority for the Government of Myanmar. Agriculture, livestock and fisheries account for nearly 30% of GDP and about 56% of employment and from about 25% of exports, earning over \$2.9 billion in 2016/2017 through exports of beans and pulses, oilseeds, rice, shrimp, livestock, and rubber. While historically, rice has been the major agriculture export commodity, more recently, beans and pulses have, on average, generated higher export earnings. Approximately 72% of the population lives in rural areas where 85% of poverty is concentrated, and 24% of rural households are considered vulnerable.

The prevalence of undernutrition among women and children in Myanmar remains unacceptably high. An average of one in three children are stunted and about 8% are acutely malnourished. Micronutrient deficiencies are common among infants, young children and pregnant women. More than 80% of children 6 to 23 months of age and 70% of pregnant women are anemic.

Box 1: Key Findings: Nutrition of Children and Women in Myanmar

Source: Myanmar Demographic and Health Survey 2015-2016, MoHS (2017)

- **Nutritional status of children:** Twenty-nine percent of children under age 5 are stunted (short for their age), 7% are wasted (thin for their height), 19% are underweight (thin for their age), and 1% are overweight (heavy for their height).
- **Breastfeeding:** Almost all children (98%) are breastfed at some point in their life. Half of infants under age 6 months are exclusively breastfed (51%).
- **Minimum acceptable diet:** The feeding practices of only 16% of children age 6-23 months meet the minimum acceptable dietary standards.
- **Iron Deficiency Anemia:** Almost three in five children age 6-59 months are anemic (58%), and 47% of women age 15-49 are anemic.
- **Salt Iodization:** Eighty-two percent of households use iodized salt for cooking.
- **Obesity:** Twenty-five percent of women age 15-49 are overweight or obese; 6% are obese.

Feeding young children, pregnant women and lactating mothers healthy, nutritious, safe, quality and diverse foods is one of the major investments for country's development. It is important for people to know the nutritional values of foods they are eating and to have balanced diets to meet their daily nutrient requirements. According to Myanmar Demographic and Health Survey 2015-2016 (MoHS and ICF, 2017) report protein, Vitamin A, Vitamin B1, Iron, and Iodine deficiencies are very high in Myanmar.

Increasing availability and accessibility of locally grown and produced protein rich foods (meat, poultry, fish, eggs, peas and beans, seeds and nuts) and micronutrients rich fruits and vegetables in the communities where many households with limited resources will help improve food and nutrition security of community members.

Nutrition-Sensitive 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. 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 global food system better equipped to produce good nutritional outcomes.

In order to properly address the problem of malnutrition, interventions are needed throughout the entire food system, from production to processing, transport, consumption and waste management. Improvements will also be needed in complementary sectors such as health, education, water and sanitation to eliminate the spread of infectious diseases and to share knowledge on successful nutrition practices. Governments, too, must integrate nutrition-sensitive strategies into their agricultural development policies to ensure nutrition-sensitive programs are funded and implemented. Cross-sectoral coordination is essential for sustainable, comprehensive advancements in eliminating malnutrition.

Nutrition-Sensitive Agricultural Programming

Agricultural development plays an essential role in improving nutrition. The term "Nutrition-Sensitive Agriculture" has emerged as a way to define agriculture investments made with the intention of also improving nutrition. Investments require deliberate and appropriate forethought and planning to yield impact on nutritional status and consequently good health and wellbeing. Investments in agriculture help alleviate poverty, improve food security, and may prevent undernutrition, especially since 72 percent of the population lives in rural areas and work in agriculture. For a majority of the rural population in Myanmar, agriculture is the primary livelihood and main source of income. Most of these communities are in various stages of transition from subsistence farming to commercial farming. Most of the rural poor must produce at least some of their food and depend on the market for buying the remainder. Diets are often monotonous, consisting primarily of nutrient-poor staple foods. Particularly nutritionally vulnerable households engage in daily labor on other households' farms. In addition, rural households depend on income from agriculture for other expenses that affect physical and cognitive development of children, such as health care, water, sanitation and hygiene, shelter, school fees, clothing, fuel, and transport.

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

- **Making food more available and accessible.** Increasing agricultural production makes more food available and affordable, which improves 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 can prevent micronutrient deficiencies by enhancing micronutrient content in foods through processing, plant breeding and improved soil fertility.

In addition to changes in the agriculture sector, government can promote nutrition-sensitive agriculture by incorporating nutrition-sensitive concepts into relevant farm policies and programs.

Healthy, well-nourished people are both the outcome of successful social and economic development as well as an essential input into the development process. Agriculture is the main source of food, employment and income for 70 to 80 percent of people suffering from hunger in developing countries. As such, food security is unlikely to be achieved without considerable attention to the food and agriculture sector. However, progress in promoting and implementing nutrition-sensitive strategies for improved micronutrient status has been slow. Started early, a nutrition-sensitive approach can contribute to physiological, mental and social development, enhance learning potential, reduce nutritional disorders and contribute to the prevention of diet-related diseases later in life.

Nutrition-Sensitive Agriculture and Food Systems

Nutrition-sensitive agriculture is an approach that seeks to ensure the production of a variety of affordable, nutritious, culturally appropriate and safe foods in adequate quantity and quality to meet the dietary requirements of populations in a sustainable manner. The recognition that addressing nutrition requires taking action at all stages of the food chain - from production, processing, retail to consumption - has led to a broader focus which encompasses the entire food system. Making agriculture and food systems nutrition-sensitive necessitates taking action to address input quality, production, post-harvest handling, processing, retailing and consumption, in order to deliver safe and nutritious foods all year round to the consumer. Nutrition-sensitive agriculture and food systems contribute to improving health outcomes, through for example, production of diverse, safe and nutrient-rich food, income generation that can facilitate access to health services, through reducing contamination of water sources, and through the application of labour-saving technologies.

“A food system gathers all the elements (environment, people, inputs, processes, infrastructures, institutions, etc.) and activities that relate to the production, processing, distribution, preparation and consumption of food, and the outputs of these activities, including socioeconomic and environmental outcomes.” (HLPE 2014, p29)

How do we make Agriculture and Food Systems Nutrition-Sensitive?

Food systems provide for all people's nutritional needs, while at the same time contributing to economic growth. The food and agriculture sector has the primary role in feeding people well by *increasing availability, affordability, and consumption of diverse, safe, nutritious foods and diets* aligned with dietary recommendations and environmental sustainability. Applying these principles helps strengthen resilience and contributes to sustainable development. FAO provided key recommendations for Improving nutrition through agriculture and food systems: 10 recommendations for designing programmes in a nutrition-sensitive way and 5 recommendations for creating an enabling environment for nutrition.

While agriculture and food systems obviously play a key role in nutrition, experience shows that policies and programmes are more likely to have a positive impact on nutrition, and avoid negative impacts, if the following principles are applied:

1. Incorporate explicit nutrition objectives and indicators into their design, and track and mitigate potential harms, while seeking synergies with economic, social and environmental objectives.
2. Assess the context at the local level, to design appropriate activities to address the types and causes of malnutrition, including chronic or acute undernutrition, vitamin and mineral deficiencies, and obesity and chronic disease. Context assessment can include potential food resources, agro-ecology, seasonality of production and income, access to productive resources such as land, market opportunities and infrastructure, gender dynamics and roles, opportunities for collaboration with other sectors or programmes, and local priorities.
3. Target the vulnerable and improve equity through participation, access to resources and decent employment. Vulnerable groups include smallholders, women, youth, the landless, urban dwellers, the unemployed.
4. Collaborate and coordinate with other sectors (health, environment, social protection, labour, water and sanitation, education, energy) and programmes through joint strategies with common goals, to address concurrently the multiple underlying causes of malnutrition.
5. Maintain or improve the natural resource base (water, soil, air, climate, biodiversity), critical to the livelihoods and resilience of vulnerable farmers and to sustainable food and nutrition security for all. Manage water resources in particular to reduce vector-borne illness and to ensure sustainable, safe household water sources.
6. Empower women by ensuring access to productive resources, income opportunities, extension services and information, credit, labour and time-saving technologies (including energy and water services) and supporting their voice in household and farming decisions. Equitable opportunities to earn and learn should be compatible with safe pregnancy and young child feeding.
7. Facilitate production diversification and increase production of nutrient-dense crops and small-scale livestock (for example, horticultural products, legumes, livestock and fish at a small scale, underutilized crops, and biofortified crops). Diversified production systems are important to vulnerable producers to enable resilience to climate and price shocks, more diverse food consumption, reduction of seasonal food and income fluctuations, and greater and more gender-equitable income generation.
8. Improve processing, storage and preservation to retain nutritional value, shelf-life, and food safety, to reduce seasonality of food insecurity and post-harvest losses, and to make healthy foods convenient to prepare.
9. Expand markets and market access for vulnerable groups, particularly for marketing nutritious foods or products vulnerable groups have a comparative advantage in

producing. This can include innovative promotion (such as marketing based on nutrition content), value addition, access to price information, and farmer associations.

10. Incorporate nutrition promotion and education around food and sustainable food systems that builds on existing local knowledge, attitudes and practices. Nutrition knowledge can enhance the impact of production and income in rural households, especially important for women and young children, and can increase demand for nutritious foods in the general population.

Agriculture programmes and investments need to be supported by an enabling policy environment if they are to contribute to improving nutrition. Governments can encourage improvements in nutrition through agriculture by taking into consideration the five policy actions below.

1. Increase incentives (and decrease disincentives) for availability, access, and consumption of diverse, nutritious and safe foods through environmentally sustainable production, trade, and distribution. The focus need to be on horticulture, legumes, and small-scale livestock and fish – foods which are relatively unavailable and expensive, but nutrient-rich and vastly underutilized as sources of both food and income.
2. Monitor dietary consumption and access to safe, diverse, and nutritious foods. The data could include food prices of diverse foods, and dietary consumption indicators for vulnerable groups.
3. Include measures that protect and empower the poor and women. Safety nets that allow people to access nutritious food during shocks or seasonal times when income is low; land tenure rights; equitable access to productive resources; market access for vulnerable producers (including information and infrastructure). Recognizing that a majority of the poor are women, ensure equitable access to all of the above for women.
4. Develop capacity in human resources and institutions to improve nutrition through the food and agriculture sector, supported with adequate financing.
5. Support multisectoral strategies to improve nutrition within national, regional, and local government structures.

Nutrition-Sensitive Agriculture Training in Myanmar

Linking agriculture, food systems and nutrition through Nutrition-Sensitive Agricultural practices shows many positive outcomes to support transformation of food systems and the UNSDGs.

Over 750 extension managers and field extension workers across Myanmar were provided Nutrition-Sensitive Agriculture (NSA) training workshop focusing on integrating nutrition information into agricultural extension education programs. Training materials were organized in 5 modules and a range of topics were covered. Pre/Post Training Needs Assessments were conducted with participants.

- The Module 1 includes the following topics: An introduction to Nutrition-Sensitive Agricultural programming, food and nutrition security in Myanmar, ASEAN and global, understanding food systems, Nutrition-Sensitive Agriculture: Linking agriculture, food systems and nutrition.
- The Module 2 covers Nutrition basics, essential nutrition concepts, indicators of nutritional status, micronutrient malnutrition, and interdependence between health and nutritional status.
- The Module 3 includes connecting agriculture to nutritional status, conceptual pathways that connect agriculture and nutrition, The Pathways Model: Food Production Pathway; Income Pathway; Women's Empowerment Pathway, expanding the Pathways Model, and value chains for nutrition.

- The Module 4 covers Nutrition-Sensitive Program Design: Where do I start? Guidelines for designing Nutrition-Sensitive agricultural programs, steps to improve the nutrition sensitivity of programs, understanding the surrounding context, and collaboration through Multi-Sectoral Work.
- The Module 5 focuses on review and group presentations including participants' individual and group assignments and case studies.

Throughout the NSA training participants were able to work group exercises on food and nutrition security in Myanmar: creating food production calendars by different agro-ecological zones, food productivity, food availability, food accessibility, food utilization, and nutrition analysis of Myanmar foods. In order to “Put Lessons into Practices” participants were given an opportunity to practice healthy food preparation through Hands-on Cooking Demo where participants were able to apply nutrition messages, food safety guidelines, good hygiene practices and dietary diversity.

At the training participants were provided formal presentation on both Agricultural Extension and Nutrition-Sensitive Agriculture blending with discussion sessions and individual and group exercises through participatory and learner-centered approach. During the training participants were able to identify the constraints of existing agricultural extension system in Myanmar and conducted group discussions on needs, problems, challenges and opportunities of agricultural development, food and nutrition security in Myanmar and how to integrate nutrition information within agricultural extension programs. Participants were actively involved in discussion sessions, field study trip to vegetable growers, food demonstration, individual and group exercises throughout the training. Participants were provided a hard copy and a soft copy (USB) of training materials for both training workshops and certificate of completion.

Conceptual Pathways Linking Agriculture and Nutrition

Agricultural livelihoods affect nutrition of individual household members through multiple pathways and interactions. The framework depicted in figure 1 helps us to understand how various agriculture investments or activities could improve access to food and health care; how they impact and are affected by the enabling environment; and how they ultimately affect the nutrition of individual women and children.

The pathways are not always linear, and there are many interactions among them. In general, they can be divided into three main routes at the household level: 1) food production, which can affect the food available for household consumption as well the price of diverse foods; 2) agricultural income for expenditure on food and non-food items; and 3) women's empowerment, which affects income, caring capacity and practices, and female energy expenditure. Acting on all of these routes is the enabling environment for nutrition, including several key components: the natural resources environment; the food market environment; the health, water, and sanitation environment; nutrition and health knowledge and norms; and other factors, such as policy and governance. These components may affect nutrition of consumers or communities, not only farmer households. Child nutrition outcomes ultimately feed back into national economic growth and household assets and livelihoods, including those that contribute to both agricultural and nonagricultural sources of income.

Several pathways have been identified showing how nutrition-sensitive agriculture interventions can more directly impact nutrition and food security. Interventions should be designed considering the pathways most relevant to the value chain and the most relevant underlying causes of undernutrition.

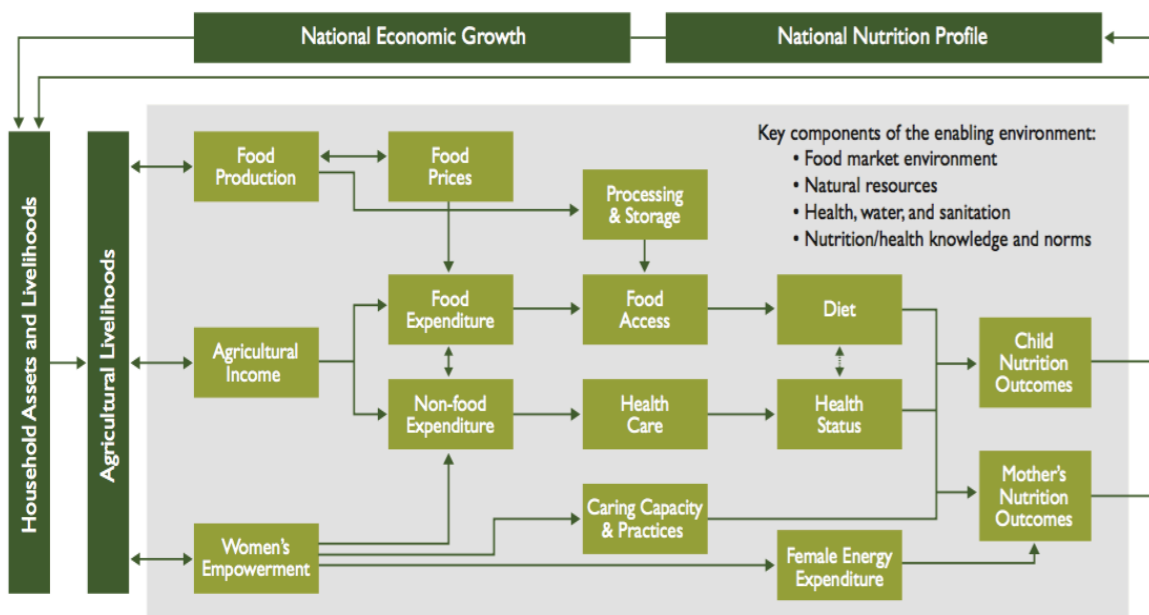


Figure 1: Conceptual Pathways Between Agriculture and Nutrition

Source: Adapted from Herforth and Harris, 2014

Conclusion

Nutrition-Sensitive Agriculture Training workshops were conducted across Myanmar in 2017, 2018, and 2019 through UNOPS-LIFT funded project, SDC funded project and the World Bank Myanmar funded project. In August 2018, through the World Bank Myanmar funded project five days long NSA training workshop has been successfully conducted with countrywide extension managers and officers from 14 State and Region across Myanmar. The training was conducted at AERDTC with 50 participants from DOA State/Region, DOA-HQ Extension, Land use, Seed, Plant Protection, and Planning Divisions. High level extension administrators including Deputy Director Generals of Department of Agriculture, head of Extension Division, Seed Division, Plant Protection Division, principal, deputy Principal and trainers of AERDTC attended as observers.

Nutrition Sensitive Agriculture and Modernized Extension Education courses were successfully introduced to agricultural managers and extension officers of State/Region Department of Agriculture and students and faculty members of 14 State Agricultural Institutes. About 785 agricultural extension managers and extension officers from Department of Agriculture across Myanmar have been trained NSA in 2017, 2018, and 2019 (see Table 1).

During the course of the year 2017 we have reached over 6000 students and faculty of 14 State Agricultural Institutes (see Table 2) and provided education and information about NSA and MEAS. We received positive responses from students, faculty and DOA extension managers and officers and they reported Nutrition-Sensitive Agriculture and Extension Education materials were very useful and they start applying those materials in their professional work on teaching, training and extension outreach activities and more training sessions on NSA and MEAS are highly demanded.

Table 1: List of Attendees from Department of Agriculture (Nutrition-Sensitive Agriculture & Modernized Extension and Advisory Services Training conducted in 2017, 2018, 2019)

Year	State/Region	Agriculture & Extension Managers	Participants
2017	Chin	50 DOA-Chin Statewide in Hakha 20 DOA-Falam	70
2017	Rakhine	DOA-Rakhine Statewide in Sittwe	75
2017	Karen	DOA-HpaAn	40
2017	Mon	DOA-Mon Statewide in Mawlamyine	45
2017	Kayah	DOA- Kayah Statewide in Loikaw	60
2017	Sagaing	DOA-Sagaing in Shwebo	12
2017	Magway	DOA-Magway in PwintPhyu	23
2017	Ayeyarwady	30 DOA-MyaungMya & Labutta 75 DOA-Ayeyarwady in Pathein	105
2017	Bago	DOA-Bago in Thayawaddy	70
2017	Tanintharyi	DOA -Tanintharyi in Dawei	45
2018	Chin	DOA Hakha	35
2018	Nay Pyi Taw (NPT)	DOA-Countrywide Extension Managers from 14 State and Region, Extension Administrators and Officers from DOA Headquarter in NPT Conducted @ AERDTC	50
2019	Shan	DOA-Shan Statewide in Taung Gyi	155
	TOTAL		785

Table 2: List of Attendees from State Agricultural Institutes (Nutrition-Sensitive Agriculture & Modernized Agricultural Extension and Advisory Services)

SAI	Students				Faculty			Total
	1 st Year	2 nd Year	3 rd Year	Subtotal	Male	Female	Subtotal	
Lungpi	97	94	40	231	10	11	21	252
Myitkyina	152	105	151	408	6	18	24	432
Kyauktaw	150	98	-	248	4	11	15	263
Zwekabin	103	85	54	242	4	14	18	260
Thaton	156	110	109	375	13	18	31	406
Demoso	143	86	58	287	3	16	19	306
Heho	201	127	112	440	6	19	25	465
Pyinmana	246	209	162	617	12	20	32	649
Patheingyi	194	157	124	475	9	14	23	498
Shwebo	244	188	139	571	8	15	23	594
Pwintphyu	196	194	228	618	6	22	28	646
Myaungmya	181	145	133	459	10	22	32	491
Thayarwaddy	162	169	146	477	5	20	25	502
Dawei	113	54	52	219	7	22	29	248
	2338	1821	1508	5667	103	242	345	6012

Training on teaching and learning strategies and methodologies were provided to SAI teachers. They learned student-centered and learner-centered teaching methods through NSA and MEAS lectures and training workshops. Students received active learning and cooperative learning opportunities through individual and group exercises both in the classroom and in the field. Students gained knowledge on food systems and nutrition related to agriculture they are studying at State Agricultural Institutes which are located in different agro-ecological zones of Myanmar. Most SAI graduates are employed by Department of Agriculture as field extension workers.

Students, faculty members and DOA extension officers learned best practices of NSA and MEAS focusing on household food security and nutrition security including Farmer Field School, home gardening, community nutrition education, crop diversification, crop intensification, high value crops/products/market system development, women and youth participation in Agribusiness, and integrating nutrition messages within agricultural extension services.

We conducted outcomes evaluation with training participants in the following two consecutive years during the pandemic (2020-2021), designed the curriculum, focused on food systems transformation through Nutrition-Sensitive Agriculture, improved Agricultural Extension Education programs through multi-sectoral approach and focused on SDGs.

The global assessment of the state of food security and nutrition in 2022 is a snapshot of the world still recovering from a global pandemic and now grappling with the consequences of the war in Ukraine, which has rattled food and energy markets. Encouraging signs of economic recovery from the pandemic and projections of a decline in poverty and hunger have been tempered by rising food and energy prices.

New estimates of the prevalence of food insecurity based on the FIES confirm that for 2022 no progress was made on food insecurity at the global level. Following a sharp increase from 2019 to 2020, the global prevalence of moderate or severe food insecurity remained unchanged for the second year in a row, far above pre-COVID-19-pandemic levels. In 2022, an estimated 29.6 percent of the global population – 2.4 billion people – were moderately or severely food insecure, meaning they did not have access to adequate food. This is still 391 million more people than in 2019, before the pandemic.

A comparison of food insecurity in rural, peri-urban and urban populations at the global, regional and subregional levels using the Degree of Urbanization (DEGURBA) classification, a new international standard, shows that at the global level, food security improves as the degree of urbanization increases. Moderate or severe food insecurity affected 33.3 percent of adults living in rural areas in 2022 compared with 28.8 percent in peri-urban areas and 26 percent in urban areas.

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Appendix 1: Photos of Nutrition-Sensitive Agriculture Training Workshop Activities with Extension Administrators and Extension Managers conducted at AERDTC in August 2018





Appendix 2: Photos of Nutrition-Sensitive Agricultural Extension Training Workshop Activities in States and Regions across Myanmar in 2017, 2018, 2019

Upland Nutrition-Sensitive Agricultural Extension Education Training Workshop with Multi-Stakeholder in Hakha



Nutrition-Sensitive Agricultural Extension Education
Training Workshop with Extension Officers from Department of Agriculture in
Hakha, Chin State



Nutrition-Sensitive Agricultural Extension Education Training Workshop with Students from State Agricultural Institutes and Yezin Agricultural University



Food and Nutrition Workshop with Students from
State Agricultural Institutes and Yezin Agricultural University

Students Learning Food Groups and Nutritional Facts of Food Items



Putting Lessons into Practice: Cooking Demonstration

