REPORT ON PARTICIPATORY MAPPING OF AGROBIODIVERSITY

Conducted by NESFAS in 2018 within the "No One Shall Be Left Behind Initiative"

Biodiversity for Food, Nutrition and Energy Security for 3000 Households in Meghalaya and Nagaland, North East India

The report developed in 2019 by:

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Acknowledgment

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Executive summary

In North-East India, poor diet and nutritional status of the communities should be addressed as soon as possible to achieve human and socio-economic development. This should be achieved in a sustainable manner while conserving biodiversity. One of the promising options could be to harness the potential of extraordinary biodiversity of crops and wild food plants, with many of them being extremely nutritious. However, without having information on the available food resources, any progress can be hardly achieved. Therefore, the main objectives of this survey were to document local agrobiodiversity and to understand its perceived characteristics among communities where NESFAS implements a REC-funded project aiming to tap the potential of agrobiodiversity for food, nutrition, and livelihood. Focus group discussions with 848 participants from 32 villages were conducted. The seasonal calendars with crop lists and participatory rankings were the primary data collection tools. On average, a studied village showed to have 200 food plants when all cultivated and wild food plants were considered, including mushrooms, condiments and crop varieties. The highest number of food plants was found in Khweng village (319 food plants), followed by Marmain (297 food plants), and Umsawar (284 food plants). In terms of districts, the most diverse villages were found in Ri Bhoi with an average of 252 food plants per village, followed by Garo Hills (210 food plants), West Khasi Hills (196 food plants), East Khasi Hills (194 food plants), Nagaland (189 food plants), and Jaintia Hills (175 food plants). In a scenario when we excluded condiments, mushrooms, and crop varieties, we found an estimated 124 food plant species (species richness) on average per village. In general, the extent of agrobiodiversity can be considered very high. The documented food plants were categorized into ten standard food groups of dietary diversity. “Other fruits” food group was found to be the most biodiverse, whereas the “Pulses” and “Nuts and seeds” were the least diverse. While the key results and aggregated district-wise findings are present in the report, the village-wise agrobiodiversity profiles, seasonal calendars, participatory rankings, and prioritized food plants to address the dietary diversity gap are available separately. The principal suggestions and learnings are present in the report.

1. Introduction and context of the survey

Malnutrition is responsible for more health problems than any other cause and the burden of malnutrition across the developing world remains unacceptably high (Development Initiatives, 2018). Communities in Meghalaya have both food insecurity and undernutrition unacceptably high (Chyne et al., 2017). Among children below 5 years, 15,3% suffer from wasting, and 43,8% are wasted. Anemia is also a significant concern amongst children in the age group of 6-59 months (Ministry of Health and Family Welfare, 2016).

A diverse diet is a foundation of human nutrition, health, and sustainable development. Indigenous people's health, well-being, and culture are directly related to their ability to eat traditional foods and continue their traditional food practices (Teron, 2018). In North-East India, Indigenous communities have relied on their traditional diets and ethnic foods (Teron, 2018). Yet, indigenous plants and local minor crops are not being utilized and developed properly in the region (Deka, 2012). Recently among Khasis, Nongrum and Dohtdong (2018) found dietary shifts such as decreased consumption of local foods and increased consumption of polished rice, snacks, and other modern foods. However, in neighboring Nagaland, a better utilization of rich cultivated and wild agrobiodiversity by the Chakhesang tribe appeared to be a good reason for their better nutritional and health status (Longvah et al., 2017).

North-East India represents one of the 12 mega-biodiversity hotspots of the world (Hore, 2007). The region is also extremely rich in crop diversity and wild food plants, with many of them being extremely nutritious (Chyne et al., 2019). The richness of indigenous foods emerged from diverse agroecosystems, mosaic landscapes, and rich biodiversity of the region, which comprises about 50% of the total biodiversity of India (Mao et al. 2009). Perhaps the most crucial pillars of the local food systems are the Indigenous territories and local land-use systems. The provisioning of indigenous foods is known to be strongly linked to the maintenance, health, and accessibility of indigenous lands (Kuhnlein et al., 2009). But with globalization, agricultural intensification through monocultures, population increase and other socio-economic pressures, the landscapes and communities' foodways are changing at an unprecedented rate. In Meghalaya, land uses systems are changing rapidly such as from shifting cultivation fields into the permanent plots of cash crop monocultures (e.g. broom grass, areca nut, citruses, or rubber tree) or into more intensive *bun* terraces. Considering these rapid changes, the agrobiodiversity, traditional food systems and indigenous territories of the region should be documented and preserved as vital options of food and nutrition security, sustainability of production and consumption, and resilience of the communities. Through enhanced consumption, processing and value addition, local agrobiodiversity holds the potential to alleviate the poverty, food and nutritional insecurity (Deka, 2012). The agrobiodiversity and local foods can be part of future programs on revitalization or the creation of nutrition-sensitive landscapes (Broegaard et al., 2017; Powell et al., 2015).

2. Objectives of the survey

- To document (map) diversity of food plants in 32 villages of Meghalaya and Nagaland
- To prioritize target food plants for further intervention in a participatory way

3. Methodology

3.1 Study area

Both Meghalaya and Nagaland are characterized by hilly terrain, but while the former is a plateau belonging to the ancient Gondwana Massif, the latter is a part of the more recent Arakan Yoma mountain range. The hills rise from the Brahmaputra valley in Assam from about 600 masl up to an elevation of 1800 masl in the east (mean elevation is around 1000 masl). Latitude and terrain play a critical role in determining the climate and agro-ecological zonation of the districts. The higher elevations enjoy a temperate climate, whereas the lower altitudes have subtropical and tropical conditions. Rainfall is high in all areas because of the influence on the Monsoon winds, which arrives in June and start retreating by September. Both Meghalaya and Nagaland have very high biodiversity with large evergreen to semi-evergreen forests covering more than 60% of the area. It is in terms of ethnic composition, where the difference between the states becomes very obvious. While Meghalaya is mostly composed of two distinct tribes, Khasi-Jaintia and Garo, Nagaland has 16 major tribes. The literacy levels in the studied districts vary in between 60-80% (NESFAS, 2017).

Although the whole project area covers 130 villages-communities from the 8 districts of Meghalaya and 3 districts of Nagaland, the dietary diversity survey selected respondents from 32 villages chosen systematically across all the districts covered by the project. In Meghalaya, specifically, eleven villages were chosen from the East Khasi hills, four from West Khasi Hills, four from West Jaintia Hills, five from West Garo Hills, and five from Ri Bhoi. In Nagaland, three villages were selected from Phek district and one from Noklak district. The particular villages included in the survey were selected by NESFAS, and the main criteria for including villages were to have more than 50 households and village proximity to the road.

3.2 Development and testing of the methodology

The methodology was designed during the previous visit of the consultant in July 2018 in collaboration with the NESFAS research team. At that time, our team developed a methodology that was tested in the Khweng village, and suggestions based on the testing were presented, discussed, and fine-tuned together with NESFAS. The finalized FGD guides and supporting materials were shared with NESFAS. Next year in 2018, NESFAS hired and trained data enumerators, which in tandems (1 facilitator and 1 note taker) collected the data related to participatory species mapping and dietary diversity.

3.3 Focus group discussions with seasonal calendars and participatory ranking

Focus group discussions (FGDs) were conducted to inventory and discuss the local food plants. Prior to the FGD sessions, the purpose, procedure, and outcomes of the discussions were explained to the communities. The Code of Ethics of the Indigenous Partnership for

Agrobiodiversity and Food Sovereignty was followed (Indigenous Partnership, 2011), and the free, prior, and informed consent was obtained. The sessions were of mixed gender, which was culturally suitable, and knowledgeable and active participants were purposively selected (Bernard, 2002). The emphasis was on including voices of diverse age groups, women and men, and community members with different socio-economic status including vulnerable ones. The FGDs were facilitated by a trained team of two moderators, one facilitating the discussion and another one taking notes. In total, 848 respondents participated in FGDs conducted in project villages in East Khasi Hills, West Khasi Hills, West Jaintia Hills, West Garo Hills, and Ri Bhoi. The proportion of women and men participants was 47% to 53%, respectively.

The seasonal calendar with a complete list of food plant diversity was the main tool used during FGDs (PAR, 2018). The seasonal crop and food variation were captured through a monthly and seasonal check. In fact, only the food availability periods since harvesting were enquired. To have data on the diversity of individual land uses, each food plant was cross-checked for its places of occurrence. The plant list was complemented by a participatory group ranking of selected plant characteristics important for the communities. Ranking and scoring are participatory techniques commonly used in ethnobotany (Martin, 2004). After the testing in Khweng village, the plant characteristics that were decided to be ranked throughout the whole survey were: plant abundance, taste, seed access, economic value, easy cultivation/collection, climate resilience, pest and disease resistance. The ranking scores varied from 1 to 3 with three being the highest rank. The study focused on local food plants and although communities obtain some food items through purchases on the markets, the study did not look at the diversity available on the markets. Another limitation of the study is that it did not cover animal-based food groups (i.e., Meat, poultry and fish; Eggs; Dairy).

3.4 Plant identification

Throughout the report, we use the term “food plants” which covers wild and cultivated plant species as well as varieties, following the folk classification. The pictures of food plants were taken by the research or communication team. However, not all the local food plants could be found during the fieldwork time and therefore some plants are documented only by local names. Some of these plants with more familiar local names were identified by a scientific literature review where local and Latin names were compared. Unfortunately, the botanical collection of specimens of lesser-known plant species has not been conducted so far and thus numerous food plants remained unidentified. The scientific names follow The Plant List (2013) and the common English names follow Plant Resources of South-East Asia (Pl@ntUse, 2019), Plants For A Future (PFAF, 2012), and Mansfeld’s World Database of Agricultural and Horticultural Crops (IPK Gatersleben, 2019). The plant list is not present in the current report, but it is available as a separate agrobiodiversity database and agrobiodiversity catalogue, which are being developed by NESFAS with technical back up from the consultant.

3.5 Categorization of plants into the standard food groups

Dietary diversity is an indicator defined as the number of different food groups consumed over the last 24 hours. Dietary diversity score is a validated proxy indicator of dietary

adequacy, i.e. micronutrient adequacy (FAO and FHI, 2016). To break down and categorize local agrobiodiversity, we followed the dietary diversity approach as per the guidelines of Minimum Dietary Diversity for Women (FAO and FHI, 2016). This guide classifies food biodiversity into 10 standard food groups. Out of the ten groups, seven of them are plant-based and therefore can be applied to food plants, i.e., 1. Grains, white roots and tubers, and plantains; 2. Pulses (beans, peas, and lentils); 3. Nuts and seeds; 4. Dark green leafy vegetables; 5. Other vitamin A-rich fruits and vegetables; 6. Other vegetables; and 7. Other fruits. The plants in an additional food group of "Condiments" were also documented even though it does not belong to the 10 standard groups as consumed in small amounts (FAO and FHI, 2016).

3.6 Data handling and analysis

The primary data collected in the field were transcribed from the filled questionnaires into the Excel working sheets. Subsequently, we kept the data separately in the village-wise datasheets, and the first cleaning and cross-checking process was conducted. Afterward, the analysis started by categorizing all the plants into the food categories. The less common foods had to be discussed with NESFAS staff, associated field staff or verified by a phone call with custodian farmers. The results of agrobiodiversity profile, seasonality calendar, and rankings are available for each village in the separate excel sheets.

4. Results and discussion

4.1 Total number of food plants in the study area

Through the plant listing and seasonal calendars, the overall diversity of food plants was documented. Figure 1 shows the total number of food plants in particular villages when all edible plant species, crop varieties, condiments, and mushrooms are considered. On average, a studied village showed to have 200 food plants. The highest number of food plants was found in Khweng village (319 food plants), followed by Marmain (297 food plants), and Umsawar (284 food plants). In terms of districts, the highest mean diversity per village was found in Ri Bhoi (252 food plants), followed by Garo Hills (210 food plants), West Khasi Hills (196 food plants), East Khasi Hills (194 food plants), Nagaland (189 food plants), and Jaintia Hills (175 food plants). In general, the level of local agrobiodiversity can be considered very high. In future studies, the agrobiodiversity levels could be quantified at an individual level and per land area. A household crop inventory would not only assess the total richness but also showed the crop evenness and distribution across the village.

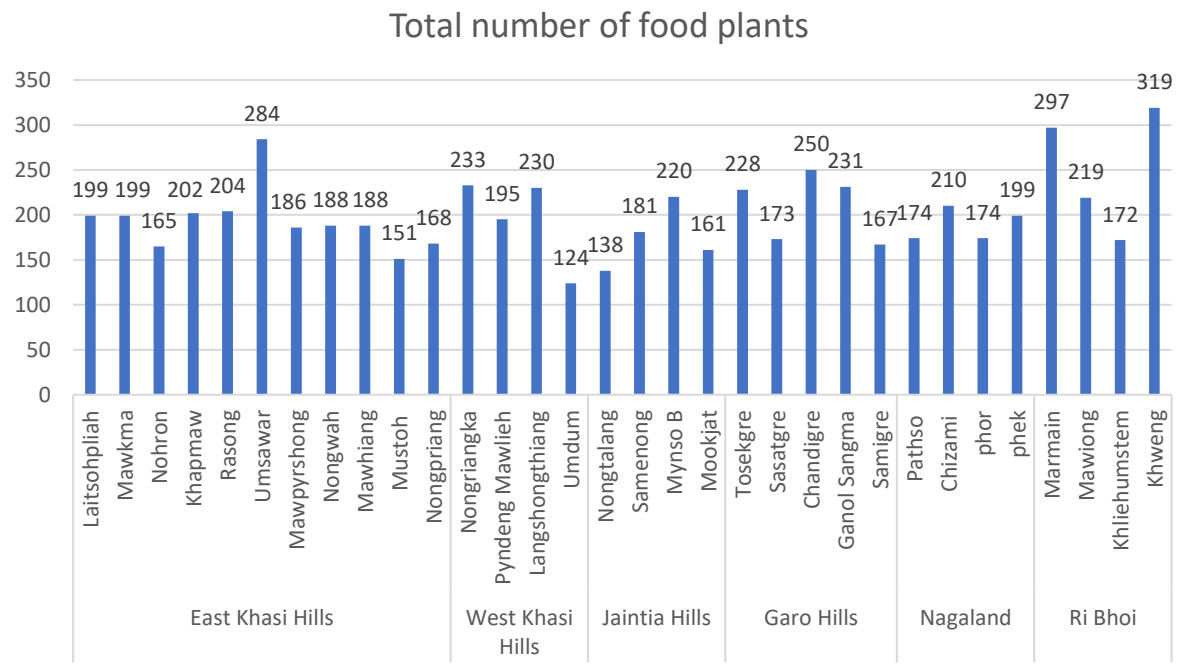

Figure 1 Total number of food plants

Figure 2 expresses the total number of food plants without condiments, which are nutritionally not significant as consumed in small amounts (FAO and FIE, 2016). In this case when condiments excluded, a studied village had 190 food plants on average. Although the diversity is slightly lower now, the most diverse villages remain the same as before, i.e., Khweng village (296 food plants), Marmain (280 food plants), and Umsawar (266 food plants). The mean village diversity per district also remain in the same order, i.e., first Ri Bhoi (235 food plants), followed by Garo Hills (204 food plants), West Khasi Hills (189 food plants), East Khasi Hills (181 food plants), Nagaland (177 food plants), and Jaintia Hills (168 food plants).

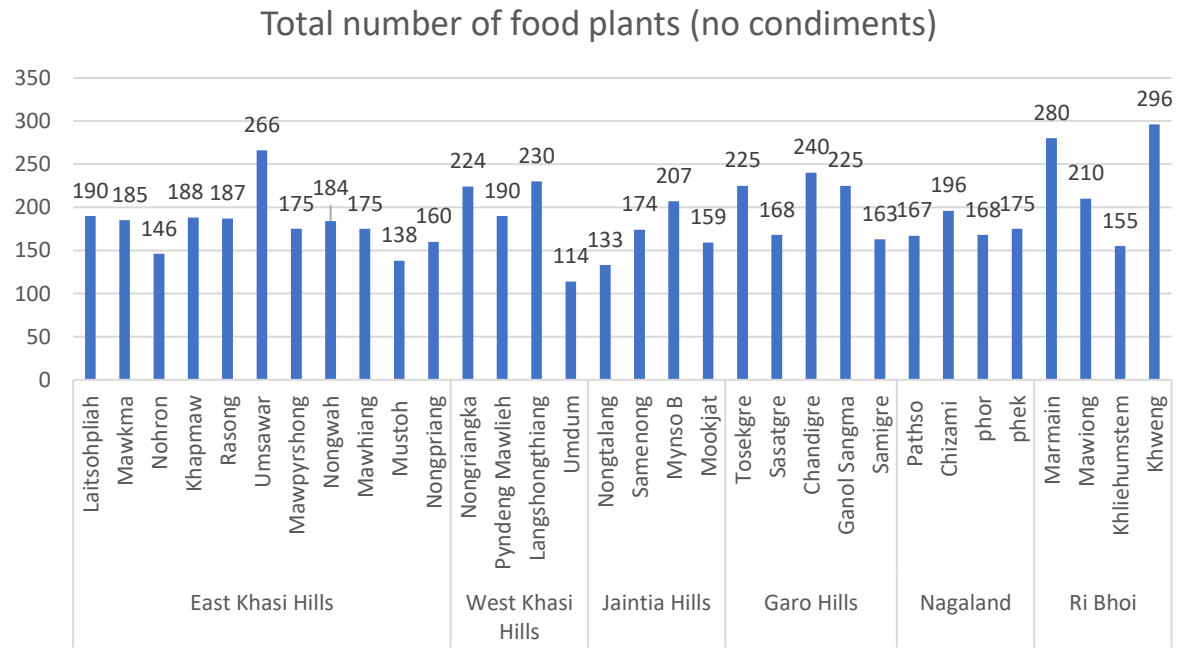

Figure 2 Total number of food plants (no condiments)

If we exclude not only condiments but also mushrooms (as the REC project does not promote mushrooms), the mean number of food plants per village is 174. Without condiments and mushrooms, the most biodiverse villages are still the same with first Khweng (273 food plants), then Marmain (255 food plants), and Umsawar (243 food plants). The mean village diversity within the district also remain in the same order, with Ri Bhoi (216 food plants), followed by Garo Hills (197 food plants), West Khasi Hills (173 food plants), East Khasi Hills (165 food plants), Nagaland (160 food plants), and Jaintia Hills (147 food plants). Generally, we can see that food plant numbers dropped down as edible mushrooms are widely available in all the districts (Figure 3). In the present mapping survey, mushrooms were not being identified and only their vernacular names were captured. A future study could have a more specific lens on edible mushrooms.

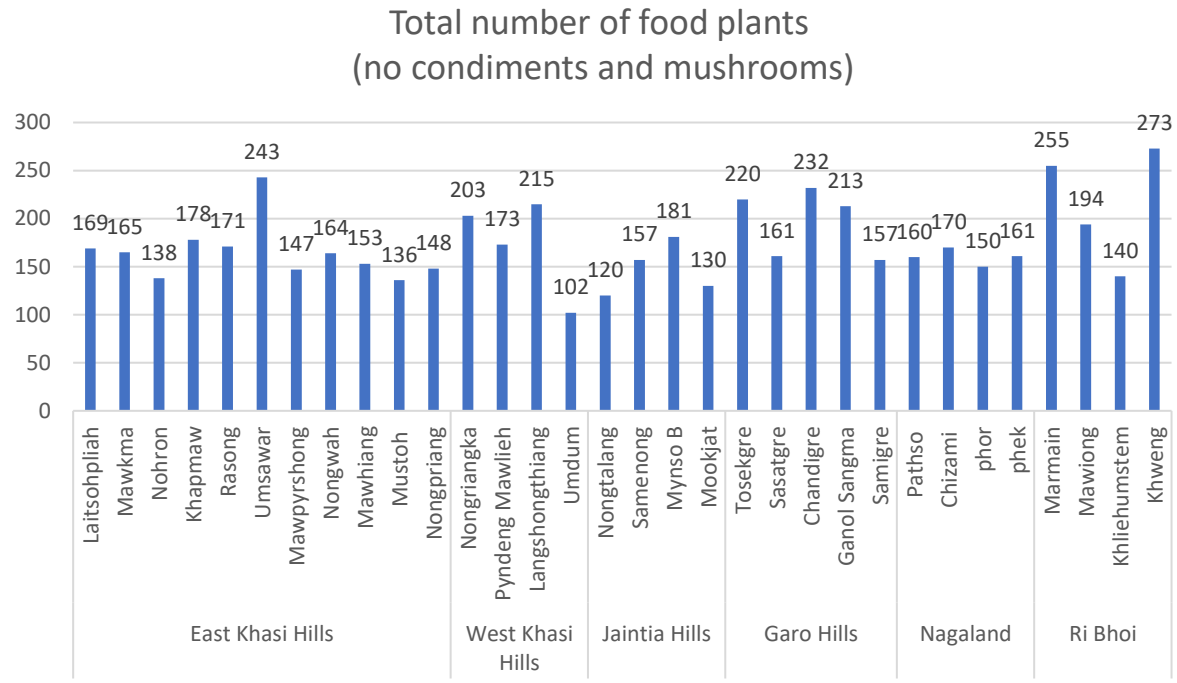

Figure 3 Total number of food plants (without condiments and mushrooms)

In the last situation, when along with condiments and mushrooms we also exclude crop varieties (Figure 4), the mean estimated number of species per village is 124. In this scenario, the order of best diverse villages changed with first being Ganol Sangma (163 species), followed by Umsawar (162 species), and Pathso (157 species). The mean species richness per village within the district turned to be highest for Nagaland (145 species), and subsequently Ri Bhoi (137 species), Garo Hills (125 species), East Khasi Hills (121 species), Jaintia Hills (110 species), and lastly West Khasi Hills (109 species). Despite the apparent decrease in numbers, the number of food plant species are still remarkable. It should be noted, that species richness is a more common and globally recognized indicator of biodiversity.

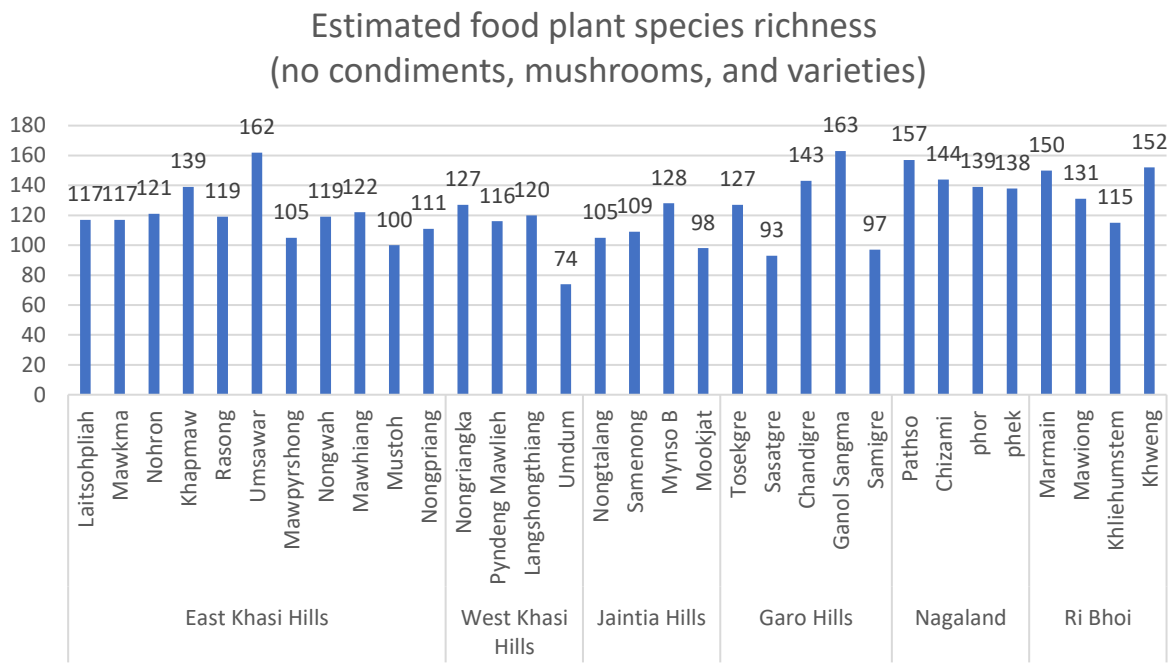

Figure 4 Estimated food plant species richness (no condiments, no mushrooms, and no varieties)

4.2 Agrobiodiversity of starchy staple food plants

Now we will look at the food plant diversity in individual food groups of dietary diversity (FAO and FHI, 2016). First, in Figure 5, we looked at the diversity of starchy staples, which is an important pillar of food sovereignty. The communities still maintain a high diversity of staple food plants, with at least 8 species being used (rice, potato, sweet potato, cassava, taro, tania, maize, wild yams, job´s tears). These species further have several varieties (intraspecific diversity) which were documented. On average, a community in a studied village maintains 33 types of staple food plants. Marmain was the richest village on starchy staples with astounding 82 food plants. Consequent were Chandigre with 64 food plants and Khweng with 61 food plants. Considering the districts, villages in Garo Hills showed to be the richest on starchy staples wit 55 food plants on average. The second was Ri Bhoi (51 food plants), then West Khasi Hills (42 food plants), East Khasi Hills (23 food plants), Jaintia Hills (21 food plants), and Nagaland (19 food plants).

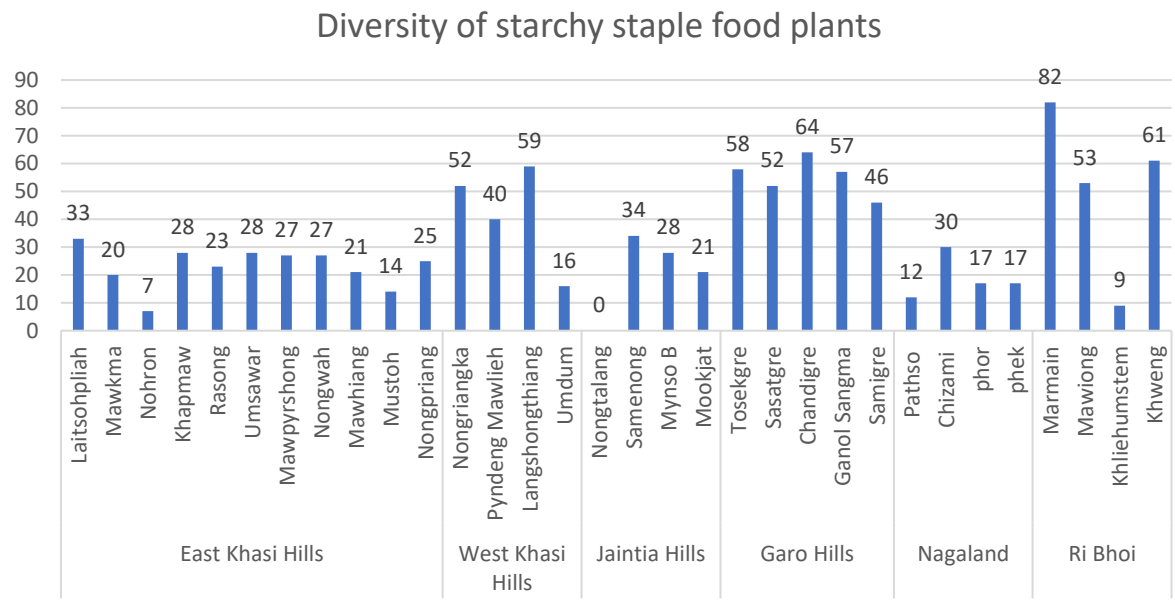

Figure 5 Diversity of starchy staple food plants

4.3 Agrobiodiversity of leafy vegetables

Leafy vegetables are nutritionally fundamental category as they are a rich source of iron, a micronutrient that is consumed in inadequate amounts in North-East India (Chyne et al. 2017), contributing to the prevalence of significant health problem of anemia (Ministry of Health and Family Welfare, 2016). The mean number of leafy vegetables per village in the study area is high, reaching 32 (Figure 6). The villages with the greatest diversity of leafy vegetables were Nongtalang (59 food plants), Khweng and Umsawar (both 45 food plants), and Chizami (42 food plants). Looking at the districts, Nagaland is the richest in this category with a mean number of 38 leafy greens per village. It follows by Ri Bhoi (38 food plants), Jaintia Hills (34 food plants), East Khasi Hills (30 food plants), Garo Hills (29 food plants), and lastly West Khasi Hills (24 food plants).

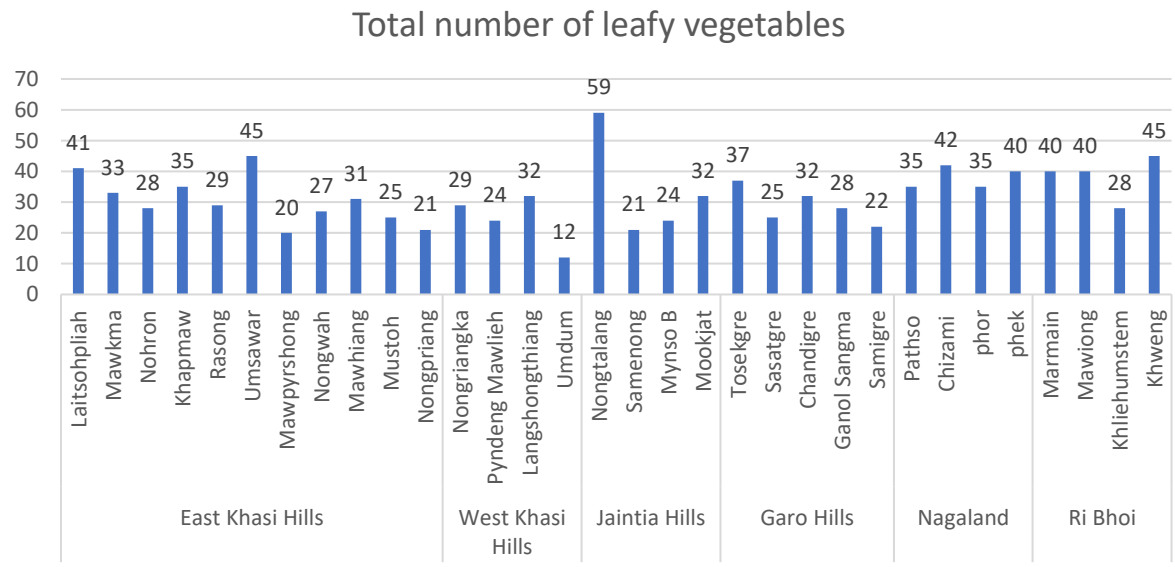

Figure 6 Diversity of leafy vegetables

4.4 Agrobiodiversity of vitamin A-rich fruits and vegetables

Vitamin A-rich plants, meaning orange or dark-yellow fleshed fruits and vegetables (rarely also some staples such as orange sweet potato) are important sources of provitamin A which is converted to vitamin A and absorbed in the human body. Globally, there are only a few plant sources that are rich in vitamin A. Therefore, the potential of these rare but nutritionally remarkable species should be leveraged. Nine vitamin A-rich food plants were found on average per village (Figure 7). Mawkma and Umsawar showed to have the highest diversity of vitamin A-rich plants with 16 and 15 food plants, respectively. District-wise, villages in East Khasi Hills are the richest on this plant category (11 food plants), followed by Ri Bhoi and Jaintia Hills (9 food plants), Nagaland and West Khasi Hills (8 food plants), and lastly Garo Hills (7 food plants).

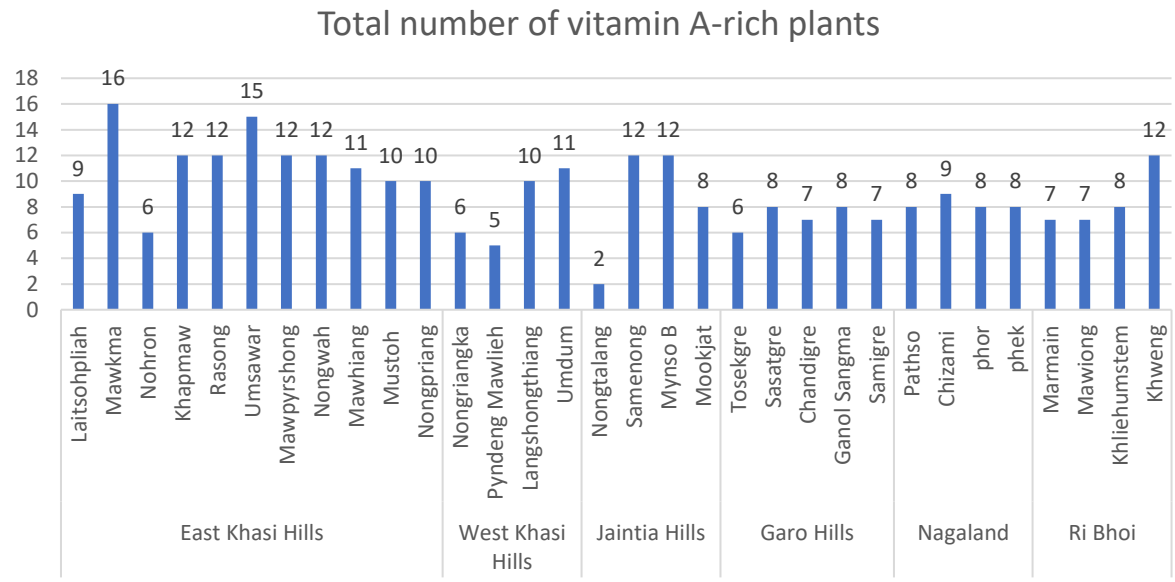

Figure 7 Diversity of vitamin A-rich plants

4.5 Agrobiodiversity of other fruits

The biodiversity of fruits is the highest out of all the food groups. Nevertheless, this extraordinary diversity is vastly underutilized, as we found that other fruits are consumed by just about 25% of the people in the study area (NESFAS, 2019). Yet in a village, a remarkable number of 56 food plants of other fruits were documented on average (Figure 8). The most diverse village was Umsawar (87 food plants), and then Nongriangka and Langshongthiang (78 food plants). As per districts, villages in West Khasi Hills were the most diverse with 64 food plants on average. Afterward, Garo Hills 62 food plants, East Khasi Hills (56 food plants), Nagaland (54 food plants), Ri Bhoi (51 food plants) and Jaintia Hills (47 food plants).

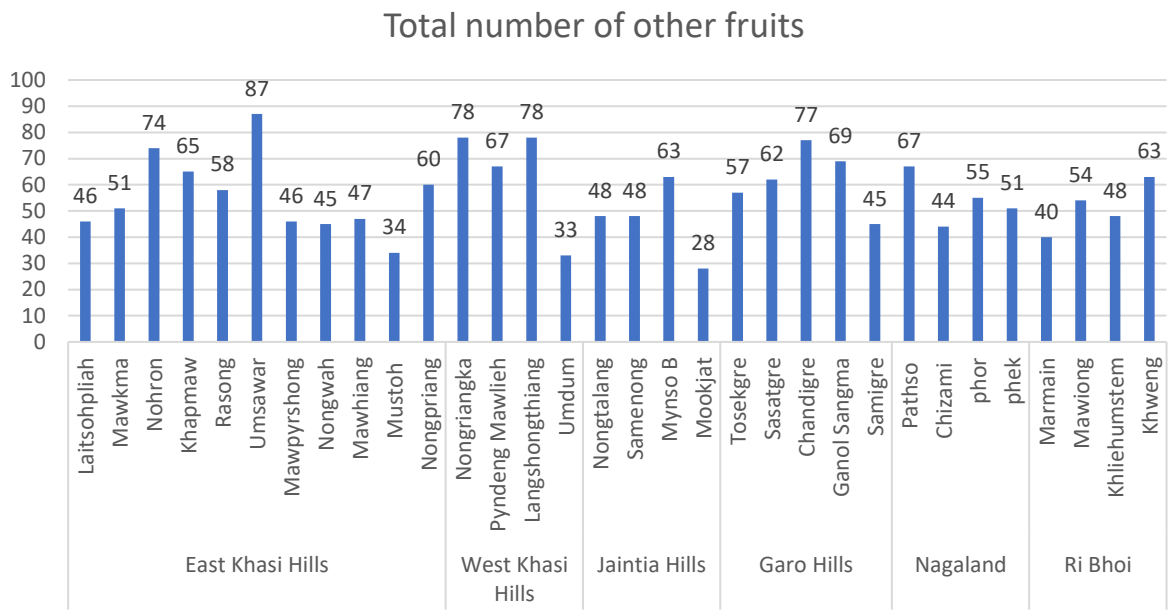

Figure 8 Diversity of other fruits

4.6 Agrobiodiversity of other vegetables

The diversity of other vegetables with a mean of 35 food plants per village is much lower than that of other fruits (Figure 9) but equal to leafy vegetables. Marmain and Khweng, two villages from Ri Bhoi district, showed to have much higher diversity than the rest of the studied villages (72 and 67 food plants, respectively). Villages in Bhoi district thus reached the greatest mean diversity of other vegetables (51 food plants). After that is Garo Hills with 39 food plants, East Khasi Hills with 36 food plants, Jaintia Hills with 26 food plants, West Khasi Hills with 27 food plants, and Nagaland with 26 food plants.

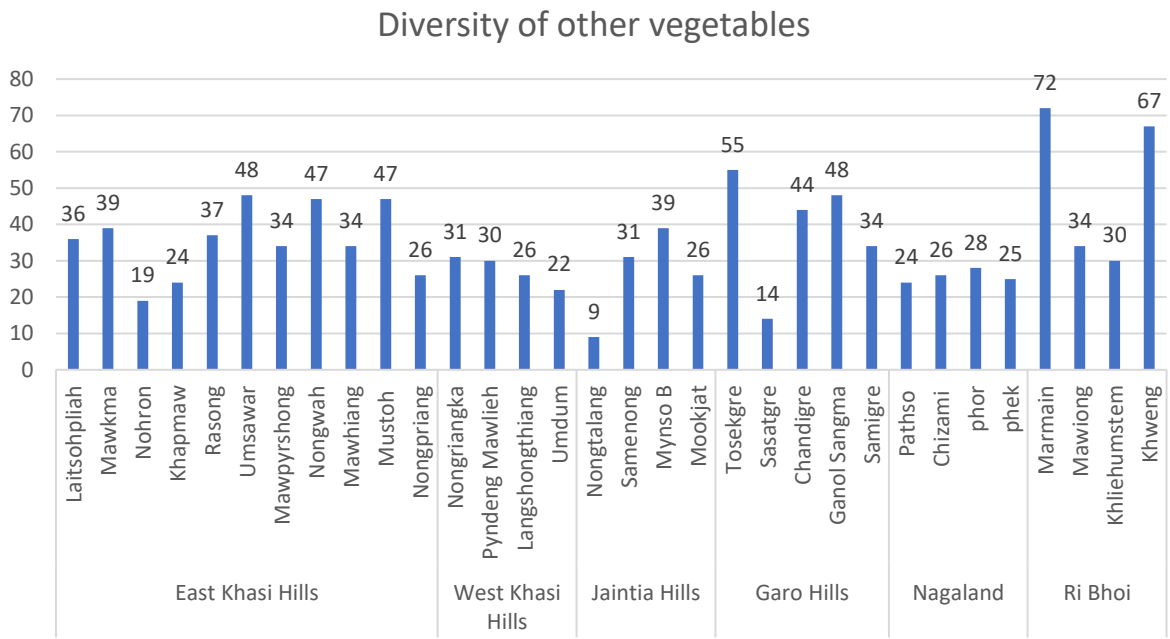

Figure 9 Diversity of other vegetables

4.7 Agrobiodiversity of pulses

The diversity of pulses with a mean of 5 food plants per village is much lower compared to the other food groups (Figure 10). But it is understandable from the community point of view, as local communities consider pulses parts of vegetables. The villages where the greatest diversity of pulses was found were Khweng (15 food plants), and then Phek, Mookjat, and Mynso B (10 food plants). Looking at the districts, the most pulses-diverse villages were found in Jaintia Hills and West Khasi Hills (7 food plants on average), after Nagaland and Ri Bhoi (6 food plants), East Khasi Hills (4 food plants on average), and Garo Hills (3 food plants on average).

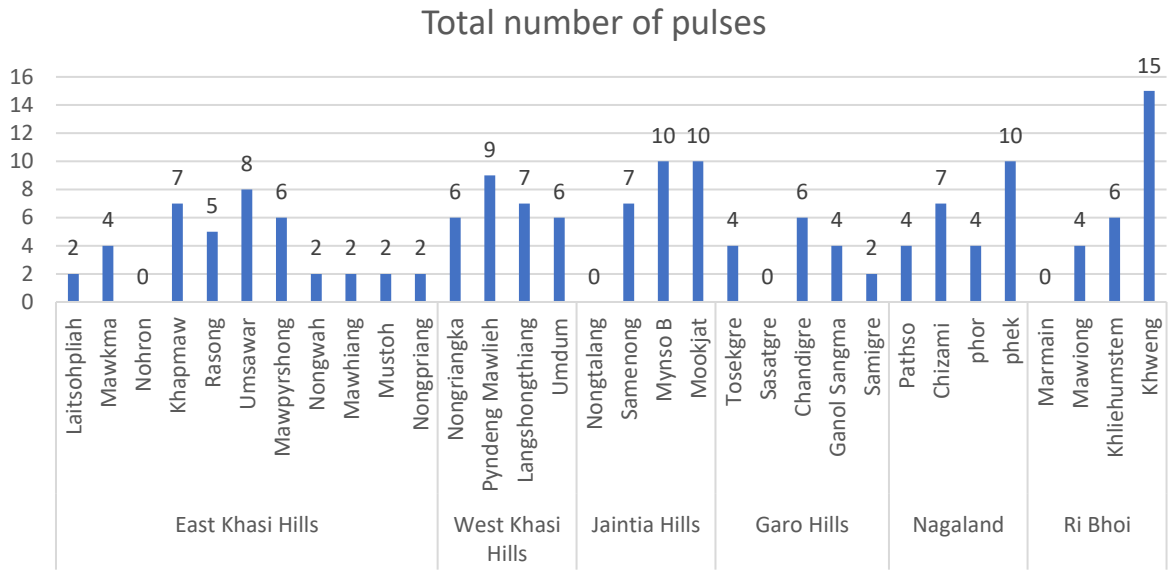

Figure 10 Diversity of pulses

4.8 Agrobiodiversity of nuts and seeds

The mean diversity of nuts and seeds is the same as for pulses, equal to 5 food plants in a village (Figure 11). The villages where the highest diversity of nuts and seeds were Marmain (14 food plants), followed by Chizami (11 food plants), and Pathso, Phek, and Khweng (10 food plants). From a district point of view, the highest mean diversity was identified in Nagaland (9 food plants), Ri Bhoi (7 food plants), East Khasi Hills (5 food plants), Jaintia Hills (4 food plants), West Khasi Hills (3 food plants), and the lowest in Garo Hills (2 food plants).

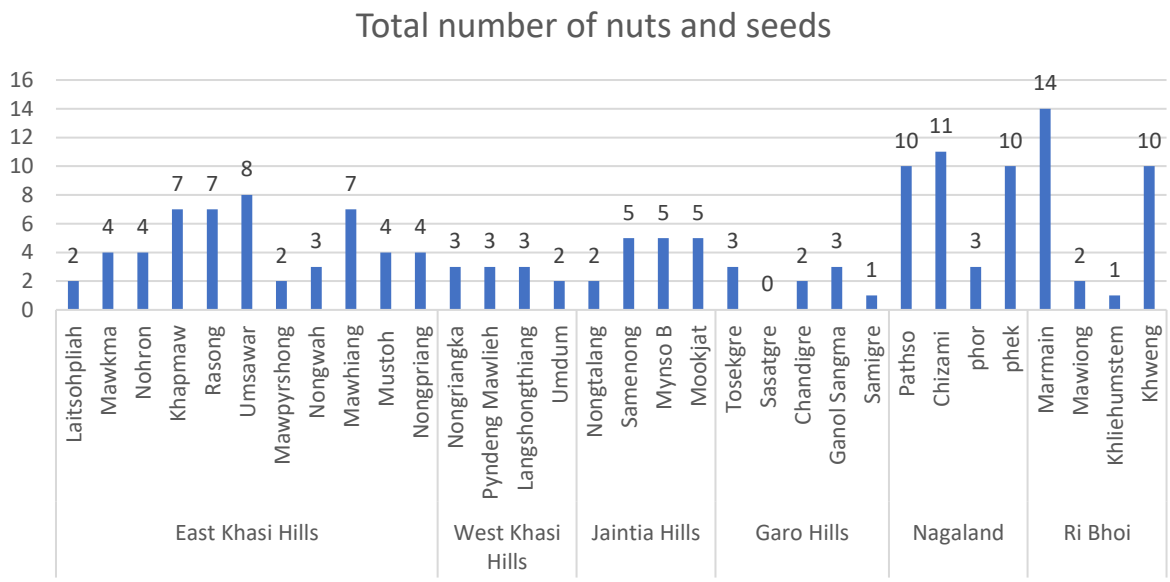

Figure 11 Diversity of nuts and seeds

4.9 Specific results on agrobiodiversity, its seasonality, and participatory rankings

As mentioned in the methodological section, the plant list is not present in the current report, but it is available separately as the excel agrobiodiversity database and agrobiodiversity catalogue, which are being developed by NESFAS with a technical back up from the consultant. Also, the results of agrobiodiversity profile, seasonality calendar with participatory rankings, and prioritized food plants to address the dietary diversity gap are all available for each village in the separate excel sheets submitted to NESFAS. Below is an example of the results for one village (Umsawar):

Table 1 Agrobiodiversity profile of Umsawar village

Umsawar ABD	**Number of food plants**	**Estimated number of species**
starchy staples	28	5
leafy vegetables	45	40
other vegetables (with mushrooms)	71	51
other vegetables (without mushrooms)	48	28
other fruits	87	around 65
vitamin A rich plants	15	14
pulses	8	probably 6
nuts and seeds	8	probably 6
condiments	18	9
Total number of food plants		284
Total number of food plants (no condiments)		266
Total number of food plants (no condiments and mushrooms)		243
Total number of food plant species (no condiments, mushrooms, varieties)		around 194
Total number of food plant species (withouth condiments, mushrooms, but no varieties)		around 162

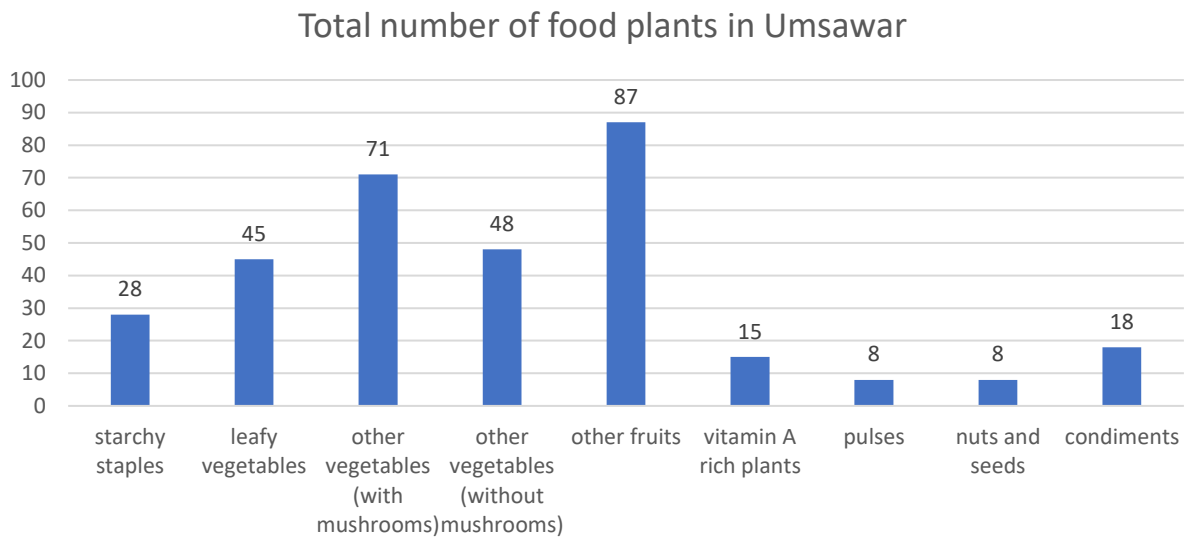

Figure 12 Total number of food plants in Umsawar

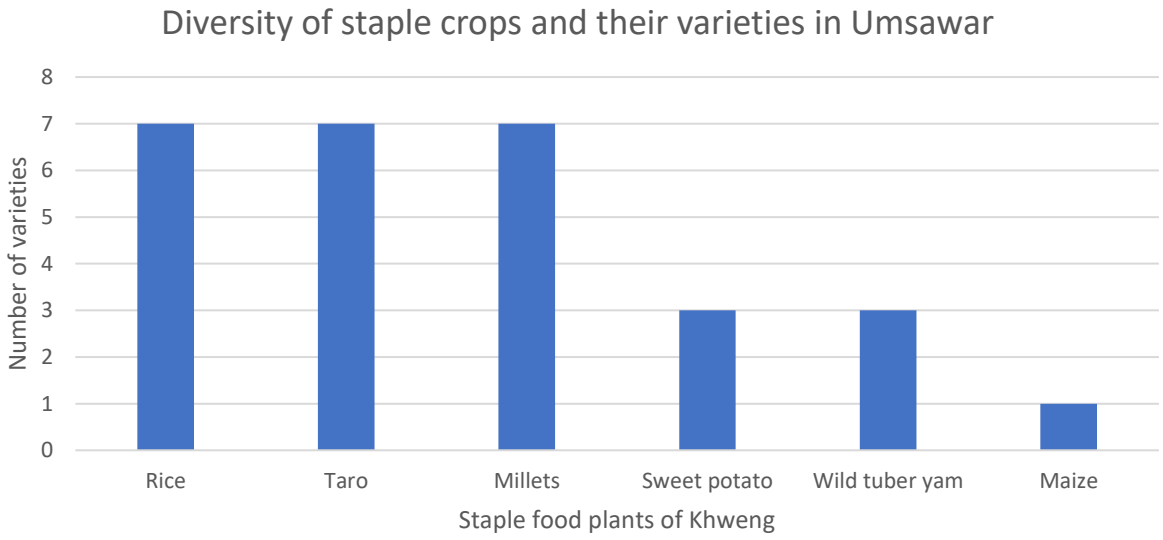

Figure 13 Diversity of starchy food plants in Umsawar

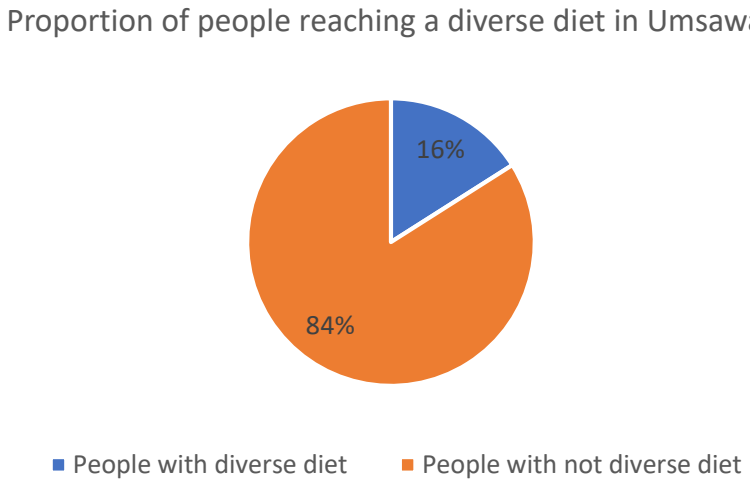

Figure 14 Proportion of respondents consuming a diverse diet in Umsawar

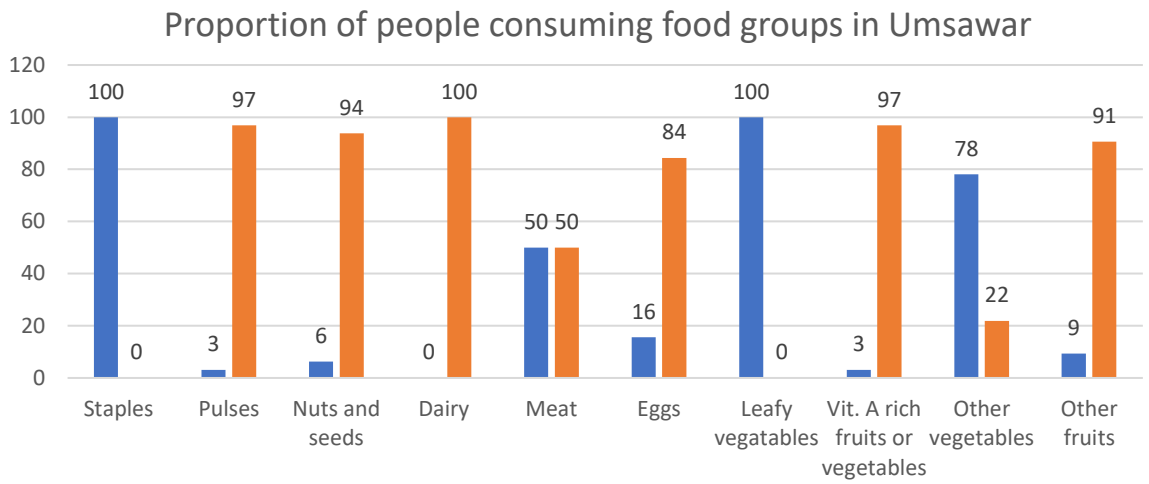

Figure 15 Proportion of respondents consuming particular food groups in Umsawar

Table 2 Food groups prioritized for intervention in Umsawar (based on the dietary diversity results)

Food groups	% of consumers	% of non-consumers	Project scope	Priority order for intervention
starchy staples	100	0	yes	**no need**
pulses	3	97	yes	**1-2.**
nuts and seeds	6	94	yes	**3.**
vitamin A rich plants	3	97	yes	**1-2.**
leafy vegetables	100	0	yes	**no need**
other vegetables	78	22	yes	**5.**
other fruits	9	91	yes	**4.**
meat	50	50	no	**no focus**
eggs	16	84	no	**no focus**
dairy	0	100	no	**no focus**

Table 3 Agrobiodiversity documented in Umsawar along with description, seasonality and results of participatory ranking (ordered according to prioritization)

1. PRIORITY - PULSES	DD group	Description	Plant name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Place/ Source	Abundance	Taste	Seed access	Economic value	Easy cultivation/ collection	Climate resilience	Pest and disease	TOTAL SCORE	INTERVENTION PRIORITY
Cultivated vegetables	Pulses	Beans variety as pulse	Buri													3	3	3	3	2	3	2	1	17	1
Cultivated vegetables	Pulses	Beans variety	Rymbai Syniar													3	2	3	2	3	3	2	2	17	1
Cultivated vegetables	Pulses	Beans variety	Rymbai Shyieng													3,4	2	3	2	3	2	2	2	16	2
Cultivated vegetables	Pulses	Beans variety	Rymbai Siatkhnam													3	2	3	2	3	2	2	2	16	2
Cultivated vegetables	Vegetables - others	Naga french beans	Bean Naga(French Beans)													3	3	2	2	3	2	2	2	16	2
Staple food	Pulses	Rice bean	rymbai ja													1,2,3	2	3	2	2	2	2	2	15	3
Cultivated vegetables	Vegetables - others	Peas	Motor													3,4	2	2	2	3	2	2	2	15	3
Cultivated vegetables	Pulses	Beans variety	Rymbai Japuk													3	2	2	2	3	2	2	2	15	3
Cultivated vegetables	Pulses	Bean variety	Phyrngop													3	2	2	2	2	2	2	2	14	4
Cultivated vegetables	Pulses	Soyabean	Rymbai ktung																					0	missing
2. PRIORITY - VITAMIN A-RICH PLANTS	**DD group**	**Description**	**Plant name**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Place/ Source**	**Abundance**	**Taste**	**Seed access**	**Economic value**	**Easy cultivation/ collection**	**Climate resilience**	**Pest and disease**	**TOTAL SCORE**	**INTERVENTION PRIORITY**
Cultivated vegetables	Vitamin A rich plants	Tree tomato	Sohbaingon Dieng													3,4	3	3	3	3	3	3	3	21	1
Cultivated fruits	Vitamin A rich plants	Mango	Soh Pieng													3	2	3	3	3	3	2	2	18	2
Cultivated vegetables	Vitamin A rich plants	Pumpkin (orange)	Pathaw Saw													3,7(Lum)	3	3	3	3	2	2	1	17	3
Wild fruits	Vitamin A rich plants	Orange when ripe	Soh jaryngsain													7(Forest)	2	3	3	1	2	2	2	15	4
Wild fruits	Vitamin A rich plants	Orange when ripe	Sohnepbah													7(Forest)	2	3	3	1	2	2	2	15	4
Wild fruits	Vitamin A rich plants	Orange when ripe	Sohtymmen													7(Forest)	2	3	2	1	2	2	3	15	4
Wild fruits	Vitamin A rich plants	Orange when ripe	Sohmynlintar													3,7(f)	2	3	2	1	2	3	2	15	4
Cultivated fruits	Vitamin A rich plants	papaya	Soh Kymphor(Rit)													3	2	2	2	2	2	2	3	15	4
Wild fruits	Vitamin A rich plants	Orange when ripe	Soh kro													7(Forest)	1	3	2	1	3	2	2	14	5
Wild fruits	Vitamin A rich plants	Orange when ripe	Sohpamtieh													7(Forest)	2	3	2	1	2	2	2	14	5
Wild fruits	Vitamin A rich plants	Orange when ripe	Sohjyrmi													7(Forest)	2	3	2	1	2	2	2	14	5
Wild fruits	Vitamin A rich plants	Wild mango	Sohpieng khlaw													7(Forest)	2	3	2	1	2	2	2	14	5
Wild fruits	Vitamin A rich plants	Orange when ripe	Sohrangsain													7(Forest)	2	2	2	1	2	2	2	13	6

Cultivated fruits	Vitamin A rich plants	Bastard oleaster	Soh Shang													1,3	2	2	2	2	1	2	2	13	7
Wild fruits	Vitamin A rich plants	Bastard oleaster	Sohshan													7(Forest)	1	3	2	1	2	2	1	12	8
3. NUTS AND SEEDS	**DD group**	**Description**	**Plant name**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Place/ Source**	**Abundance**	**Taste**	**Seed access**	**Economic value**	**Easy cultivation/ collection**	**Climate resilience**	**Pest and disease**	**TOTAL SCORE**	**INTERVENTION PRIORITY**
Cultivated vegetables	nuts and seeds	Perilla	Nei Iong													3	3	3	3	3	3	2	2	19	1
Wild fruits	nuts and seeds	Chestnut	Soh ot nicob													7(Forest)	3	3	3	2	3	3	2	19	1
Wild fruits	nuts and seeds	Chestnut	Soh ot diengsning													7(Forest)	3	3	3	2	3	3	2	19	1
Wild fruits	nuts and seeds	Chestnut	Soh ot laidong													7(Forest)	3	3	3	2	3	2	2	18	2
Wild fruits	nuts and seeds	Chestnut	Soh ot diengtarsaw													7(Forest)	2	3	3	2	3	3	2	18	2
Cultivated vegetables	nuts and seeds	Black sesame	Nei Dem/ Lieh													3	3	3	3	3	2	2	1	17	3
Wild fruits	nuts and seeds	Chestnut	Soh ot makaleng													7(Forest)	2	3	3	2	3	3	1	17	3
Wild fruits	nuts and seeds	Gynocardia odorata	Sohling/liang													7(Forest)	2	3	2	3	1	2	3	16	4
4. OTHER FRUITS	**DD group**	**Description**	**Plant name**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Place/ Source**	**Abundance**	**Taste**	**Seed access**	**Economic value**	**Easy cultivation/ collection**	**Climate resilience**	**Pest and disease**	**TOTAL SCORE**	**INTERVENTION PRIORITY**
Cultivated vegetables	Fruits - Others	Citrus fruit with white flesh	Sohkymphor													3	3	3	3	3	3	3	3	21	1
Cultivated vegetables	Fruits - Others	Citrus	Sohjew Myriang													3	2	3	3	3	3	3	3	20	2
Cultivated vegetables	Fruits - Others	Small Citrus fruit with white flesh	Soh Jallia													3	2	3	3	3	3	3	3	20	2
Cultivated fruits	Fruits - Others	Pomelo	Soh Ball/Bah Red													1,3,7	3	3	3	3	3	3	2	20	2
Cultivated fruits	Fruits - Others	Lemon variety	Soh Jen													3	3	2	3	3	3	3	2	19	3
Cultivated fruits	Fruits - Others	pineapple	Pineapple Small													1,3	3	3	3	3	3	2	2	19	3
Cultivated fruits	Fruits - Others	Banana	Kait Jaji													3	3	3	3	3	3	2	2	19	3
Cultivated fruits	Fruits - Others	Bay berry	Soh Phie													1,2,3	3	2	3	3	3	3	2	19	3
Cultivated fruits	Fruits - Others	Plum/berry	Soh Iong													1,2,3	3	3	3	2	3	3	2	19	3
Wild fruits	Fruits - Others	Bay Berry green	Sohphie heh													7(Forest)	3	3	3	2	3	2	2	18	4
Wild fruits	Fruits - Others	Bay Berry	sohphie rit													7(Forest)	3	3	3	2	3	2	2	18	4
Cultivated fruits	Fruits - Others	Like orange but white when ripe	Soh Blenceia White													3	3	3	2	3	3	2	2	18	4
Cultivated fruits	Fruits - Others	jackfruit	Soh Phan/Ram													3	3	2	3	3	3	2	2	18	4

Cultivated fruits	Fruits - Others	jackfruit	Soh Phan													3	3	3	3	3	2	2	2	18	4
Cultivated fruits	Fruits - Others	Banana	Kait Syiem													2,3	3	3	2	2	3	2	3	18	4
Cultivated fruits	Fruits - Others	Banana	Kait Cement													3	2	3	3	2	3	2	3	18	4
Wild fruits	Fruits - Others	Bay Berry red	Sohphie nam													7(Forest)	2	3	3	2	3	2	2	17	5
Wild fruits	Fruits - Others	Bay Berry red	sohphie liya													7(Forest)	2	3	3	2	3	2	2	17	5
Cultivated fruits	Fruits - Others	white flesh, sour)	Soh Ramen													3	2	2	2	3	3	3	2	17	5
Cultivated fruits	Fruits - Others	Guava variety	Soh Pyrem Bilad													3	2	2	3	3	3	2	2	17	5
Cultivated fruits	Fruits - Others	white in colour	Soh Khia(Kwai)													3	3	2	3	3	2	2	2	17	5
Cultivated fruits	Fruits - Others	Banana	Kait Ja													3,2	3	3	2	2	3	2	2	17	5
Cultivated fruits	Fruits - Others	Banana	Khit Klong													2,3	2	2	3	2	3	2	3	17	5
Cultivated fruits	Fruits - Others	Banana	Kait Kaji													3	2	2	3	2	3	2	3	17	5
Staple food	Fruits - Others	banana	kait thang													1,3	2	3	3	2	2	2	2	16	6
Wild fruits	Fruits - Others	Blackish blue when ripe	Sohlangskei													1,7(Forest)	3	3	3	1	2	2	2	16	6
Wild fruits	Fruits - Others	Reddish when ripe	Sohkhlur													7(Forest)	2	3	2	1	3	2	3	16	6
Cultivated fruits	Fruits - Others	Guava variety	Soh Pyrem(Lieh)													3	3	2	2	2	3	2	2	16	6
Cultivated fruits	Fruits - Others	Orange	Sohniamtra													3	2	3	2	2	2	3	2	16	6
Cultivated fruits	Fruits - Others	Citrus fruit white flesh	Soh Kynphor(Lieh)													3	2	2	2	2	3	2	3	16	6
Cultivated fruits	Fruits - Others	plum	Soh Plum Nam													3	2	2	2	3	3	2	2	16	6
Cultivated fruits	Fruits - Others	Pear	Soh Phoh Nongkhlaw													1,3	2	3	2	2	3	2	2	16	6
Cultivated fruits	Fruits - Others	Lemon variety	Lemon													2,3	3	2	2	2	3	2	2	16	6
Cultivated fruits	Fruits - Others	Red colour when ripe	Soh Lyngie													3	3	3	2	2	2	2	2	16	6
Cultivated fruits	Fruits - Others	Banana	Kait Pathaw													3	2	2	2	2	3	2	3	16	6
Wild fruits	Fruits - Others	Blackish blue when ripe	Soheitblang													1,37(Forest)	3	3	3	1	2	1	2	15	7
Wild fruits	Fruits - Others	orange in colour when fully ripe	Sohrapung													7(Forest)	2	3	3	1	2	2	2	15	7
Wild fruits	Fruits - Others	Red when ripe	Sohryngkham													1,7(Forest)	3	3	2	1	2	2	2	15	7
Wild fruits	Fruits - Others	Rattan fruit	Sohthri(miet)													7(Forest)	2	3	2	1	2	2	3	15	7
Cultivated fruits	Fruits - Others	Guava variety	Soh Pyrem(Saw)													3	3	1	2	2	3	2	2	15	7
Cultivated fruits	Fruits - Others	Plum	Soh Plum(Lieh)													1,3	2	3	2	2	2	2	2	15	7
Cultivated fruits	Fruits - Others	plum	Soh Plum (Saw)													3	2	3	2	2	2	2	2	15	7

Cultivated fruits	Fruits - Others	Star fruit	Soh Pyrshong Jew													3	1	2	2	3	2	2	3	15	7
Cultivated fruits	Fruits - Others	?	Soh Jam(Jang)													3	2	2	2	2	3	2	2	15	7
Wild fruits	Fruits - Others	black colour	Soh khaw iong													7(Forest)	2	3	2	1	2	2	2	14	8
Wild fruits	Fruits - Others	Black when ripe with thorns	Sohpuiongkhiew													7(Forest)	2	3	2	1	2	2	2	14	8
Wild fruits	Fruits - Others	Red when ripe	Sohkhmut													7(Forest)	2	3	2	1	2	2	2	14	8
Wild fruits	Fruits - Others	Probably citrus	Sohnarlang													7(Forest)	2	3	2	1	2	2	2	14	8
Wild fruits	Fruits - Others	Creamish when ripe	Sohlyngkait													7(Forest)	2	3	2	1	2	2	2	14	8
Wild fruits	Fruits - Others	Rattan fruit	Sohthri													7(Forest)	2	3	2	1	2	2	2	14	8
Wild fruits	Fruits - Others	Red when is not fully ripe, Black when fully ripe	Soh um stem													7(Forest)	2	3	2	1	2	2	2	14	8
Wild fruits	Fruits - Others	blackish blue when ripe	soh um iong													7(Forest)	2	3	2	1	2	2	2	14	8
Wild fruits	Fruits - Others	blackish blue when ripe	Soh rang um iong													7(Forest)	2	3	2	1	2	2	2	14	8
Wild fruits	Fruits - Others	blackish blue when ripe	Sohiong shrieh													7(Forest)	2	3	2	1	2	2	2	14	8
Wild fruits	Fruits - Others	White when ripe	Sohkhah rit													7(Forest)	2	3	2	1	2	2	2	14	8
Wild fruits	Fruits - Others	White when ripe	Sohkhah heh													7(Forest)	2	3	2	1	2	2	2	14	8
Wild fruits	Fruits - Others	Like pear but smaller	Sohphoh jngan													3,7(f)	2	3	2	1	2	2	2	14	8
Wild fruits	Fruits - Others	Black when ripe	Sohkseh blei													7(Forest)	2	3	2	1	2	2	2	14	8
Wild fruits	Fruits - Others	Pink when ripe	Sohthylling													7(Forest)	2	3	2	1	2	2	2	14	8
Wild fruits	Fruits - Others	Red colour when ripe	Sohlyngi													7(Forest)	2	3	2	1	2	2	2	14	8
Wild fruits	Fruits - Others	Citrus fruit white flesh	Soh nongrim													7(Forest)	2	3	2	1	2	2	2	14	8
Wild fruits	Fruits - Others	?	Sohryngkiah													7(Forest)	2	3	2	1	2	2	2	14	8
Wild fruits	Fruits - Others	like a guava, white in colour whhen ripe	Sohklong													7(Forest)	2	3	2	1	2	2	2	14	8
Wild fruits	Fruits - Others	Yellowish when ripe	Sohpaitpurow													7(Forest)	2	3	2	1	2	2	2	14	8
Wild fruits	Fruits - Others	Yellowish when ripe	Sohksuit													7(Forest)	2	3	2	1	2	2	2	14	8
Wild fruits	Fruits - Others	White flesh	Sohpian													7(Forest)	2	3	2	1	2	2	2	14	8
Wild fruits	Fruits - Others	Shining white when ripe	Sohtyrkhang													7(Forest)	2	3	2	1	2	2	2	14	8
Cultivated fruits	Fruits - Others	Pear	Soh Phoh Shnuih													1,3	2	2	2	2	2	2	2	14	8

Wild fruits	Fruits - Others	White when ripe	Soh nub												7(Forest)		2	2	3	2	2	2	13	9
Wild fruits	Fruits - Others	Red when ripe	Sohkhwiang												7(Forest)	2	3	2	1	1	2	2	13	9
Wild fruits	Fruits - Others	Pink when ripe	Sohlympit												7(Forest)	2	2	2	1	2	2	2	13	9
Wild fruits	Fruits - Others	Like pear	Sohshiahshur												7(Forest)	2	2	2	1	2	2	2	13	9
Wild fruits	Fruits - Others	Yellowish when ripe	Sohpdung												7(Forest)	2	2	2	1	2	2	2	13	9
Wild fruits	Fruits - Others	Wild pear	Sohbtet												7(Forest)	2	2	2	1	2	2	2	13	9
Wild fruits	Fruits - Others	Black when ripe	Sohnaruin												7(Forest)	2	2	2	1	2	2	2	13	9
Wild fruits	Fruits - Others	Black when ripe	Sohjabuit												7(Forest)	2	2	2	1	2	2	2	13	9
Cultivated fruits	Fruits - Others	pomegranate	Pomegranate													1	2	1	2	3	2	2	13	9
Cultivated fruits	Fruits - Others	passion fruit	Soh Brap												1,2,3	2	2	2	1	2	2	2	13	9
Cultivated fruits	Fruits - Others	Litchi	Soh Manir												3	1	2	1	2	2	2	2	12	10
Cultivated fruits	Fruits - Others	Sugarcane	Pie Saw(Sugarcane)												3	1	2	1	1	2	2	3	12	10
Cultivated fruits	Fruits - Others	Pear	Soh Phoh Plet												3	2	2	2	1	2	2	1	12	10
Cultivated fruits	Fruits - Others	Lemon	Soh Bangja												3	2	2	2	1	2	2	1	12	10
Cultivated fruits	Fruits - Others	Sugarcane	Pie Lieh												3	1	2	1	1	2	2	2	11	11
Cultivated fruits	Fruits - Others	watermellon	Watermelon												3	2	1	1	1	1	2	2	10	12
Cultivated fruits	Fruits - Others	strawberry	Strawberry												3,2,1	2	2	1	1	1	1	1	9	13
Cultivated fruits	Fruits - Others	Citrus	Soh Bang																				0	missing
Cultivated fruits	Fruits - Others	Mulberry	Soh Langdkhur																				0	missing
5. OTHER VEGETABLES	**DD group**	**Description**	**Plant name**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Place/ Source**	**Abundance**	**Taste**	**Seed access**	**Economic value**	**Easy cultivation/ collection**	**Climate resilience**	**Pest and disease**	**TOTAL SCORE**	**INTERVENTION PRIORITY**
Cultivated vegetables	Vegetables - others	Redish when ripe	Sohthangkalor													3	3	3	3	3	3	3	2	20	1
Cultivated vegetables	vegetables - others	eggplant varieties	Sohbaingon Pylleng													3,4	3	3	3	3	3	3	2	20	1
Cultivated vegetables	vegetables - others	eggplant varieties	Sohbaingon Jyrngam													3,4	3	3	3	3	3	3	2	20	1
Cultivated vegetables	vegetables - others	eggplant varieties	Sohbaingon Pyllon													3,4	3	3	3	3	3	3	2	20	1
Cultivated vegetables	vegetables - others	eggplant varieties	Sohbaingon Rit													3,4	3	3	3	3	3	3	2	20	1
Cultivated vegetables	vegetables - others	eggplant varieties	Sohbaingon Kthang													3,4	3	3	3	3	3	3	2	20	1
Cultivated vegetables	vegetables - others	eggplant varieties	Sohbaingon Lieh													3,4	3	3	3	3	3	3	2	20	1
Cultivated vegetables	Vegetables - others	bottle gourd	Klong Jrong													3	2	3	3	3	3	3	3	20	1

Cultivated vegetables	Vegetables - others	Cucumber variety	Sohkhia Heh													3	3	3	3	3	3	2	2	19	2
Cultivated vegetables	Vegetables - others	bitter gouard	Kerala													3	3	3	3	3	3	2	2	19	2
Cultivated vegetables	Vegetables - others	Lady's finger variety	Byndi-Lieh													3	3	3	3	3	3	2	2	19	2
Cultivated vegetables	Vegetables - others	Edible flower	Lapang-Murit													3,7	3	3	3	2	3	3	2	19	2
Cultivated vegetables	vegetables - others	Taro stem	Wang Dok													2,3	3	3	3	3	3	2	2	19	2
Cultivated vegetables	vegetables - others	Taro stem	Wang Khap													2,3,4	3	3	3	3	3	2	2	19	2
Cultivated vegetables	vegetables - others	Taro stem	Wang Panai													2,3,4	3	3	3	3	3	2	2	19	2
Cultivated vegetables	vegetables - others	Taro stem	Wang Maida													2,3	3	3	3	3	3	2	2	19	2
Cultivated vegetables	vegetables - others	eggplant varieties	Sohbaingon Hadem													3,4	3	3	3	3	3	2	2	19	2
Cultivated vegetables	vegetables - others	eggplant varieties	Sohbaingon Iong													3,4	3	3	3	3	3	2	2	19	2
Cultivated vegetables	vegetables - others	eggplant varieties	Sohbaingon Saw													3,4	3	3	3	3	3	2	2	19	2
Cultivated vegetables	vegetables - others	eggplant varieties	Sohbaingon Stem													3,4	3	3	3	3	3	2	2	19	2
Cultivated vegetables	vegetables - others	Solanum indicum - bittter eggplant	Sohngang Soh													3	3	2	2	3	3	3	3	19	2
Cultivated vegetables	Vegetables - others	bottle gourd	Klong Pyllon													3	2	3	3	3	3	3	2	19	2
Cultivated vegetables	Vegetables - others	bottle gourd	Klong Lyngkot													3	2	3	3	3	3	3	2	19	2
Wild vegetables	Vegetables - others	bamboo shoot	Lungrnai													1,7(f)	2	3	2	2	3	3	3	18	3
Cultivated vegetables	Vegetables - others	Cucumber variety	Sohkhia Rit													3	2	3	3	3	3	2	2	18	3
Wild vegetables	vegetables - others	Banana flower	Pashor													3,7 (Forest)	2	2	3	3	3	3	1	17	4
Wild vegetables	vegetables - others	Banana flower	Padung													7 (Forest)	2	2	3	3	2	3	2	17	4
Wild vegetables	Vegetables - others	bamboo shoot	Lungsiej													7(f)	2	2	2	2	3	3	3	17	4
Wild vegetables	Vegetables - others	bamboo shoot	Lung kthang													7(f)	2	3	2	2	2	3	3	17	4
Wild vegetables	Vegetables - others	bamboo shoot	Lung shken													7(f)	2	3	2	2	2	3	3	17	4
Wild vegetables	Vegetables - others	vegetables redish green colour	Lung shahkrot													7(f)	3	2	2	2	2	3	3	17	4
Cultivated vegetables	Vegetables - others	Pumpkin with white flesh	Pathaw Ksing													3	3	3	3	3	2	2	1	17	4
Cultivated vegetables	Vegetables - others	Squash (white flesh)	Biscot Shiah													3	3	3	2	3	2	2	2	17	4
Cultivated vegetables	Vegetables - others	Manipur french beans	Bean Manipur(French Beans)													3	3	3	2	3	2	2	2	17	4
Cultivated vegetables	vegetables - others	Taro stem	Wang Kwai													2,3,4	3	3	2	3	2	2	2	17	4

Cultivated vegetables	vegetables - others	Solanum indicum - bittter eggplant	Sohngang Hati													3,4	3	2	2	1	3	3	3	17	4
Wild mushrooms	Vegetables - others	mushroom	Tit tung													7(Forest)	2	3	2	3	3	3	1	17	4
Cultivated vegetables	Vegetables - others	Pumpkin (White flesh)	Pathaw Lieh													3	2	3	3	3	2	2	1	16	5
Cultivated vegetables	Vegetables - others	Squash (dark green)	Biscot(Dark Green)													3	2	3	2	3	2	2	2	16	5
Cultivated vegetables	Vegetables - others	Squash (light green)	Biscot(Light Green)													3	2	3	2	3	2	2	2	16	5
Cultivated vegetables	Vegetables - others	Lady's finger variety	Byndi-Saw													3	2	3	2	3	2	2	2	16	5
Cultivated vegetables	Vegetables - others, pulses	Naga french beans	Bean Naga(French Beans)													3	3	2	2	3	2	2	2	16	5
Wild mushrooms	Vegetables - others	mushroom	tit slung													7(Forest)	2	3	2	3	3	2	1	16	5
Wild vegetables	vegetables - others	Red when ripe	Sohshit													7(f)	2	2	2	1	2	3	3	15	6
Cultivated vegetables	Vegetables - others	spring onion	Jyllang													3	2	3	2	2	2	2	2	15	6
Cultivated vegetables	Vegetables - others, pulses	Peas	Motor													3,4	2	2	2	3	2	2	2	15	6
Cultivated vegetables	vegetables - others	Taro stem	Wang Phyrnap													2,3	3	3	1	3	2	2	1	15	6
Wild vegetables	Vegetables - others	bitter gouard	Kerela (khlaw)													1,7(f)	1	2	1	2	2	3	3	14	7
Wild fruits	vegetables - others	like a turnip, the fruit is black in colur	Sohmiaw													7(Forest)	2	3	2	1	2	2	2	14	7
Wild fruits	vegetables - others	Tuber white when ripe	sohkhah													7(Forest)	2	3	2	1	2	2	2	14	7
Wild mushrooms	Vegetables - others	mushroom	Tit kur saw													7(Forest)	2	3	2	1	3	2	1	14	7
Wild mushrooms	Vegetables - others	mushroom	Tit jwat													7(Forest)	2	3	2	1	3	2	1	14	7
Wild mushrooms	Vegetables - others	mushroom	Tit Roit													7(Forest)	2	3	2	1	3	2	1	14	7
Wild mushrooms	Vegetables - others	mushroom	tit langnuih													7(Forest)	2	3	2	1	3	2	1	14	7
Wild mushrooms	Vegetables - others	mushroom	Tit maraw													3,7(Forest)	2	3	2	1	3	2	1	14	7
Wild mushrooms	Vegetables - others	mushroom	Tit tangdong													7(Forest)	2	3	2	1	3	2	1	14	7
Wild mushrooms	Vegetables - others	mushroom	Tit lap													3,4,7(Forest)	2	3	2	1	3	2	1	14	7
Wild mushrooms	Vegetables - others	mushroom	Tit sier													7(Forest)	2	3	2	1	3	2	1	14	7
Wild mushrooms	Vegetables - others	mushroom	Tit lieh													7(Forest)	2	3	2	1	3	2	1	14	7
Wild mushrooms	Vegetables - others	mushroom	tit kjatsyiar													7(Forest)	2	3	2	1	3	2	1	14	7
Wild mushrooms	Vegetables - others	mushroom	Tit eitmasi													3,7(Forest)	2	3	2	1	3	2	1	14	7
Wild mushrooms	Vegetables - others	mushroom	tit ktem													7(Forest)	2	3	2	1	3	2	1	14	7

Wild mushrooms	Vegetables - others	mushroom	Tit nai													7(Forest)	2	3	2	1	3	2	1	14	7
Wild mushrooms	Vegetables - others	mushroom	Tit sning													7(Forest)	2	3	2	1	3	2	1	14	7
Wild mushrooms	Vegetables - others	mushroom	Tit jymbo													7(Forest)	2	3	2	1	3	2	1	14	7
Wild mushrooms	Vegetables - others	mushroom	Tit sia													7(Forest)	2	3	2	1	3	2	1	14	7
Wild mushrooms	Vegetables - others	mushroom	Tit kseh													7(Forest)	2	3	2	1	3	2	1	14	7
Wild mushrooms	Vegetables - others	mushroom	tit khoh													7(Forest)	2	3	2	1	3	2	1	14	7
Wild mushrooms	Vegetables - others	mushroom	Tit kur iong													7(Forest)	2	3	2	1	3	2	1	14	7
Wild mushrooms	Vegetables - others	mushroom	Tit sohmen													7(Forest)	2	3	2	1	3	2	1	14	7
Wild mushrooms	Vegetables - others	mushroom	tit khohshot													7(Forest)	2	3	2	1	3	2	1	14	7
Cultivated vegetables	Vegetables - others	lettuce	Salad													2,3	2	1	2	2	2	1	2	12	8
Cultivated vegetables	Vegetables - others	Squash	Biscot Shniuh													3	3							3	9
Cultivated vegetables	Vegetables - others	Sponge gourd variety	Sohparew Riangmuid													3,4								0	missing

5. Challenges and lessons learned

5.1 Challenges during data collection

- During FGD, one plant food group was confusing (Staple food plants), under which in many cases people mixed all commonly consumed plants including not only starchy staples but also vegetables and fruits. Next time we shall thus use the alternative name for this food group ´Starchy staples´ and in brackets (grains, tubers).
- Challenge is that local people have a different perception and categorization of what is fruit and what is vegetable. Often, vegetables which have edible plant part – fruit, are considered fruits (e.g. Klong, Pathaw, cucumber), this needs guidance by the facilitator.
- If the resources available in the market are not mapped, some nutritious plants and foods consumed by the community might be missed (e.g. nei lieh, nei iong).
- The ranking was not done thoroughly in some cases, for example in Garo Hills, where many plants or whole categories have the same rank.
- Data enumerators often made mistakes in spelling and writing of local plant names. This led to confusion during data analysis, and additional cross-checking was required.

5.2 Challenges during data analysis

- Post-fieldwork recategorization of plants from local categories into standard food categories was challenging, especially as a different person than enumerator did re-categorization, and as the photos and specimens were not yet available.
- Creating a plant database and aggregating plant identity at the species level from different ethnic languages is challenging. This requires good skills of botany, plant pictures, and a particularly good understanding of local languages.
- The entry of data by data entry operator was very useful, but some plants in the sheets of seasonal calendars were spread over two rows, which had to be removed for analysis of ranking into a single row.
- Plant identification to English and Latin names has been done to a good extent by ethnobotanical and agrobiodiversity literature review. Nevertheless, identification of many plants without specimens and the help of a botanist could not be made.

6. Comments and recommendations for future research process

- In the future, direct cross-checking of locally categorized foods into standard food groups should be done by the enumerators when still in the field. Therefore, better training of enumerators on local categories and standard food groups would improve data quality.

- Enumerators should also more strongly probe whether the community is listing local food plants that exist in the village (after the cross-checking, it was found that some of the listed crops may not exist in the village, and on the contrary, some plants were forgotten).
- For the language issue (and to prevent common misspelling of plant names), the enumerators should be from the study area, or if not, they should have a local assistant.
- FGD records and notes should be explored during the data analysis.
- There should be enough time for proper training of data enumerators, and then a reliable communication and supervision of the field team should be ensured (at least during the beginning of the fieldwork).
- For future cross-study comparisons, the diversity should also be assessed at the species level (without varieties). Nevertheless, for that, further cross-checking of vernacular names and also the botanical identification of lesser-known food plants need to be initiated by NESFAS
- It would be also interesting to explore the data and compare the diversity from a land-use point of view

7. Key suggestions for the project implementation

- Categorizing and ranking all plants from 32 villages was finalized and matched with the dietary diversity data. Now the participatory feedback and reality check on prioritized species should be conducted and the final crop list prioritized with the communities.
- The creation of ABD database and ABD catalogue will be useful outputs helping NESFAS staff and stakeholders to orient within the extraordinary agrobiodiversity of North-East India. These outputs should continuously evolve with upcoming new information.
- Keep photo-documenting plants and cross-checking plant names across the areas and ethnic groups (same plant species can have different names according to region, ethnic group, dialect).
- The crop seasonal calendar data can be turned into a community tool for improving diet and awareness, and for other activities such as farmer markets, events and so on.
- Feel free to fully explore the data and use it for further project activities and future research

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