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Ministry of Agriculture and Livestock
Building Resilient Commercial Smallholder Project
Pelrithang: Sarpang



QUALITATIVE BEHAVIOUR RESEARCH REPORT

BRECSA PROJECT



MARCH, 2025

Abbreviation

BHU	Basic Health Unit
BRECSA	Building Resilient Commercial Smallholder Agriculture
EBF	Exclusive breastfeeding
ECCDs	Early Child Care and Development
ECR	Extended Classroom
FGD	Focus Group Discussion
FOs	Field Officers
GAFSP	Global Agriculture and Food Security Programme
HWC	Human-wildlife Conflict
IFAD	International Fund for Agriculture Development
KII	Key Informant Interview
KAP	Knowledge, Attitude and Practice
NFE	Non-formal Education
NWFP	Non-Wood Forest Product
PA	Participatory Appraisal
WFP	World Food Programme
SJs	Sanam Jabchorpas
TA	Technical Assistance

Abstract

A qualitative behavioural study was conducted across 12 gewogs in Sarpang, Tsirang, Trongsa and Zhemgang districts under the BRECSA project to examine how food availability, accessibility, affordability and consumption patterns shape dietary behaviours among four groups of women (adolescent girls, youth, pregnant and lactating women, and women of reproductive age). Semi-structured key informant interviews (n=149) and focus group discussions (n=255) were facilitated by trained field officers (Fos) and Sanam Jabchorpas (SJs), with participants including local government representatives, extension officers, teachers and health workers.

Findings reveal that agro-ecological diversity and seasonal climate cycles create lean-season gaps in vegetable production, while monsoon-prone roads and long market distances inflate transport costs and limit off-season supply. Households rely heavily on staples (rice, maize) and a narrow basket of cash crops (cardamom, oranges) or handicrafts, resulting in low dietary diversity and infrequent intake of animal-source proteins. Despite basic nutrition awareness imparted through health centres, diets remain “rice–curry” centric, with fruits, meats and eggs consumed only monthly. Women shoulder dual roles in food production and caregiving, constraining exclusive breastfeeding and their own nutrition.

Key barriers include seasonal shortages, post-harvest losses, poor market access, high food prices, limited mechanization, and insufficient agriculture–nutrition extension. Recommendations call for integrated, climate-resilient interventions: rainwater harvesting and irrigation, rural road upgrades and mobile markets, distribution of fast-maturing vegetable varieties, community childcare cooperatives, women-focused micro-credit, participatory cooking demonstrations, and participatory monitoring to strengthen food security, dietary diversity and nutrition outcomes across the four districts.

Acknowledgement

The research team acknowledges the BRECSA Project Management Unit (PMU) for facilitating this research study through their strong collaboration and coordination with Dzongkhag and Gewog administrations. We are particularly grateful to the elected local government officials- Gewog Thrizins, Mangmis, and Tshogpas whose active engagement in the focus group discussions (FGDs) provided critical insights into community dynamics.

Our thanks also go to the civil service staff which include agriculture and livestock extension officers, teachers, health assistants (HAs), community centre managers, and ECCD facilitators whose expertise elucidated local food availability, accessibility, affordability, and consumption patterns.

We are indebted to the international and national nutrition experts from WFP whose guidance shaped our research methodology, refined key questions, and supported our field demonstrations and data-collection processes.

Finally, we acknowledge the Senior FOs of Tarayana Foundation (TF) and the dedicated SJs, whose leadership and commitment were instrumental to the successful completion of this qualitative behaviour study.

Glossary

Bashika	An NWFP commonly known as malabar nut the flower of which is consumed as vegetable
Chewog	Sub-block
Dengo	Dengo is dough prepared out of any cereal flour. The preparation consists of boiling the water and adding flour to the boiling and cooking followed by thorough kneading
Dumroo	Latin name <i>Elatostema lineolatum</i> the fleshy leaves and stems of which consumed as vegetables
Dzongkhag	District
Gewog	Block (Sub district)
Gewog Thrizin	Chairperson of the block level development board
Khuli	Khuli is a pancake usually prepared from buckwheat flour
Kepta	Kepta is a flat bread normally prepared from wheat flour which roasted over a heated pan
Sanam Jabchorpas	Agriculture extension supporters
<i>tseri</i>	Agriculture farming practice involving slash-and-burn
Wangpemo	An NWFP known as nakima the flower of which is consumed as vegetable

Executive summary

This qualitative behavioural research explores the underlying social, cultural, and economic factors that shape household food-related behaviours, particularly among adolescent girls, pregnant, and breastfeeding women. It examines community-level knowledge, attitudes, and practices across key themes: food availability, accessibility, affordability, consumption patterns, and nutrition awareness. The study provides critical insights into behavioural drivers and systemic challenges affecting nutrition outcomes in vulnerable gewogs, with strategic recommendations for responsive interventions.

Food Availability

Communities cultivate a diverse range of crops, including rice, maize, millet, vegetables, and fruits, complemented by livestock products such as dairy, poultry, and pigs. Non-wood forest products like fiddle head ferns, bamboo shoots, mushrooms, and dumroo are also accessed. Despite this diversity, seasonal shortages; particularly in winter and climate-related disruptions like heavy rainfall, heat, and water scarcity significantly hinder consistent food availability. Staple cereals, especially rice, face chronic shortages in some gewogs, while vegetable shortages are widespread. Post-harvest losses, wildlife conflicts, traditional farming constraints, and limited access to resources further restrict productivity and contribute to food shortages. Seasonal malnutrition risks persist due to reliance on staples and limited dietary diversity.

Food Accessibility

Physical access to food is generally feasible within a 30-minute walk in most communities; however, poor road conditions and monsoon-related blockages during rainy seasons impair transportation. High transportation costs elevate food prices, reducing affordability for nutrient-rich foods such as fruits, vegetables, and animal proteins. Cultural and religious factors influence dietary choices, and reliance on energy-dense staples leads to less nutritious diets. Vulnerable groups, including women, the elderly, and low-income households, face heightened malnutrition risks due to these barriers.

Food Affordability

Households allocate approximately 70-80% of their income to food, leaving limited capacity for purchasing diverse and nutritious options. Rising food prices, driven by transportation expenses and limited local production, force communities to depend on cheaper, calorie-dense foods, often at the expense of micronutrient-rich foods. While government initiatives like greenhouse projects and women's farming groups exist, affordability remains a challenge for the most vulnerable.

Consumption Patterns

Dietary habits predominantly involve rice or maize with vegetable curries, with minimal intake of proteins and fruits. Most of the participant to the FGDs purchased meat, eggs and cheese

monthly indicating that the participants get some animal proteins and vitamins in their diets. Younger generations increasingly prefer processed junk foods, leading to erosion of traditional dietary knowledge and habits and reduced dietary diversity and micronutrient deficiencies. Seasonal reductions in vegetable consumption during winter further exacerbate nutritional gaps. These patterns are likely to contribute to rising non-communicable diseases such as diabetes and hypertension.

Nutrition Awareness and Challenges

Maternal nutrition awareness has improved through health centers; however, broader community education on balanced diets and local food benefits is needed. Key challenges include seasonal food shortages, post-harvest losses, limited market access, high food costs, low nutrition awareness, and declining dietary diversity.

Recommendations

Long-term strategies

- Strengthen agricultural resilience via reliable irrigation, improved storage, and crop diversification.
- Develop infrastructure to enhance road connectivity and market access.
- Support income diversification and targeted subsidies to boost economic resilience.
- Promote local, nutrient-rich foods through expanded nutrition education.

Medium and short-term actions

- Facilitate the marketing of surplus produce between gewogs based on seasonal production calendars.
- Implement sharing mechanisms among women's groups to grow and exchange diverse vegetables and fruits.
- Identify high-nutrition crops suitable for various locations to establish nutrition gardens.
- Link producers with markets and grocery shops to sell excess produce, improving income and access.
- Utilize strategic planning tools to optimize production and mitigate seasonal shortages.

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1. Introduction

The project-Building Resilient Commercial Smallholder Agriculture (BRECSA) under the Ministry of Agriculture and Livestock (MOAL) is financed through a GAFSP grant of a USD 13 million with IFAD co-financing with USD 8.935 million as a fully blended project. IFAD is the Supervising Entity for Investment and the Lead Implementing Partner Agency, while WFP is the Supervising Entity for Technical Assistance and Implementation Support. The project is implemented in the 4 target dzongkhags of Sarpang, Trongsa, Tsirang and Zhemgang with the goal to catalyse a 30% increase in resilient commercial agricultural production and improve food and nutrition security by 2030. The development objective is to transform smallholder agriculture into inclusive and resilient agri-food systems that are increasingly profitable and food and nutrition secure. BRECSA targets subsistence, semi-commercial and commercial farmer households.

To support the Sub-component 1.3: Support to vulnerable groups to improve income and nutrition status of the project it is foreseen that a TA administered by WFP and contracted to Tarayana Foundation led this study with the technical support from WFP carried out qualitative behaviour research to examine dietary diversity and explore the dynamics of food availability, accessibility, affordability, and consumption among four groups of women within BRECSA target districts : adolescent girls (15-17), youth (18-35), pregnant and lactating women, and other women in the reproductive age group (36 to 49). The findings of this study will form a solid knowledge base to develop a detailed Social Behaviour Change (SBC) plan for BRECSA beneficiaries.

2. Objectives

To explore the perceptions, experiences, and behaviours of adolescent girls, pregnant and breastfeeding and other women regarding food availability, accessibility, affordability, and consumption patterns, and how these factors influence their dietary choices in BRECSA target districts.

3. Methodology

Participatory appraisal

What is Participatory Appraisal?¹

Participatory Appraisal (PA) is a **community-based** approach to research and consultation that gives priority to the views of local people, on the basis that **they are the experts** in their own lives and are thus best placed to come up with a programme of collective actions. PA provides a wide range of flexible, adaptable tools and techniques, designed to provide methods of consultation that can be chosen and reworked to suit whichever group is taking part in the

¹ North East Social Enterprise Partnership 2014. Introduction to the Principles of Participatory Appraisal.

process. It equips local people with the skills and confidence to work as equal partners with agencies, service providers and other stakeholders. It breaks down barriers between community representatives and civil servants and promotes shared understanding of each other's priorities and constraints.

“The strength of rapid participatory appraisal is that it can be carried out with limited resources and furnish clinicians and planners with rich insights into local communities; for those in resource poor settings it is therefore a worthwhile first step to assess baseline health and social measurements. Moreover, as an action research method it facilitated changes even before the Health Forum started to meet; this ability to create capacity from within the community is one of its greatest strengths. By promoting intersectoral communication and co-operation using an approach from within the traditional medical model, Rapid Participatory Appraisal can help community planners focus on development outcomes rather than simply assess need.

Participatory Appraisal is found to have benefits in increasing community engagement, fostering human development and community action, promoting joint local government and health service co-operation, and enabling locally driven service development through identifying ways to provide better service delivery. It would therefore seem timely to promote, utilise and further develop rapid appraisal methods.”²

Since the nutrition intervention is a behaviour change process, participatory appraisal is suited to find out the KAPs of the community members who will be leading the behaviour change processes during and after the intervention. This methodology allowed the community members assess their own KAP on the nutrition. In the process those community members who have the knowledge could share it with those who do not have. This already starts the process of improving the KAP even before the implementation of the interventions. However, for the purpose of this assessment, the appraisal focused topical the issues on food availability, accessibility, affordability and consumption patterns related to the nutrition.

This built the confidence (equip local people with the skills and confidence to work as equal partners) of the community members to engage in the interventions during the implementation.

To be able to effectively use this methodology a group of Tarayana Field Officers (FOs) and Sanam Jabchorpas (SJs) were trained on the tools and techniques used in the participatory appraisals. Then the FOs were given demonstration on how to conduct key informant interviews (KIIs) and focus group discussions at Tareythang gewog in Sarpang. After the demonstrations, observations and experiences were shared among the FOs and some of the SJs of the Tareythang and nearby gewogs.

² Colin S Brown, Simon Lloyd and Scot A Murray 2006. Using consecutive Rapid Participatory Appraisal studies to assess, facilitate and evaluate health and social change in community settings

Methods

Key informants

The following key informants were in the gewog administrations were interviewed prior to the FGDs.

- Mangmis
- Tshogpas
- Gewog Admin Officers
- Health Assistants
- Teachers
- Agriculture Extension Officers
- Lead Farmers
- Community Centre (CC) Manager

Table 1: Total numbers of Key Informants

Gewog	No. of KIIs
Jigmechhoeling	10
Chhudzom	21
Tareythang	16
Patshaling	11
Sergithang	7
Tsirangtoed	17
Nubee	27
Korphu	4
Langthil	10
Bjoka	10
Shingkhar	5
Trong	11
Total	149

Checklist for discussions with Key Informants Interviews is annexed.

Focused group discussions

The focused groups members include pregnant and breastfeeding women, adolescent girls (15-17 years), young women (18-35 years), and women of reproductive age (36-49 years).

Table 2: Total number of FGD

Gewog	No of FGD participants
Jigmechhoeling	22
Chhudzom	26
Tareythang	19
Patshaling	21
Sergithang	21
Tsirangtoed	17
Nubee	44
Korphu	12
Langthil	19
Bjoka	16
Shingkar	18
Trong	20
Total	255

The same set of semi-structure questionnaire as in KII was used for the FGDs with charts as additional tool for greater engagement of the participants. While using the charts not all the FGDs members participated in all the issues all the time that were discussed since their household conditions were not same.

4. Key Findings

4.2 Summary of Thematic findings

1. Food Availability

A wide variety of crops (rice, maize, millet, vegetables, fruits) and livestock products are available, but seasonal shortages (especially in winter) and climate-related challenges (heavy rainfall, heat, water scarcity) reduce consistent availability. Most households grow food for self-consumption, with limited surplus for sale.

The following table shows the varieties of food sources across the study gewogs.

Table 3: varieties of food sources across the study gewogs.

Sl.No	Gewogs	Crop Varieties	Livestock	NWFP
1	Chudhzom	18	Dairy,poultry,fish,goat,	Yes
2	Jigmecholing	15	Dairy,poultry,fish,goat,piggery	Yes
3	Tareythang	15	Dairy	No
4	Korphu	18	Dairy,piggery,poultry	Yes
5	Langthel	28	Dairy,piggery,poultry	Yes
6	Nubee	8	Dairy,piggery,poultry	Yes
7	Patshaling	13	Piggery and poultry	Yes
8	Sergithang	14	Piggery and poultry	Yes
9	Tsirangtodd	13	Dairy and poultry	No
10	Bjoka	14	Dairy and poultry	Yes
11	Shingkhar	14	Dairy,piggery,poultry	Yes
12	Trong	17	Dairy,piggery,poultry,fish,goat	Yes

The above table show the varieties of food sources that are available within the communities. Crop varieties that are grown in the communities range from low of 8 in Nubee gewog to 28 in Langthel gewog. The communities maintain livestock as seen in the above table: dairy being common across the gewogs and many gewogs with poultry and piggery. Similarly, most of the gewogs access non-wood forest products (NWFPs). Most commonly used NWFPs are fiddle head ferns, bamboo shoots, cane shoots, mushrooms and dumroo. Bashika (Malabar nut) and Wangpemo (nakima) are consumed in some gewogs.

While diverse food sources are available, food shortages are common due to seasonality of productions. The staple cereal rice shortages are common throughout the gewogs under this assessment. Langthel, Chudhzom and Tareythang gewogs are worst with chronic shortages throughout the year while Patshaling and Tsirangtoed are better which experience shortage only for one month in a year. Similarly maize shortages range from one month to nine months in a year. Vegetable shortages are common throughout the gewogs.

The only coping mechanism for shortages are purchases from the groceries in their locality which discussed under food affordability.

Wildlife conflicts and traditional farming methods further restrict productivity. Women play a significant role in food production but face constraints due to lack of resources (seeds, irrigation, veterinary services). Limited storage facilities and pest infestations contribute to food waste.

Seasonal malnutrition risks due to winter shortages. Limited dietary diversity as households relies on staples (rice, maize) rather than nutrient-rich foods (vegetables, fruits, dairy). Post-harvest losses reduce food security, forcing dependence on market purchases.

2. Food Accessibility

Poor road conditions, long distances to markets, and monsoon-related road blockages hinder access to fresh food. However, other times basic food items are easily accessible. High transportation costs inflate food prices, making nutritious foods (fruits, vegetables, animal proteins) less accessible. Many areas lack cold storage, forcing reliance on distant markets where prices fluctuate.

The physical accessibility is not seen as a challenge. While the KIIs indicated physical accessibility as a challenge due to poor road conditions and blockages during monsoons, the FGDs did not support the KIIs' views. Most of the participants to the FGDs could access basic food items within a walking distance of 30 minutes. However, exceptions were also observed where some of the participant needed to walk more than one hour. Some of the households of Nubee, Korphu, Bjoka and Shingkhar gewogs had to walk more than one hour to the nearest groceries

Some communities avoid certain meats due to religious or cultural beliefs, further limiting dietary diversity.

Reliance on energy-dense staples (rice, maize) over micronutrient-rich foods and increased junk food consumption due to convenience and limited fresh produce access influence dietary changes negatively. The vulnerable groups (women, elderly, low-income households) face higher malnutrition risks due to financial and physical barriers.

3. Food Affordability

Households spend 70-80% of income on food, leaving little room for diverse, nutritious options. Rising food prices, driven by transportation costs and low local production, force reliance on cheaper, less nutritious foods. Government interventions (greenhouses, women's farming groups) exist but not affordable by those who need most due to subsidy practices of the government.

The following table shows number of income sources.

Table 4: Income sources

S.No	Gewogs	Income sources (No.)
1	Chhudzom	4
2	Jigmechhoeling	7
3	Tareythang	4
4	Korphu	5
5	Langthel	6
6	Nubee	4
7	Patshaling	6
8	Sergithang	4
9	Tsirangtoed	7
10	Bjoka	4
11	Shingkhar	5
12	Trong	5

The number of income sources vary from 4 to 7 with distant gewogs at the lower range in the number of income sources.

The following chart shows the income sources and % of FGD participants who depend on these income sources.

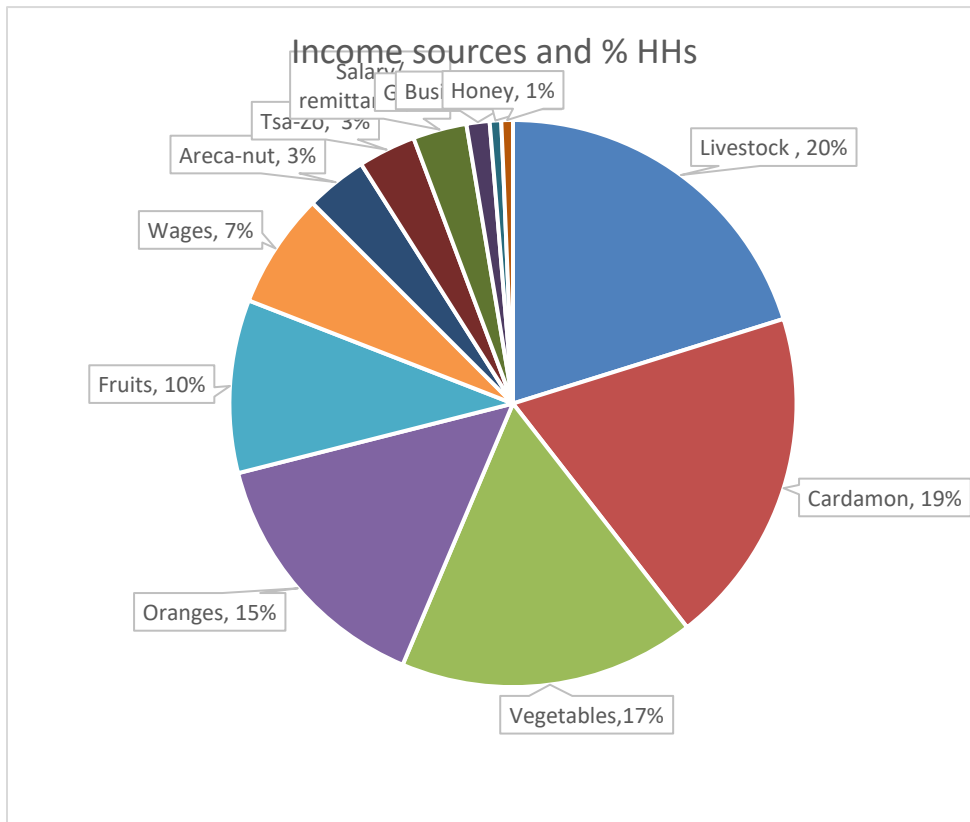


Chart 1: Income sources and % of Households

Majority of the FGD participants derive their income from livestock followed cardamom, vegetables, fruits and oranges.

The following chart shows the income ranges as discussed at the FGDs.

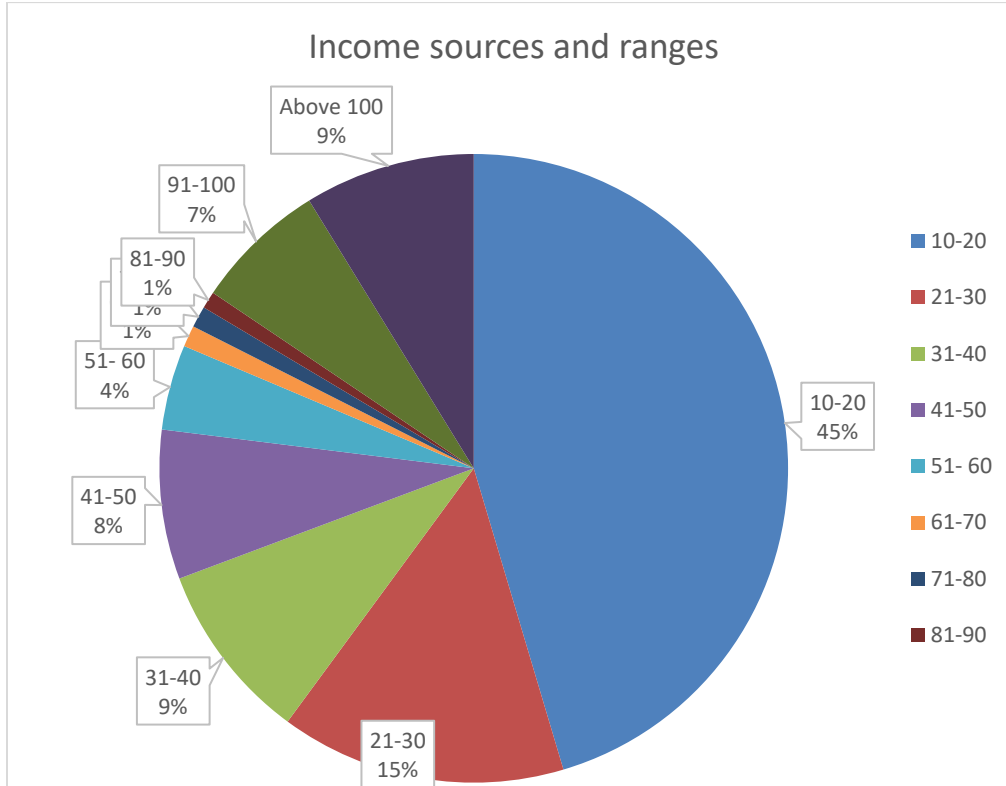


Chart 2: Income sources and ranges

The above chart shows the income of most of the participants to FGDs are in the range of Nu. 10000 to Nu. 20000. However, this should be treated as indicative and not as ground reality as in many findings conducted, the respondents always lower their incomes if not followed by further cross-checking tools. For this, further validation was not carried out.

Despite limited income, all the FGD participants made purchases of food items the main items being imported rice, cooking oil, salt, sugar and tea leaf. They also purchased meat, butter and cheese monthly. While there are indications that they also purchased vegetables, it is difficult to know what types and varieties. However, it is expected that food items are purchased and hence affordable.

The consequences of high costs are prioritization of calorie-dense over nutrient-dense foods due to cost constraints, selling nutritious homegrown produce for cash, reducing household consumption and increased risk of diet-related diseases (diabetes, hypertension) due to poor-quality diets.

4. Consumption Patterns

Most meals consist of rice/maize with vegetable curry, with limited protein (meat, dairy) or fruit intake. Younger generations prefer junk food over traditional nutrient-rich foods. Reduced vegetable consumption in winter exacerbates micronutrient deficiencies. Many mothers struggle to maintain nutritious diets, affecting infant health.

The changes in consumption behaviour are leading to low dietary diversity leads to micronutrient deficiencies like iron, vitamin A, etc. Rising non-communicable diseases (NCDs) due to processed and junk food consumption. Intergenerational nutrition gaps on consumption behaviour are eroding traditional knowledge and practices.

5. Nutrition awareness and quality

While maternal nutrition awareness has improved through targeted interventions at health centres, broader education on balanced diets and the benefits of local foods remains essential. Integrating nutrition into agricultural programmes can deepen understanding of how food availability, accessibility, affordability, and consumption patterns shape dietary choices, empowering women to make more nutritious decisions at the household and community levels.

Conversely, hypertension and diabetes are linked to poor dietary habits and an overreliance on staple foods. The same underlying nutritional deficiencies and mothers' early return to work which also contribute to their difficulty with exclusive breastfeeding.

6. Key challenges

The key challenges for positive nutrition behaviour changes are seasonal food shortages, post-harvest losses, poor market access, high food prices, low nutrition awareness and declining dietary diversity.

7. Recommendations

Long term

- Enhance agricultural resilience through reliable irrigation systems, appropriate storage technologies and diversified crops.
- Invest in infrastructure development for better roads and markets improve access to food and markets.
- Support economic opportunities through targeted subsidies and income diversification.
- Enhance nutrition education by promoting local, nutrient-rich foods.

Medium and short term

- Link gewogs with different productions for marketing the vegetables from areas of abundance to areas of shortages. For example, the gewogs in the north producing and selling to the gewogs in the south during summer and vice versa.
- Use production calendars and food shortage calendars for strategic production and marketing planning.
- Explore sharing mechanisms (women's group – physical, social media) among the pregnant and breastfeeding women to grow and share varieties of vegetables and fruits.

- Identify key vegetables with production potentials for different locations and high nutrition content for nutrition gardens.
- Link the growers to existing grocery shops to sell the excess vegetables identifying quantity that can be produce and sold and prices for buyers and sellers.

Dzongkhag wise Findings

5. Sarpang Dzongkhag



Key Informant Interview by Field Officer



Topical FGD



FGD participants

5.1 Introduction

This report presents qualitative insights from a behavior-focused research study conducted across selected gewogs of Sarpang Dzongkhag, Bhutan. The study aimed to better understand community food systems, agricultural and livestock practices, and the socio-environmental factors influencing food and nutrition security at the grassroots level.

Sarpang Dzongkhag, with its diverse geography and socio-economic conditions, comprises several rural gewogs where livelihoods predominantly depend on agriculture and livestock rearing. The gewog-wise findings offer an in-depth understanding of local contexts, challenges, and opportunities related to food production, access, and consumption patterns.

By combining field observations with community engagement, the research highlights both commonalities and distinct characteristics across different gewogs. The sections that follow present district-specific narratives, beginning with Chhudzom, Jigmechhoeling, and Tareythang gewogs. These findings aim to inform future planning and implementation of nutrition-sensitive agriculture interventions and resilience-building strategies in the region.

5.2 Findings: Chuddzom Gewog

A. Food Availability

The KIIs and FGDs agreed that agriculture and livestock products were widely available in the communities. These included various vegetables (chili, beans, dhal, green leafy vegetables, cauliflower, pumpkin, radish, garlic, peas, tomatoes, etc.), cereals (maize, rice, mustard, wheat, millet, buckwheat, etc.), fruits (orange, banana, mango, pears, avocado, sugarcane, peach, ground apple, etc.), cardamom and livestock products (dairy products, chicken, pig, goat, fish).

Non-wood forest products (NWFPs) such as bamboo shoots, mushrooms, wild potatoes, ferns, cane shoot, wild avocado, Wangpema (nakima), yam, bashikha (Malabar nut), paper, dumroo (*Elatostema lineolatum*), Indian madder (*rubia*).

However, vegetable cultivation faced challenges due to pests, diseases, declining soil fertility, invasive plants, heavy rainfall, and extreme heat, leading to seasonal variations. Additionally, water shortages in winter affected agricultural activities, particularly in Sumkhara village.

Own Food Production

The focus group discussion listed the varieties crops grown in the gewog as in the following table.

Table 5: Food Availability Calendar-Chuddzom

SL. No	Crops grown	Bhutanese Months											
		1	2	3	4	5	6	7	8	9	10	11	12
1	Broccoli												
2	Sag												
3	Cabbage												
4	Cauliflower												
5	Chilli												
6	Potato												
7	Ginger												
8	Tomato												
9	Maize												
10	Rice												
11	Carrot												
12	Radish												
13	Egg-plant												
14	Peas												
15	Beans												
16	Cardomam												
17	Orange												
18	Avocado												

	Planting
	Harvesting

The table above shows a wide range of crops are grown and can be grown in the gewog as per the participants of the FGD. The varieties of crops grown has the potentials to fulfil the dietary requirements of the population. However, the seasonal availability will limit the year-round dietary diversity.

Food shortages

The following table shows the food shortages that the FGD participants experienced as discussed during the FGD.

Table 6: Food shortages Calendar - Chuddzom

SL. No	Food items	Bhutanese months												Remarks	
		1	2	3	4	5	6	7	8	9	10	11	12		
1	Rice														
2	Maize														
3	Wheat														
4	Buckwheat														
5	Millet														
6	Vegetables														

Though as many as 18 varieties of crops are grown, they are not available throughout the year as can be seen from the above table. Food shortages are common during the lean seasons. The following table shows the months when food items are short. While all households do not face food shortages the year round, it is common among the vulnerable groups like women headed households and elderly population. That is why rice is shown short the year round.

B. Food Accessibility

The lack of cold storage facilities prevents them from storing surplus produce. During the agricultural off-season, the community purchased food from the Gelephu and Indian market of Dadgari and occasionally from local markets.

Monsoon seasons frequently led to road blockages, affecting market access. Prices of goods also increased during the monsoon period. Additionally, commodity prices rose whenever there was a salary increment for civil servants.

Purchase frequencies

The following table shows the food items and purchase frequencies as pointed out during the FGD.

Table 7: Food Purchase Frequency - Chuddzom

SL.No	Food items	Food and purchase frequencies					
		Daily	Weekly	Monthly	Every 3 months	Every 6 months	Once a year
1	Rice			26			
2	Oil			26	1		
3	Salt		3	11	7	5	
4	Sugar		3	23			
5	Milk-powder		8	18			
6	Tea-leaf			11	15		
7	Vegetables			7			
8	Meat			26			
9	Fruits			26			
10	Egg		17	9			

The main purchases are mainly imported food items and most of the households make purchases on monthly basis for essential items.

Distances to food source

The following table shows the distances that the FGD participants travel to buy their basic food items in terms of walking distances and travel by cars.

Table 8: Distance to Food Source - Chuddzom

SL.No	Sources for purchase (shop)	Distance to food source						
		Walking distances (minutes)				Distance by car (minutes)		
		15	30	60	60+	15	30	60
1	Rice	8	11			7		
2	Vegetables	26	0					
3	Meat		12		12			
4	Groceries	8	11			6		

While the KII expressed challenges to purchase food items due to poor road conditions, long distances and lack of storage facilities, the FGD revealed that the food items are easily available through chiwog and village level grocery shops. Most of the households can reach the shops within 30 minutes on foot. Most of the vegetables are available within 15 minutes' walk. The following table shows the distances and number of households to the nearest shops.

C. Food Affordability

The cost of food has risen significantly compared to previous years. Farmers allocate approximately 70% of their income to food expenses, leaving minimal funds for other necessities. There is also a shift in consumption patterns due to youth involvement in village life. While 50% of the population maintains traditional diets, the other 50% has diversified their food intake.

Awareness of balanced diets is increasing, driven by economic, cultural, health, and educational factors. No major issues exist regarding

The main sources of income included selling cardamom, citrus fruits, vegetables, dairy products, and labor. Due to fluctuations in product availability and market prices, households spent approximately 70% of their income on food throughout the year.

Sources of income

The following table shows the sources of and income for the households present during the FGDs. The most common sources of income are cardamom and vegetables followed by fruits and livestock products. The labour wage did not appear during the FGD which was mentioned at KIIs.

Table 9: Food Sources and Income Range – Chuddzom

SL.No	Income sources	Income range(Nu.000)									Total HHs	
		10-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100		Above 100
1	Cardamom	1		2	1	7				5	10	26
2	Vegetables	13	9	4								26
3	Fruits	9	5		1					6	4	25
4	Livestock	18										18

The table indicates that most of the households earned on average Nu. 60,000/= considering that average income from each source as Nu. 15000 (average of Nu.10,000 and Nu. 20,000). Therefore, it is safe to assume that at least the FGDs participants have sufficient income to purchase food.

D. Consumption Patterns

Compared to the past, the community now consumes a more diverse range of foods based on seasonal agricultural production. Rice remains the staple food, with occasional consumption of roti (pancake). However, some households faced difficulties in accessing fresh vegetables from markets.

Religious practices also influenced dietary habits. Around 20% of the community, particularly Hindus and Christians, observed fasting twice a month, during which they consumed fruits and dairy products.

While food consumption patterns have improved, there is still a need for more nutrition education, particularly on balanced diets, food processing, and cooking techniques.

Consumption frequency

The following shows the types of food and frequency of consumption which consist of daily cereals – mainly rice – and vegetables.

Table 10: Frequency of Food Consumption-Chuddzom

Sl. No.	Food items	Consumption frequency			Remarks
		Daily	Once in a week	Once a month	
1	Cereals	26			
2	Vegetables	26			
3	Fruits				Seasonal

The food types in the above table show only cereals and vegetables. However, the food items purchased show that the households consume more than that are listed above. The purchase list show that meat, fruits and eggs are purchased monthly that indicate that these food items consumed at least once a month.

Preparation methods

The preparation methods have influence on the quality of nutrients in the vegetables. The following table shows the various methods of food preparations. However, the preparation methods are predominantly boiling for both the cereals (mainly rice) and vegetables. Fruits are consumed raw which is normal.

Table 11: Preparation Methods -Chuddzom

S. No.	Food items	Boil	Steam	Fry	Roast	Raw	Remarks
1	Cereals	26					
2	Vegetables	26	18	22	4	8	
3	Fruits					26	Seasonal

E. Nutrition quality, awareness and Breastfeeding

During the FGDs, participants emphasized the importance of proper nutrition during breastfeeding, particularly the practice of exclusive breastfeeding (EBF) for six months. However, many mothers faced challenges in maintaining a proper diet, leading to low milk production and discontinuation of EBF.

Some mothers identified specific foods that could enhance milk production, including mashed bananas, vegetable soups, and porridge. A few also mentioned that consuming a balanced diet could improve milk supply. However, most mothers had to resume work soon after childbirth, leaving their infants in the care of others, making it difficult to continue exclusive breastfeeding.

The strength of the FGDs was the inclusion of a diverse group of women from various cultural backgrounds and both rural and urban areas, providing valuable insights into nutrition-related challenges in the community.

Challenges and Support Required

Insufficient water supply affects home gardening. Farmers require additional water storage solutions, including reserve tanks and piping systems.

Farmers need access to hybrid seeds and greenhouse facilities to increase resilience to climatic variations and improve crop yields.

Farmers require power tillers, labor cost support, and mechanized solutions to enhance agricultural productivity. A formal request for technological assistance was made in Shompangkha between LG and BRECSA but has not yet received feedback.

Some farmland contains excessive stones, making cultivation difficult. Farmers require dozers (backhoe) to prepare land for kitchen gardens.

Some communities have limited land, erratic rainfall, human-wildlife conflict (HWC), and landslides near agricultural farms. Seasonal variations affect cultivation, and there is a shortage of irrigation and drinking water. Additionally, soil nutrition is declining, along with native

seeds, livestock, and non-wood forest products (NWFP). Low production, invasive weeds, challenges in composting, and high transportation costs further add to the difficulties.

5.3 Findings: Jigmechhoeling Gewog

A. Food Availability

Based on KIIs and FGDs discussions, agriculture and livestock products were widely available in the communities. These included various vegetables (Chili, beans, dhal, green leafy vegetables, cauliflower, pumpkin, radish, garlic, peas, tomatoes, etc.), cereals (maize, rice, mustard, wheat, millet, buckwheat etc.), fruits (Orange, banana, mango, pears, avocado, sugarcane, banana, peach, ground apple), and livestock products (dairy products, chicken, pig, goat, fish). and cash crops like cardamom and livestock (Native pigs, cow, chicken, goats) were also available. However, due to pest and diseases, decreasing soil fertility, invasive plants, heavy rainfall and heat, cultivating vegetables was challenging, leading to seasonal variations. Additionally, water shortages in winter affected agricultural activities at Samkhara village.

Non-wood forest products (NWFPs) such as bamboo shoots, mushrooms, wild potatoes, ferns, cane shoot, wild avocado, Wangpema (nakima), yam, bashikha (Malabar nut), paper, dumroo (*Elatostema lineolatum*), Indian madder (rubia).

During the agricultural off-season, the community purchased food from the Gelephu market and sometimes from local markets. However, the lack of cold storage facilities prevented them from storing surplus produce. Moreover, monsoon seasons frequently led to road blockages, affecting access to markets. Prices of goods also increased during the monsoon period. There is an increase in price for the commodities when there was salary increment for the civil servants.

Own production

The focus group discussion listed the crops in the following table.

Table 12: Food Availability Calendar -Jigmechholing

Sl.no	Crop Grown	Bhutanese Months												
		1	2	3	4	5	6	7	8	9	10	11	12	
1	Rice													
2	Maize													
3	Sag													
4	Chilli													
5	Cabbages													
6	Beans													
7	Brocali													
8	Pumpkim													
9	Ginger													
10	Garlic													
11	Dal													
12	Cucumber													
13	Potato													
14	Orange													
15	Cardamon													

	Planting
	Harvesting

The gewog grows rich varieties of crops with staple crop rice, maize and varieties of vegetables and cash crops. The above table also shows the seasonal production and therefore the availability.

Food shortages

The following table shows the food shortage months as per the participants to the FGD of the Jijmechhoeling gewog.

Table 13: Food Shortages -Jigmechholing

Sl. No.	Food Items	Bhutanese Months												Remarks
		1	2	3	4	5	6	7	8	9	10	11	12	
1	Rice													
2	Maize													
3	Sag													
4	Chilli													
5	Potato													
6	Beans													
7	Cardamom													
8	Oranges													

Compared to other gewogs, the food shortages in Jigmechhoeling gewog are less severe with only three months shortage in the staple food – rice.

B. Food Accessibility

Breastfeeding women struggled to maintain a diverse diet during the monsoon season. Those with limited income and land managed by cultivating small home gardens, preserving and drying vegetables for year-round consumption. Women-headed households, in particular, faced financial challenges in ensuring dietary diversity.

Purchase frequencies

The FGD showed that most of the households purchase their essential food items which are mainly imported. The following table shows food items purchased and the frequency of purchases.

Table 14: Food Purchase Frequency -Jigmechholing

Sl.No	Food items	Daily	Weekly	Monthly	Every 3 months	Every 6 month	Once a year
1	Rice			11		3	
2	Oil			24			
3	Salt			24			
4	Milk-Powder		2	6	2		
5	Tea-leave			21	3		
6	Sugar		3	21			
7	Cheese			6	3		
8	Egg			15		1	
9	Meats		4	12			
10	Vegetables			21			
11	Butter			2			

Distances to food source

The following shows the households and distances to the place of food purchases.

Table 15: Distance to Food source-Jigemchholing

Sl. No	Sources for purchase (shops)	Distance by walking (minutes)				Distance by car (minutes)		
		15	30	60	60+	15	30	60
1	Rice	4	4				5	
2	Oil	17	7		1		1	
3	Sugar	17	7		1		1	
4	Salt	17	7		1		1	
5	Meats	7	2		1		1	
6	Cheese	9	2		1		1	
7	Vegetables	6	3		1		1	

The above table shows that food items are easily accessible with physical distance of 30 minutes' walk for majority of the households.

c. Food Affordability

The main sources of income included selling cardamom, chili, ginger, dairy products, and labour. Food prices have increased in the market, and households spend approximately 70% of their income on food. When they had enough money, they consumed a variety of foods daily. However, women-headed households faced financial challenges in ensuring diverse diets.

Sources of income

The following table is the outcome of the FGD on income sources and income ranges from the various sources as per the discussions.

Table 16: Food Sources and Income Range-Jigmechholing

S. No.	Income sources	Income Ranges (Nu.000)									Total Hhs	
		10-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100		Above 100
2	Oranges	2	3		2	2	1		1	2		13
3	Cardamom	3	7		4							14
4	Honey	3										3
5	Vegetables	5	1									6
6	Poultry	2										2
7	Dairy product	11										11

For Jigmechhoeling gewog, the major sources of income are from cardamom, oranges and dairy products. Orange is the most important incomes in terms number of household engaged the amount of income as well derived.

D. Consumption Patterns

Compared to the past, the community now consumes a more diverse range of foods based on seasonal agricultural produce. Rice remains the staple food, with occasional consumption of roti. However, some households struggled to access fresh vegetables from markets. However, due to different religions (Hindu, Christians) 20% of community members used to do Fasting practices in a month two times, but they used to eat fruits, dairy product. While food consumption patterns have improved, there is still a need for more nutrition education, awareness on balanced diets, food processing, and cooking training.

Consumption frequency

The following table shows the types of food consumed and their frequencies which is similar to the other gewogs. Rice dominates the cereals which is staple food even of those households that do not cultivate paddy.

Table 17: Frequency of Food Consumption-Jigmechholing

Sl. No	Food items	Consumption frequency			Remarks
		Daily	Once in a week	once a month	
1	Cereals	22			
2	Vegetables	22			
3	Fruits	4			Seasonal

The above table does not appear to represent the actual consumption. The own production and the purchases made indicate more diverse food being consumed like meat, cheese and eggs are consumption at least once a month.

Preparation methods

The following table show the food items and their preparation methods.

Table 18: Preparation Methods -Jigmechholing

S. No.	Food items	Boil	Stream	Fry	Roast	Raw	Remarks
1	Cereals	22					
2	Vegetables	22		17			
3	Fruits					16	Seasonal

The above table illustrates typical Bhutanese preparation methods – boiling - followed by rural households. However, vegetables are sometimes fried.

E. Nutrition Quality, Awareness and Breastfeeding

Focus group discussions revealed that participants recognized the significant role of proper nutrition during breastfeeding, highlighting the practice of exclusive breastfeeding (EBF) for the first six months as particularly important. However, many mothers face obstacles in maintaining a nutritious diet, which results in low milk production and the premature discontinuation of EBF. Participants identified specific foods that could enhance milk production, including mashed bananas, vegetable soups, and porridge. Furthermore, they acknowledged that consuming a balanced diet can have a positive impact on milk supply.

The majority of mothers who participated in the discussions were involved in farming and small-scale businesses. This responsibility often necessitated an early return to work after childbirth, resulting in infants being cared for by others, which complicates the ability to continue EBF. One participant, a new settlement woman, shared her experiences with land division and agricultural challenges. New Settlement Woman: “My parents have seven children. When we divided the land, I received more paddy fields but only 25 decimals of land. It is difficult to grow vegetables in the sloped area, so I used to lease land from neighbours for mass vegetable cultivation. However, due to pests and diseases, I sometimes harvested very little, making it difficult to provide nutritious food for my child”.

The FGDs benefitted from the inclusion of a diverse group of women from various cultural backgrounds and both rural and urban areas. This demographic representation provided valuable insights into the community's nutrition-related challenges.

Analysis of the FGDs and key informant interviews (KIIs) suggests that the community possesses a reasonable knowledge of Nutrition-Sensitive Agriculture Interventions; however, misconceptions regarding home gardening practices persist. Several barriers prevent pregnant and breastfeeding women, adolescent girls, young women, and women of reproductive age from successfully adopting these nutrition practices. Identified challenges include poor maternal nutrition, worries about a crying baby, anxiety over insufficient breast milk, early resumption of work, and familial pressure.

To effectively tackle these challenges, it is crucial to implement targeted nutrition education programs aimed at women, youth, and men to raise awareness and promote the benefits of home gardening. Furthermore, involving close relatives and Gewog administration in these interventions would help create a supportive environment conducive to adopting healthier nutritional practices.

Challenges and Support Required

Some communities have limited land, erratic rainfall, human-wildlife conflict, and landslides near agricultural farms. Seasonal variations affect cultivation, and there is a shortage of irrigation and drinking water. Additionally, soil nutrition is declining, along with native seeds, livestock, and NWFPs. Low production, invasive weeds, challenges in composting, and high transportation costs further add to the difficulties.

5.4 Findings: Tareythang Gewog

A. Food Availability

Based on KIIs and FGDs discussions, agriculture and livestock products were widely available in the communities. These included various vegetables (beans, green leafy vegetables, cauliflower, pumpkin, radish, etc.), cereals (maize, rice, mustard), fruits (banana, mango, orange, avocado, sugarcane, ground apple, groundnut), and livestock products (dairy products, chicken, pig, goat, fish). Non-wood forest products (NWFPs) such as bamboo shoots, mushrooms, wild potatoes, and cash crops like areca nut are also available. However, due to heavy rainfall and heat, cultivating vegetables are challenging, leading to seasonal variations. The heavy rainfall is perceived to decrease soil nutrients leading to low productions. Additionally, water shortages in winter affect both drinking and agricultural activities. Women play a significant role in vegetable and crop cultivation.

Own production

The following table summarises the varieties of crops that are grown in the gewog during FGD at Tareythang.

Table 19: Food Availability - Tareythang

SL.No	Crops grown	Bhutanese Months											
		1	2	3	4	5	6	7	8	9	10	11	12
1	Maize	Harvesting											
2	Butter/Cheese												
3	Millet				Harvesting				Planting				
4	Sag										Harvesting	Planting	
5	Beans	Harvesting			Planting								
6	Cabbage	Planting											Harvesting
7	Radish	Planting									Harvesting		
8	Chilli	Planting									Harvesting		
9	Egg-Plant	Harvesting		Planting	Planting	Planting							
10	Tomato	Planting	Planting	Planting						Harvesting			
11	Areca-nut		Harvesting	Planting									
12	Ginger	Harvesting											Planting
13	Garlic	Planting							Harvesting				
14	Banana	Planting											
15	Litchi	Harvesting				Planting							

	Planting
	Harvesting

Tareythang gewog grows very little cereals for consumption. Only cereal that the gewog grows - the maize - is used as animal feed. Only one chiwog cultivate paddy which was absent if the focus group discussion since there no women who were pregnant or breastfeeding. The crop production is hampered by torrential rains during summers and lack of water during the winters. The gewog also faces severe crop losses to wild animals and therefore demotivates the people to grow crops. Their main crop is arecanut – a cash crop and main source of income.

Food shortages

The following table shows the shortages of what little they produce.

Table 20: Food Shortage Calendar - Tareythang

SL.No	Food items	Bhutanese months												Remarks
		1	2	3	4	5	6	7	8	9	10	11	12	
1	Sag													
2	Chilli													
3	Butter/ Cheese													
4	Beans													
5	Tomatoes													
6	Onion													

Tareythang gewog grows very little food items on their own and therefore face shortages throughout the year for most of food items. The above table illustrates the shortages that the FGD participants expressed during the FGD.

Purchase frequencies

The FGD showed that most of the households purchase their essential food items which are mainly imported. The following table shows food items purchased and the frequency of purchases.

Table 21: Food Purchase Frequency - Tareythang

Sl.No	Food items	Daily	Weekly	Monthly	Every 3 months	Every 6 month	Once a year
1	Rice			11		3	
2	Oil			24			
3	Salt			24			
4	Milk-Powder		2	6	2		
5	Tea-leave			21	3		
6	Sugar		3	21			
7	Cheese			6	3		
8	Egg			15		1	
9	Meats		4	12			
10	Vegetables			21			
11	Butter			2			

Distances to food source

The following shows the households and distances to the place of food purchases.

Table 22:Distance to Food Source -Tareythang

Sl. No	Sources for purchase (shops)	Distance by walking (minutes)				Distance by car (minutes)		
		15	30	60	60+	15	30	60
1	Rice	4	4				5	
2	Oil	17	7		1		1	
3	Sugar	17	7		1		1	
4	Salt	17	7		1		1	
5	Meats	7	2		1		1	
6	Cheese	9	2		1		1	
7	Vegetables	6	3		1		1	

The above table shows that food items are easily accessible with physical distance of 30 minutes' walk for majority of the households.

B. Food Accessibility

In the monsoon seasons frequent road blockages affect access to markets and the prices of goods increase during the monsoons. During the agricultural off-season, the community purchased food from the Gelephu and Indian market of Dadgari and sometimes from local markets. The lack of cold storage facilities prevents them from storing surplus produce

Purchase frequencies

The following table shows the items that are regularly purchased on weekly and monthly basis

Table 23:Food Sources and Income Range -Tareythang

SL.No	Food items	Daily	Weekly	Monthly	Every 3 months	Every 6 months	Once a year
1	Rice			14	2		
2	Salt			12			
3	Oil			10			
4	Sugar		3	10			
5	Tea-leaf		1	11			
6	Flour			11			
7	Butter/Cheese		1				
8	Egg			14			
9	Meat			12			
10	Vegetables		3	9			
11	Milk-powder		10	9			

Most of the households in the gewog make purchases monthly while few households buy on weekly basis

Distances to food source

Though the KII showed that the men and women travel to Gelephu and Dadgari in India for their shopping, the FGD shows that most of the food items purchase within the village and chiwogs from the grocery shops present within 30 minutes walking distance. The following table shows the items available and distances they have to walk to purchase the food items.

Table 24: Frequency of Food Consumption-Tareythang

SL. No	Sources for purchase (shop)	Walking distances				Distance by car(minutes)		
		15	30	60	60+	15	30	60
1	Rice	6	11			4		
2	Vegetables	7	8			2	2	
3	Salt	7	8			2		
4	Oil	7	8			3		
5	Egg	7	8			1		
6	Meat	3	12			4		

C. Food Affordability

The main sources of income include selling areca nut, chili, ginger, dairy products, and labour. Food prices have increased in the market, and households spent approximately 70% of their income on food. When they had enough money, they consumed a variety of foods daily. However, women-headed households faced financial challenges in ensuring diverse diets.

Sources of income

The following table shows the income sources and income ranges.

Table 25: Food Sources and Income range-Tareythang

SL.No	Income sources	Income range (Nu. in 000)										Total HHs
		10-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	Above 100	
1	Areca-nut			7	1					5	3	16
2	Vegetables	4										4
3	Wage				5	3						8
4	Butter and cheese		7									7

As seen, besides arecanut, the gewog has very limited income sources in addition very limited production as discusses under food availability.

D. Consumption Pattern

Compared to the past, the community now consumes a more diverse range of foods based on seasonal agricultural produce. Rice remains the staple food, with occasional consumption of roti. However, some households struggled to access fresh vegetables from markets. While food consumption patterns have improved, there is still a need for more nutrition education, awareness on balanced diets, food processing, and cooking training

Consumption frequency

The following table shows the food items and consumption frequencies like the two gewogs above. The cereals (mainly purchased rice) and vegetables are consumed daily.

Table 26: Frequency of Food Consumption-Tareythang

Sl. No.	Food items	Frequencies			Remarks
		Daily	Once a week	Once a month	
1	Cereals	19			
2	Vegetables	19			
3	Fruits				Seasonal

However, the food purchase list indicate that majority of the households consume meat, eggs and cheese at least once a month.

Preparation methods

The following table shows the preparation methods of food items which is similar to the gewogs, i.e. mainly boiling. However, some households steam and roast as well.

Table 27:Preparation Methods-Tareythang

S. No.	Food items	Boil	Steam	Fry	Roast	Raw	Remarks
1	Cereals	19					
2	Vegetables	19	6	10	4	8	
3	Fruits					15	seasonal

E. Nutrition Quality, Awareness and Breastfeeding

During the FGDs, participants emphasized the importance of proper nutrition during breastfeeding, particularly the practice of exclusive breastfeeding (EBF) for six months. However, many mothers faced challenges in maintaining a proper diet, leading to low milk production and discontinuation of EBF. Some mothers identified foods that could enhance milk production, including mashed bananas, vegetable soups, and porridge. A few mothers also mentioned that consuming a balanced diet could improve milk supply.

Most of the participants were engaged in farming and small-scale businesses. Most mothers had to resume work soon after childbirth, leaving their infants in the care of others. This situation made it difficult for them to continue breastfeeding exclusively.

A woman from a women-headed household shared:

“We live in the village, and we are supposed to go to the farm and fetch water in the winter season. It is necessary to start giving porridge because we leave our child in the care of someone at home. When we are away, what will the child eat?”

The strength of the FGDs was that they included a diverse group of women from various cultural backgrounds and both rural and urban areas, providing valuable insights into nutrition-related challenges in the community.

Challenges and Support Required

Heavy rainfall and heat challenge the cultivation of vegetables, leading to seasonal variations. Additionally, water shortages in winter affected both drinking and agricultural activities and it has seen the nutrient of farming soil is decrease and able to get low products. The monsoon seasons frequently lead to road blockages, affecting access to markets. Prices of goods also increased during the monsoon period. Wildlife damages of crops demotivate the crop production by the communities.

5.5 Thematic Analysis of Qualitative Behaviour Research in Sarpang District

This section synthesizes findings from KII and FGD across the gewogs in Sarpang Dzongkhag. Through inductive analysis of participant narratives, seven core themes emerged. These reflect both structural and behavioural factors influencing food availability, access, affordability, and nutrition practices. The table below summarises each theme, followed by illustrative findings from the field:

Table 28: Thematic Analysis in Sarpang District

Theme	Description	Illustrative Findings
1. Agricultural Practices & Productivity	Reliance on rainfed, small-scale cropping; mixed subsistence & cash crops	Rice, maize, millet staples; chilli, beans & citrus for income; Tseri farming persists; Pest, soil decline, water shortages
2. Water & Irrigation Constraints	Seasonal scarcity undermines both crop and livestock sectors	Winter water shortages limit vegetable production; Lack of storage/tanks leads to dry-season crop failures
3. Market Access & Livelihood Diversification	Remote location + poor roads → high transport costs & limited off-season sales	Monsoon blockages isolate communities; 70% income on food; incomes from cardamom, areca nut, dairy; village shops constrained
4. Nutrition Knowledge & Practices	Growing awareness of balanced diets, but gaps in behaviour and resources	EBF challenges due to early work return; mothers cite porridge, banana soups; 50% traditional, 50% diversify

5. Gender & Care Burdens	Women's dual role in farming and caregiving impedes optimal feeding practices	Women-headed households food-insecure; introductory porridge quote
6. Human-Wildlife Conflict (HWC) & Environmental Stressors	Crop loss to elephants, boars and landslides; forest regulations limit expansion	Wild boars destroy vegetables; elephants raid paddy; protected zone restrictions
7. Institutional Support & Technology Needs	Demand for mechanization, improved inputs and extension services	Requests for the inputs and services

5.6 Recommendations Based on Thematic Insights

To enhance food and nutrition security in Sarpang, the study recommends the following:

The following strategic and practical recommendations are derived from the behavioural and structural themes identified above:

1. Strengthen Water Management

- Install community reservoirs and gravity-fed pipelines for dry-season irrigation
- Promote household and communal rainwater harvesting systems

2. Enhance Market Linkages

- Develop seasonal aggregation centres with cold-chain support
- Facilitate mobile markets during monsoon seasons for remote communities

3. Support Nutrition-Sensitive Agriculture

- Distribute fast-maturing, pest- and climate-resilient vegetable varieties
- Train farmers in composting, mulching, and integrated pest management

4. Empower Women and Caregivers

- Establish cooperative childcare groups or village creches to support exclusive breastfeeding
- Offer women-focused microcredit and flexible training schedules

5. Mitigate Human-Wildlife Conflict

- Install community-managed electric or solar-powered fencing
- Coordinate with forest and wildlife authorities on early-warning systems

6. Build Institutional Capacity

- Accelerate procurement and delivery of requested farm machinery (e.g., power tillers)
- Increase frequency of field days and on-farm demonstrations by extension agents

7. Promote Nutrition Education and Behaviour Change

- Conduct participatory cooking demonstrations with a focus on nutrient retention
- Develop culturally relevant BCC (Behaviour Change Communication) materials in local dialects

6. Tsirang Dzongkhag



Key Informant Interview at Tsirangtoed



FGD at Tsirangtoed



FGD participants in Tsirangtoed gewog

6.1 Introduction

The following section presents a brief overview of these three gewogs: Patshaling, Sergithang, and Tsirangtoed, where qualitative behavioural research was conducted. The overview includes geographical, agricultural, and socio-economic contexts that influence food production, consumption, and nutrition practices in the communities.

Patshaling: Patshaling Gewog, spanning an area of 170.9 square kilometers and ranging in elevation from 600 to 1900 meters above sea level, consists of five chiwogs: Chhuzomsa, Patshalingtoed, Patshalingmaed, Thakorling, and Pangthang. The Gewog's agricultural landscape is dominated by dry land farming in the upper regions, yielding crops such as maize, wheat, and mustard, while the lower elevations support wetland farming primarily for paddy and wheat. Cardamom and various vegetables serve as the principal cash crops, contributing to local livelihoods. Livestock ownership is prevalent, with almost every household engaged in rearing cattle, poultry, and beekeeping, further supplementing their food sources and income.

Sergithang: Sergithang is one of the 12 Gewogs under Tsirang Dzongkhag. With 345 households and 5 chiwogs, it has around 3031 population. The Gewog has a primary school, a BHU, 2 ECCDs and a NFE centre. Like in any other parts of the country, public of this Gewog depends on farming and lives stockraring. And there are many youths who are keenly interested in piggery and poultry farming. There are also few who took up the fishery farming. Besides many other income generating activities, early chilli is one of the main activities through which the public of this Gewog earns. Sergithang Gewog consists of five chiwogs namely Tashithang, Sergithang Toed, Sergithang Maed, Norboogang and Samdendzong. The Gewog has an area of 45.93 sq km with the elevation rising from 900 to 1500 meters above sea level.

Tsirangtoed: Tsirangtoed Gewog comprises five chiwogs: Tsirangtoed, Soentabsa, Kabelshing, Wongphu, and Tongshina. Spanning an area of 30.3 square kilometres, the Gewog is situated at an elevation ranging from 800 to 1300 meters above sea level. Agricultural land use is primarily focused on wetland cultivation, with paddy and maize grown during the summer and mustard and potatoes in the winter. Oranges and cardamom serve as key cash crops for local farmers. The Gewog includes a total of 292.93 acres of dry land and 157.41 acres of wet land, along with livestock rearing, which provides essential nutrition for household use and generates income.

While the Gewog has relatively good road access, one village is located over two hours' walk from the nearest road head. Agricultural and livestock extension services are provided by stationed extension staff, along with forestry services from a nearby Range office. Health services are accessible through a Basic Health Unit (BHU grade II) and Damphu General Hospital. In terms of education, the Gewog is equipped with a Lower Secondary School, an extended classroom centre (ECR), and an Early Childhood Care and Development Centre, enhancing educational opportunities for the community. Additionally, all chiwogs have access to electricity and mobile connectivity.

6.2 Findings: Patshaling Gewog

A. Food Availability

Most food items, particularly vegetables, are locally produced and readily available within the community. However, during the monsoon season, access to fresh produce declines significantly due to road blockages and supply chain disruptions. As a result, shortages of food products are common when weather conditions impede transportation. Additionally, while there is a good number of locally available foods, few community members have some understanding of balanced diets, which could guide their food choices towards more nutritious options.

Own production

The following table shows the varieties of crops (cereals, vegetables, and fruits) that are grown and their planting and harvesting seasons in Patshaling gewog as per the FGDs.

Table 29: Food Availability Calendar- Patshaling Gewog

Sl. No	Crops Grown	Bhutanese months											
		1	2	3	4	5	6	7	8	9	10	11	12
1	Potato												
2	Sag												
3	Beans												
4	Pumpkin												
5	Cabbage												
6	Broccoli												
7	Radish												
8	Chilli												
9	Maize												
10	Mango												
11	Peach												
12	Ginger												
13	Plum												



The table indicate that seasonal availability of the vegetables with some months with no vegetables at all. For example, the third and ninth months of the Bhutanese calendar, there are no vegetables.

Food shortages

The following table show the months of food shortages among the FGDs participants.

Table 30: Food Shortages Calendar-Patshaling

Sl. No	Food Items	Bhutanese months												Remarks
		1	2	3	4	5	6	7	8	9	10	11	12	
1	Rice													
2	Maize													
3	Chilli													
4	Beans													
5	Cauliflower													
6	Cabbage													
7	Broccoli													

The above table show that Patshaling gewog is fully dependent on imported rice for their daily consumption while maize is available only few months in a year.

B. Food Accessibility

Accessibility to food markets presents several challenges for the residents. Physical barriers such as the distance to markets and a lack of reliable transportation hinder the community's ability to procure food. The high market prices, especially for off-season products, further complicate access. Although there are no significant social barriers, some households practice vegetarianism and choose to abstain from meat, which influences the availability of certain food products for these families.

Distances to food source

The following table show the distances to the food sources (groceries) as per the FGD.

Table 31: Distance to Food purchase source- Patshaling

Sl. No.	Sources for purchase (shops)	Walking distances (Minutes)				Distance by car (Minutes)		
		15	30	60	60+	15	30	60
1	Rice						1	8
2	Oil	2						8
3	Salt	6	3					1
4	Meat		1					9
5	Egg	3		1			4	
6	Tea-leaf	2	2	1				4
7	Vegetables							9
8	Sugar	6	1					4

The above table show that most of the basic grocery items are locally available within walking distances, many of the participants travel by car for their food purchases especially rice. This does not indicate difficulties to reach the food sources as pointed out in the KII.

Purchase frequencies

The following table shows the items that are purchased and the frequency of purchases made by the participants of the FGD.

Table 32: Food Purchase Frequency- Patshaling

Sl. No	Food Items	Daily	Weekly	Monthly	Every 3 months	Every 6 months	Once a year
1	Rice			10	1		
2	Oil			11			
3	Salt			11			
4	Meat		2	6	2	1	
5	Egg		6	4			
6	Tea-leaf			9	2		
7	Vegetables		8	3			
8	Sugar		4	7			

The above table indicate most of the purchases are imported food items. The table also indicate that the participants consumed a variety of food including meat and eggs and fulfil their nutritional requirements.

C. Food Affordability

The affordability of food has become a pressing concern within Patshaling Gewog, particularly as prices have surged in response to demand. Many community members rely heavily on vegetable sales and daily wages, yet they often struggle to meet their basic nutritional needs due to high prices. Economic constraints force households to allocate their entire earnings to purchasing essential food items, leaving little room for dietary variety or quality.

Sources of income

The following the shows the income sources and income as identified during FGDs by the participants.

Table 33: Food Sources and Income Range-Patshaling

Sl. No.	Income source	Income range (Nu. in 000)									Total HHs	
		Oct-20	21-30	31-40	41-50	51- 60	61-70	71-80	81-90	91-100		Above 100
1	Cardamom	2			1						1	4
2	Poultry							1				1
3	Piggery			1	1	1						3
4	Vegetables	3	2	1	1	2	1	1				11
5	Wages	4			1							5
6	Business								1			1

As seen above, the majority of the participants earn from the sale of vegetables followed by wage and cardamom with most of the participants income ranging from Nu. 10000 to Nu. 20000. This indicates very limited purchasing power of the participants of the FGDs.

D. Consumption Patterns

Consumption patterns in Patshaling Gewog predominantly revolve around rice and curry, typically consumed three times a day, reflecting consistent dietary habits across households. While some variation exists, such as occasional flour-based dishes or fried vegetables, overall dietary diversity is limited. These consumption habits are observed equally among breastfeeding women and other community members, highlighting a lack of variation that could enhance nutritional intake.

Consumption frequency

The following table shows the food items and their consumption frequencies as discussed in their FGDs during the consultations.

Table 34: Frequency of Food Consumption-Patshaling

Sl. No	Food items	Daily	Once in a week	Once in a month	Remarks
1	Cereal				
a.	Rice	21			
b.	Maize	2	1	8	
2	Vegetables	21			
a.	Potatoes	4	7		
b.	Beans		1	10	
c.	Broccoli	3	5	3	
3	Fruits				
a.	Oranges		1	10	Seasonal
b.	Mangoes			11	Seasonal
c.	Banana	3	6	2	Seasonal

The above table shows that typical Bhutanese consumption habits – rice with vegetables three times a day. However, the above table indicate that Patshaling gewog consume more varieties of foods even though consumption frequencies are monthly. In addition, the purchase item indicate they also consume meat and eggs at least monthly which is not shown in this table.

Preparation methods

The following shows the preparation methods as discussed during the FGDs.

Table 35: Preparation Methods-Patshaling

Sl. No	Food items	Boil	Steam	Fry	Roast	Raw	Remarks
1	Cereal						
I.	Rice	11					
	Maize	7			4		
2	Vegetables						
a.	Potatoes	6		5			
b.	Beans	6		5			
c.	Broccoli	4	1	6			
3	Fruits						
a.	Oranges					11	Seasonal
b.	Mangoes					11	Seasonal
c.	Banana					11	Seasonal

The preparation methods consist mainly of boiling and frying while fruits are raw on a seasonal basis.

E. Nutrition awareness and quality

Patshaling Gewog exhibits a notable level of nutrition awareness, particularly among pregnant and breastfeeding women who receive guidance from health officials at local health facilities (BHU). However, despite this awareness, many residents lack comprehensive knowledge of the nutritional value of local food products and often rely on markets for their groceries. Enhancements in educational outreach could deepen this understanding and improve dietary choices.

There are no reported cases of nutritional deficiencies within the community. This positive status can be largely attributed to the awareness efforts of health officials who educate residents about nutrition. While community members have some knowledge of healthy eating, gaps remain in their understanding of the nutritional value of locally available foods. Promoting a more balanced diet and increasing familiarity with nutritious food options could further strengthen community health.

6.3 Findings: Sergithang

A. Food Availability

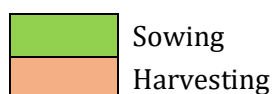
Sergithang Gewog benefits from the local production of staple foods such as rice, millet, maize, and buckwheat, which play significant roles in household diets. Home gardens are a primary source of food for many families, supplemented by agricultural farms and local markets. However, the community faces challenges, particularly during the winter months when green foods become scarce. Key food items like meat, fresh fruits, onions, and leafy vegetables are often difficult to find locally, exacerbating food insecurity. The supply chain for food is unreliable, characterized by frequent shortages, transportation issues, and inadequate storage facilities, all of which hinder the community's access to the food they need.

Own production

The following table shows the varieties of crops grown and their availability during the year as per the FGDs carried out with the participants.

Table 36: Food Availability Calendar-Sergithang

Sl. No	Crops Grown	Bhutanese months											
		1	2	3	4	5	6	7	8	9	10	11	12
1	Potato												
2	Sag												
3	Beans												
4	Pumpkin												
5	Cabbage												
6	Broccoli												
7	Radish												
8	Chilli												
9	Rice												
10	Maize												
11	Millet												
12	Buckwheat												
13	Mango												
14	Peach												
15	Ginger												
16	Plum												



Though the food varieties are rich, the table indicate seasonal variations of the crops in the availability.

Food shortages

The following table shows the food shortages experienced by the participants of the FGDs.

Table 37: Food Shortages Calendar-Sergithang

Sl. No	Food items	Bhutanese months												Remarks
		1	2	3	4	5	6	7	8	9	10	11	12	
1	Rice													
2	Maize													
3	Buckwheat													
4	Millet													
5	Mustard													
6	Wheat													

The above table show the shortages are mainly the cereals unlike the other gewogs.

B. Food Accessibility

Accessing food markets or stores proves challenging for many residents. The distance to these markets coupled with a lack of transportation makes it difficult for certain community segments to obtain necessary food items. Inflation and rising prices further complicate food access, putting economic pressure on households. Although there are NGOs that assist in providing food access, the absence of local food banks limits support for those in need. Some community members, particularly vegetarians, actively refrain from consuming meat, which influences their access to other food sources.

Distances to food source

The following table show the distances for the purchases of food supplies.

Table 38: Distance to Food Souce- Sergithang

Sl No	Sources for purchase	Walking distance(minutes)			Distance by Car(minutes)			Remarks
		15	30	60+	15	30	60+	
1	Home to shop	14					6	

This table further reconfirms that physical access is not a limiting factor for food purchases as was indicated in the frequencies of purchases. Most the participants are within 15 minutes of walking distances to the sources of food. This is in contrast to KII where it was that the communities face challenges to access food due long distances and road blockages.

Purchase frequencies

The following table shows the food types and frequencies of purchases made by the participants in the FGDs.

Table 39: Food Purchase Frequency- Sergithang

Sl. No	Food items	Daily	Weekly	Monthly	Every 3 months	Every 6 months	Once a year
1	Rice			21			
2	Vegetables			14			
3	Salt			8	13		
45	Sugar		21				
6	Oil		4	17			
7	Meat		17	4			
8	Egg		10	11			
9	Milk powder		16	3			

As seen in the table above, the frequencies are mostly monthly basis with on weekly basis. This indicates physical access in not a limitation for buying food items.

C. Food Affordability

Rising inflation has significantly impacted the community's ability to afford food. Older residents, in particular, struggle with the increasing costs of nutritious food, making it difficult for them to maintain balanced diets. The main sources of income include agricultural produce, livestock sales, wages, and various forms of farming (such as fruit orchards, piggery, poultry, and fisheries). While some organizations help with food affordability, these efforts are not sufficiently effective in overcoming the economic challenges faced by the community.

Sources of income

The following table shows the income sources and income ranges as discussed during the FGDs.

Table 40: Food Sources and Income Range-Sergithang

Sl. No	Income sources	Income Range (Nu.000)										Total HHs
		10-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	Above 100	
1	Vegetables	12		2								14
2	Livestock produces	1		4		2						7
3	Fruits	13										13
4	Cardamoms	14										14

The table above show that major incomes are limited four sources. Cardamom, vegetables and fruits are main sources. However, average income per income source is Nu. 10000 to Nu. 20000 which may challenge the households to purchase sufficient and nutritive foods.

D. Nutrition Quality, Awareness and Breastfeeding

The predominant dietary habit within Sergithang Gewog is centred around rice and curry, typically consumed three times per day. There is a lack of uniform dietary patterns, with younger community members sometimes opting for junk food and intermittently skipping meals. Fried meals are a common preference among residents, and traditional food preservation methods are limited mainly to drying. Although breastfeeding women are

traditionally given special foods like meat, fruits, and green vegetables, the community faces challenges in both acquiring and affording these items.

Consumption frequency

The following table shows the food items and frequencies of their consumption as per the FGD consultations.

Table 41: Frequency of Food Consumption-Sergithang

Sl. No.	Food items	Daily	Weekly	Monthly	Remarks
1	Rice	21			
2	Cabbage	6	1		
3	Beans		3	1	
4	Litchi		1	5	Seasonal
5	Mango			15	Seasonal

Similar to any other gewog under this assessment study, it is rice with vegetable curry three times a day. Though the above does not show, the purchases made indicate that meat and eggs are consumed on a monthly basis

Preparation methods

The following table shows the food preparation methods as discussed during the FGDs.

Table 42: Preparation Methods-Sergithang

S. No.	Food items	Boil	Stem	Fry	Roast	Raw	Remarks
1	Rice	6		7			
2	Cabbage	6		9			
3	Beans	3		2			
4	Litchi					x	Seasonal
5	Mango					x	Seasonal

The above table shows the methods used for preparing the food consumption dominated by boiling and frying. Only fruits are eaten raw. The food preparation methods do not vary much in all the gewogs that are surveyed for this assessment.

Community members have a reasonable level of awareness regarding nutrition, thanks to the efforts of health workers who provide education, particularly to pregnant women about the importance of a balanced diet. Despite this knowledge, residents often remain uncertain about the nutritional value of locally produced foods. There appear to be no significant misconceptions or knowledge gaps concerning the nutritional quality of commonly purchased goods.

The community expresses concern about the nutritional adequacy of their diet, particularly the reliance on rice, which is perceived as lacking in essential nutrients. There is a recognized need for increased diversity in crop production among local farmers, which could enhance food security at the district level and provide more nutritious options for community members.

6.4 Findings: Tsirangtoed

A. Food Availability

Paddy and maize are grown as the summer crop while mustard and potatoes are the main winter crops. Oranges and cardamom constitute the main source of cash income for the farmers. Livestock rearing is also an aspect of farming as it contributes required food nutrition for the personal consumption and substantial products for sale.

Most of nutritious food like vegetables and fruits are available in the communities but sold for the urban consumers due to lack of knowledge on balanced nutrition.

Water shortage is serious challenge for crop production. Most of the households' purchase food products from town mostly imported foods.

The seasonal variation is mainly due to water shortages. The communities face challenges to grow green vegetable and feed to child during the winters.

Smooth supply chain is lacking due to transportation challenges. Transportation is scarce, particularly during the rainy season when roads are occasionally blocked and it is quite challenging to get the food items that are needed at the local grocery shops. "We don't always get what we need at the local store".

Own production

The following table shows the varieties of crops and their seasonal availability as per the FGD participants.

Table 43: Food Availability Calendar- Tsirangtoed

Sl. No	Crops Grown	Bhutanese months											
		1	2	3	4	5	6	7	8	9	10	11	12
1	Sag	Planting	Planting						Harvesting		Planting	Planting	Planting
2	Beans								Harvesting			Planting	Planting
3	Pumpkin			Harvesting					Planting				
4	Cabbage								Harvesting			Planting	Planting
5	Broccoli								Harvesting			Planting	Planting
6	Radish								Harvesting			Planting	Planting
7	Chilli	Harvesting						Planting	Planting				
8	Rice					Harvesting					Planting	Planting	
9	Maize			Harvesting						Planting			
10	Mango						Planting						
11	Peach					Planting							
12	Ginger			Harvesting									Planting
13	Plum					Planting							

	Planting
	Harvesting

The above table indicate that Tsirangtoed gewog is favourable for good varieties of crops but like other gewogs face seasonal variations in their availability.

Food shortages

The following table shows the seasonal shortages of food items from own production as discussed during the FGD.

Table 44: Food Shortages Calendar-Tsirangtoed

Sl. No	Food Items	Bhutanese months												Remarks
		1	2	3	4	5	6	7	8	9	10	11	12	
1	Rice													
2	Maize													
3	Buckwheat													
4	Millet													
5	Wheat													
6	Mustard													

Similar to the Sergithang gewog, the above indicates shortages of cereal crops and not vegetables. The two gewogs share similar agroecological conditions.

B. Food Accessibility

Grocery stores exist within the Gewog, but they often lack a comprehensive range of food items, particularly fresh produce during off-seasons. The high costs of available foods make affordability a critical issue, leading many residents to travel to Damphu town for essential grocery shopping. This journey is not only time-consuming due to the distance but also expensive, which further strains the community's capacity to access a broad range of food offerings. Seasonal and geographical limitations complicate the consistency of food supply, and many households are unable to obtain adequate nutrition as a result.

Distances to food source

The following table shows the distances that the FGD participants have to travel to purchase food items.

Table 45: Food Shortages Calendar-Tsirangtoed

Sl. No	Source for Purchase (Shops)	Walking Distances (Minutes)			Distance by car (Minutes)			Remark
		15	30	60+	15	30	60+	
1	Home to Shop	9	3	2				
2	Home to shop by vehicle				4	3	10	

The above table indicate that most the FGD participants can purchase from shops within 30 minutes of walking distances while a few takes more and another to reach the grocery shops. The table also indicate they have option to travel by car to shops with majority participants more than an hour's drive.

Purchase frequencies

The following table shows the food items purchased and their frequencies as per the FGDs which are mostly imported.

Table 46: Food Purchase Frequency-Tsirangtoed

Sl. No	Food items	Daily	Weekly	Monthly	Every 3 months	Every 6 months	Once a year
1	Rice			9			
2	Oil		3	6			
3	Vegetable		9	2			
4	Salt		2	7			
6	Meat		1	7			
7	Egg		6				
8	Tea-Leave		1	10			
9	Dairy Product		8	1			
10	Sugar		1	7			
11	Junk Food	5	4	2			
12	Fruits	1	5				
13	Alcohol	2	3	1			

Most of the participants make their purchases weekly and monthly as seen from the above table. This indicate that the physical access to food is not a limiting factor as opposed to information by the KIIs. The purchased food items are mainly imported. The nearness of the grocery shops to the villages allows the households to purchase the food items on daily and weekly as illustrated by the above table.

C. Food Affordability

The community faces steep increases in food prices, with staples once costing Nu. 800-1000 now rising to Nu. 1350-1500. This inflation disproportionately impacts vulnerable groups, including youth and the elderly, who struggle to afford basic groceries. The primary sources of livelihoods—agriculture, livestock, and wage labour—are often insufficient to cover the rising costs of food, forcing families to spend their entire income on sustenance.

Sources of income

The following table shows the income sources and income ranges from different sources discussed during the FGDs.

Table 47: Food Sources and Income Range-Tsirangtoed

Sl.No	Income Source	Income Range (Nu.000)										Total Hhs
		10-20	21- 30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	Above 100	
1	Livestock	2										2
2	Vegetable	3										3
3	Orange	1		1	1					1	1	5
4	Salary	3								1	1	5
5	Cardamon	2										2
6	Poultry	1										1
7	Banana			1	1							2

The above indicate that the FGDs participants has very limited income with majority having income of Nu. 10000 to 20000. The table also indicate many households lack sources of income.

D. Consumption Patterns

Despite the availability of nutritious local produce, consumption patterns remain predominantly centred around rice and vegetable curry served three times daily, with occasional inclusion of flour-based foods. There appears to be a minor shift toward increased intake of fruits and livestock products; however, these changes are not widespread. The preference for fried vegetables also reflects a lack of variety in dietary habits. Many nutritious local foods are consumed more by urban dwellers than by the residents of Tsirangtoed Gewog themselves, indicating a disconnect between local production and consumption.

About half the households and population refrain from eating meat due religious association and beliefs.

Consumption frequency

The following table shows the food items and their consumption frequencies as has been discussed during the FGDs.

Table 48:Frequency of Food Consumption-Tsirangtoed

Sl. No.	Food items	Daily	Once in a week	Once a month	Remarks
1	Cereals	17			
2	Vegetables	17			
3	Fruits		1	5	Seasonal

The table above indicate, like all the other gewogs, cereals mainly rice consumed with vegetables three times daily. The table also indicated limited varieties of food consumed. However, the purchase list of food items indicates consumption of more varieties of food including meat, eggs and fruits at least monthly.

Preparation methods

The following table shows the methods used to prepare foods as discussed during the FGDs.

Table 49:Preparation Methods-Tsirangtoed

Sl. No.	Food items	Boil	Steam	Fry	Roast	Raw	Remarks
1	Cereals	10		2			
2	Vegetables	6	1	8			
3	Fruits					8	Seasonal

The table above shows the most common method of food preparation is boiling and some food items are fried. Fruits are eaten raw whenever available and sometimes purchased.

E. Nutrition Quality, Awareness and Breastfeeding

Awareness of nutrition within Tsirangtoed Gewog is developing, particularly through healthcare initiatives that educate pregnant women on nutritional needs at health centres. While there is some understanding of what constitutes a healthy diet, deeper knowledge regarding the specific nutritional value of available foods is often lacking. Initiatives to expand nutritional education beyond maternal health could cultivate broader awareness and encourage healthier dietary practices across all age groups.

While various locally cultivated crops offer potential for improved nutrition, awareness regarding nutritional quality remains limited among community members. Although residents have access to various foods, they often lack an understanding of nutrition quality and the implications for health. Misconceptions about nutrition persist, with some community members unaware of the health benefits of certain foods.

Traditional beliefs like pregnant women should consume papaya and fresh pork and green vegetables after delivery exist in the gewog.

6.5 Thematic Analysis of Qualitative Behaviour Research in Tsirang District

This section synthesizes the key themes that emerged from qualitative data collected across Patshaling, Sergithang, and Tsirangtoed gewogs in Tsirang Dzongkhag. Drawing from focus group discussions and key informant interviews, the analysis highlights recurring behavioural patterns and systemic barriers that influence food availability, accessibility, affordability, and nutritional outcomes.

Table 50:Thematic Findings in Tsirang District

Theme	Description	Illustrative Findings
1. Agro-ecological Diversity & Farming Systems	Distinct elevation zones drive cropping patterns and inputs	Patshaling: uplands maize/wheat/mustard; lowlands paddy/wet wheat; Sergithang: chilli, piggery, poultry, fishery; Tsirangtoed: paddy/maize summer,

		mustard/potatoes winter; oranges & cardamom
2. Seasonal Availability & Water Constraints	Monsoon blockages and dry-season scarcity disrupt both crop & livestock yields	Monsoon road blockages limit fresh produce; winter water shortages curtail vegetable cultivation; months with zero vegetable availability in Patshaling (month 3 & 9)
3. Market Access & Supply-Chain Vulnerabilities	Distance, transport reliability and high off-season prices shape purchasing behaviour	Villages >2 hrs walk face high transport costs; local ECCDs supply chains; high inflation forces ~70% income on staples
4. Livelihood Diversification & Income Security	Heavy reliance on a narrow basket of cash crops & wage labour limits resilience	Patshaling incomes from vegetables (Nu 10–20k), cardamom, wages; Sergithang youth in livestock but incomes low
5. Nutrition Awareness & Feeding Practices	Basic nutrition knowledge is present, but application and dietary diversity are limited	EBF challenges due to early work return; rice–curry thrice daily; meat, eggs & fruits monthly; limited understanding of nutrient sources
6. Gender & Care Burdens	Women’s dual roles in agriculture and caregiving impede optimal infant feeding and own nutrition	Women-headed households most food-insecure; early porridge introduction prevalent
7. Institutional & Infrastructure Gaps	Demand for mechanization, improved inputs, storage and extension services remains unmet	Requests for backhoes, power tillers, hybrid seeds, water tanks; BHUs and schools lack agriculture-nutrition integration

6.6 Recommendations Based on Thematic Insights

To enhance food and nutrition security in Tsirang, the study recommends the following:

1. Optimize Water Resources:
 - Install community rainwater harvesting and storage tanks
 - Construct check-dams and gravity-fed pipelines for irrigation

2. Strengthen Market Linkages & Value Chains:
 - Establish seasonal aggregation points with basic cold storage
 - Organize mobile pop-up markets during monsoons
3. Promote Nutrition-Sensitive Cropping:
 - Introduce fast-maturing, drought-tolerant vegetables for lean months
 - Train farmers in integrated pest and soil-fertility management
4. Empower Women & Support Caregivers:
 - Create community childcare cooperatives for EBF support
 - Provide women-focused micro-credit for home garden and small-livestock enterprises
5. Enhance Institutional Outreach:
 - Fast-track mechanization requests via LG-BRECSA partnership
 - Integrate agriculture-nutrition modules into BHU and school programs
6. Expand Nutrition Education & Behavior Change:
 - Conduct participatory cooking demos on nutrient retention
 - Develop chiwog-level BCC materials in local dialects
7. Monitor & Adapt Interventions:
 - Establish community-led monitoring of food-security and dietary diversity
 - Hold quarterly learning workshops to refine approaches

7. Trongsa Dzongkhag



FGD participant at Langthel gewog

7.1 Introduction

Trongsa Dzongkhag, located in central Bhutan, is characterized by its diverse topography, forested landscapes, and scattered rural settlements. The dzongkhag's agriculture is primarily subsistence-based, with limited connectivity and market access in its more remote gewogs. This section focuses on three gewogs: Korphu, Langthel, and Nubee which were selected for qualitative behavioural research due to their varied agro-ecological conditions and differing levels of accessibility.

Korphu Gewog: Korphu Gewog is a remote, mountainous administrative block known for its cultural heritage and traditional lifestyle. Settlements are widely scattered, and road access is limited, posing significant challenges to service delivery and market connectivity. Most households rely on subsistence farming, cultivating crops such as maize, buckwheat, and vegetables, and raising livestock for dairy and meat. Given its isolation and fragile infrastructure, Korphu is highly vulnerable to seasonal food shortages and is a priority for nutrition-sensitive interventions.

Langthel Gewog: Located in southern Trongsa, Langthel Gewog benefits from relatively better road connectivity and a more favourable agro-climatic zone compared to other gewogs in the district. The gewog's lower elevation supports the cultivation of a wide range of cereals, fruits, and vegetables, and many households also rear livestock. Despite this production potential, rural and remote chiwogs such as Wangling and Phrumzur continue to face challenges in accessing diverse and nutritious foods year-round. Langthel reflects the tension between agricultural opportunity and persistent nutrition and access barriers.

Nubee Gewog: Nubee Gewog is one of the most isolated and least developed areas in Trongsa. With rugged terrain, minimal road access, and widely dispersed settlements, communities in Nubee depend largely on subsistence agriculture and livestock rearing. The gewog experiences multiple vulnerabilities including limited market access, seasonal food insecurity, and poor dietary diversity. These conditions make Nubee a key target for resilience-building and nutrition-sensitive agriculture approaches.

7.2 Findings: Korphu

A. Food Availability

Subsistence farming dominates the gewog. Households cultivate traditional crops like maize, rice, buckwheat, potatoes, and a variety of vegetables, depending on altitude and microclimate. Fruits like oranges, guava, peach, banana and walnut are also grown. Livestock such as cattle, poultry, and pigs supplement diets and incomes, though productivity remains low due to limited veterinary services and traditional practices.

Wild foods (e.g., mushrooms, ferns, and fruits) contribute to seasonal diversity but are not consistently available. Post-harvest losses and limited crop diversity contribute to seasonal food shortages or a lack of nutrient-rich foods. The food availability affected by seasonal variations due to climate effects. The wild animal damages also affect the food availability. Vegetables are abundantly available in summer, but insects and diseases infestations are high. The supply chains are reliable and sufficient but labour shortages, high wage rate and wildlife conflict are challenges.

Own production

The following table shows the varieties of crops and their production seasons that the FGD discussed and agreed.

Table 51: Food Availability Calendar- Korphu

Sl. No	Crops Grown	Bhutanese Calendar												
		1	2	3	4	5	6	7	8	9	10	11	12	
1	Sag													
2	Cabbage													
3	Potato													
4	Maize													
5	Broccoli													
6	Pumkin													
7	Rice													
8	Ginger													
9	Chilli													
10	Radish													
11	Beans													
12	Buckwheat													
13	Carrot													
14	Cucumber													
15	Squash													
16	Oranges													
17	Peach													
18	Guava													

	Planting/sowing
	Harvesting

The above table shows a large range of crop varieties that are grown and their seasonality in Korphu gewog. As seen above as many as 18 varieties of crops are grown that include cereals, vegetables, fruits and spices.

Food shortages

The following table shows the shortages that the FGD participant experienced as expressed during the FGD.

Table 52: Food Shortages Calendar-Korphu

Sl. No	Food items	Bhutanese months												Remarks
		1	2	3	4	5	6	7	8	9	10	11	12	
1	Cabbage													
2	Rice													
3	Pumpkin													
4	Potato													
5	Maize													
6	Beans													
7	Carrot													
8	Chilli													

The above table shows that the participants faced shortages in the main staple food – rice – for 7 months in a year while maize shortage is for 2 months. However, it must be noted that maize is no more consumed by humans but fed to the animals. Vegetable shortages is not seen severe compared to many other gewogs.

B. Food Accessibility

There is no proper market in the gewog. Market access is constrained due to poor road conditions and long travel times to Trongsa town, making store-bought food expensive. Roads become impassable during monsoons, further restricting movement and food access.

Certain households especially those with PWDs, elderly citizens and women headed households do not earn enough income to purchase food. Community members help those low-income households with labour contribution to grow their food on their land.

Purchase frequencies

The following table shows the food items purchased and their frequencies that the FGD identified and agreed.

Table 53: Food Purchase Frequency-Korphu

Sl. No.	Food items	Daily	Weekly	Monthly	Every 3 months	Every 6 months	Once a year
1	Rice			4		3	1
2	Oil			10	1		
3	Meat			10	1		
4	Salt			10	1		
5	Sugar			10	2		
6	Milk powder			8			3
7	Tea leaf			11	1		
8	Cheese			12			
9	Milk			6	3		1
10	Egg			9		1	

As seen in the above table, most of the items purchased imported items and almost all the participants made monthly purchases. The above table indicate that most of the FGD participants consume meat, cheese and eggs at least on monthly basis.

Distances to food source

The following table shows the distances that the FGD participants have to travel for their food purchases.

Table 54: Distance to Food Source- Korphu

Sl. No	Sources (shops) for purchases	Walking distances (minutes)				Distances by car (minutes)		
		15	30	60	60+	15	30	60
1	Rice			4				
2	Oil	1		4				
3	Meat			1				
4	Milk powder	1		1				
5	Cheese	1		3				
6	Egg	1		3				
7	Milk	1		1				

The above table indicate that most of the FGD participants travel one hour from their homes. This indicates that Korphu gewog lacks grocery shops in the chiwogs and villages. Korphu gewog is also one of the remote gewogs under Trongsa Dzongkhag which explains the limited grocery shops in the gewog.

C. Food Affordability

The prices of have increased over the years. The poor and women headed households suffer from low quality of food. 30% of the income is spent on food. The key issues are high transportation costs inflate food prices, low household income reduces ability to buy diverse, nutrient-rich foods and seasonal fluctuations in food prices impact affordability.

Main sources of income are cardamom and oranges with later being the preferred source due to good market value and long shelf life. Households often prioritize cheaper, energy-dense foods (like rice and oil) over fruits, vegetables, and protein-rich items.

The government supplies greenhouses and supports women vegetable group, supply subsidised seeds and jersey cows.

Sources of income

The following table shows the income sources and income ranges as discussed in the FGDs.

Table 55: Food Sources and Income Range-Korphu

Sl. No	Income sources	Income range (Nu. in 000)										Total HHs
		10-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	Above 100	
1	Cardamom								1		9	10
2	Oranges	2	5	4								11
3	Salary										1	1
4	labour										4	4
5	Diary product	1										1

The above table show that majority of the FGD participants depend on cardamom and oranges. The table also show that most of the participants earn more than Nu. 100,000/= which is unlike any other gewogs in this survey. This shows that they are not limit to access because of economic constraints.

D. Consumption patterns

There are changes in food consumption patterns influenced by income earnings and availability of resources. Income growth and resource availability has influenced food consumption. Fish, eggs, meat, chicken soup, green vegetables, fruits are becoming part food. The communities also consume preserved food items like pickles. However, the main dietary pattern is rice with vegetable curry 3 times a day. Sometimes pan cakes are also consumed.

Wildlife conflict affecting food production, marketing difficulties for agricultural products, lack of awareness about nutrition and shortage of vegetable seeds are affecting the consumption habits in the communities.

Consumption frequencies

The following table shows the types of food and the consumption frequencies discussed during the FGDs.

Table 56: Frequency of Food Consumption-Korphu

Sl. No.	Food items	daily	Once a week	Once a month	Remarks
1	Cereals	12			
2	Vegetables	12			
3	Fruits				Seasonal

The table above shows limited dietary sources with daily consumption cereals mostly rice and vegetables. However, the food purchases show that the FGD participants purchase meat, eggs, milk and cheese at least monthly which means the dietary diversity is more than shown in the table above.

Preparation methods

The following presents the preparation methods for food as discussed by the participants in the FGD.

Table 57: Preparation Methods-Korphu

Sl. No.	Food items	Boil	Steam	Fry	Roast	Raw	Remarks
1	Cereals	10		3			
2	Vegetables	10	2	3		4	
3	Fruits					12	Seasonal

Like most of the FGDs, the above table show that the predominant cooking method is boiling. However, some of the participants also consumed raw vegetables in addition to fruits which are normally consumed raw.

E. Nutritional Quality and Awareness

Nutritional knowledge is low, limiting effective use of available food. 70% feel that their nutritional quality is adequate and no health issue. However, it is also reported that the people rarely consume legumes or pulses. Limited physical and economic access to nutritious food.

There are changes in consumption. People eat regularly and more fish, egg, meat, chicken soup, green vegetables and fruits. Easy access and affordability (income growth) have brought about changes in the food consumption.

Dependence on cash crops like cardamom and oranges has led to less emphasis on growing vegetables and fruits for local consumption, potentially reducing the availability of nutritious food.

7.3 Findings: Langthel Gewog

A. Food Availability

Crops that are grown in the gewog are paddy, wheat, millet, maize, bitter and sweet buckwheat, quinoa and mustard. Fruits like orange, guava, banana, avocado, sugarcane, jackfruit, litchi, mango, peach and cucumber are grown.

Livestock like cattle, poultry, and pigs are common, contributing to eggs, milk, butter, cheese and meat production. Wild foods (NWFPs) like ferns, mushroom, Pachha (cane shoot), Damroo, wild avocado, wild mango are available. Seasonal variations exist with less availability of vegetables during winter season and pests and diseases infestations during summer. Limited storage and processing facilities contribute to post-harvest losses, especially for perishables.

Main source of foods is own production of cereals and vegetables while additional food items are mainly imported items available in the local shops.

Women are mainly responsible for food production: They have to work in the field for paddy cultivation and home garden works.

Challenges to food availability are wildlife conflict for which the communities feel the need for electric or chain link fencing. The good quality and readily available vegetables seeds are seen as priority increase the food availability.

Own production

The following table shows the crops grown and their productions as discussed in the FGD under Langthel gewog.

Table 58: Food Availability Calendar- Langthel

Sl. No	Crops Grown	Bhutanese months											
		1	2	3	4	5	6	7	8	9	10	11	12
1	Maize					Harvesting				Planting			
2	Wheat				Planting							Harvesting	
3	Rice					Harvesting						Planting	
4	Millet						Harvesting					Planting	
5	Buckwheat			Harvesting			Planting						
6	Mustard	Planting								Harvesting			
7	Orange							Harvesting					Planting
8	Quinoa	Planting								Harvesting			
9	Sag									Harvesting		Planting	Planting
10	Cabbage							Harvesting				Planting	
11	Pumpkin					Harvesting				Planting			
12	Beans									Harvesting	Planting		Planting
13	Walnut			Harvesting							Planting		
14	Carrot									Harvesting			
15	Tomato			Harvesting				Planting					
16	Garlic				Planting					Harvesting			
17	Potato		Harvesting										
18	Cardamom					Harvesting						Planting	
19	Squash			Harvesting							Planting		
20	Bitter gourd					Harvesting				Planting	Planting		
21	Onion							Harvesting				Planting	
22	Mango						Planting						
23	Guava										Planting	Planting	
24	Avocado										Planting	Planting	
25	Chilli		Harvesting				Planting	Planting					
26	Banana											Planting	
27	Peach					Planting							
28	Sugarcane										Planting	Planting	

	Planting
	Harvesting

The FGD of Langthel gewog listed the highest number of crops grown – 28 varieties – as seen in the above table. The FGD listed greater number of cereals, vegetables and fruits. This could be due to favourable climate conditions and land quality.

Food shortages

The following table shows the shortages of food items that FGD participants identified during the discussions.

Table 59: Food Shortages Calendar-Langthel

Sl.No	Food Items	Bhutanese months												Remarks	
		1	2	3	4	5	6	7	8	9	10	11	12		
1	Rice														
2	Chilli														
3	Dairy products														
4	Cabbage														
5	Oranges														
6	Mango														

The above table shows the shortages of main items that are consumed daily like rice, chilli and dairy products (Cheese). In spite of the production of large varieties of crops (cereals, vegetables and fruits) the gewog is not food and nutrition secure.

B. Food Accessibility

Road connectivity is better compared to more remote gewogs in Trongsa. Weekly markets and proximity to Trongsa town improve access to purchased food items. Due to lack of proper market all types of vegetables are not easily available. Remote chiwogs within Langthel still face seasonal accessibility issues during monsoons or roadblocks.

The marketing challenges that the households face in selling their products, their sources of income are limited and therefore cannot vegetables and fruits that they like and nutritious. so that when they buy from Villages social stigma to livestock such as pork, beef and chicken people restrain from buying and consuming these meat items.

Purchase frequencies

The following table shows the food items that are purchased and the frequencies of their purchases as discussed in the FGD.

Table 60: Food Purchase Calendar- Langthel

Sl.no	Food items	Daily	Weekly	Monthly	Every 3 months	Every 6 months	Once a year
1	Rice			8	8	1	
2	Milk powder		9	11			
3	Oil		1	16	1		
4	Sugar		15	3			
5	Salt			18			
6	Cheese		7	6	5		
7	Chilli		4	14			
8	Flour			12	6		
9	Soup		1	2	13	2	
10	Egg		3	15			
11	Meat			1	7		
12	Tea leaf			11	6	1	

The above show, like most of the gewogs, that most of the participants to the FGD make their monthly and some weekly. This is most likely because of the easy physical accessibility since the gewog is well connected with roads and grocery shops are easily accessible.

Distances to food source

The following table shows the distances to the food sources (groceries) as discussed in the FGD.

Table 61:Distance to Food Source-Langthel

Sl. No	Sources (shops) for purchases	Walking distances (minutes)				Distances by car (minutes)		
		15	30	60	60+	15	30	60
1	Rice	3				4		3
2	Oil	3				6		4
3	Meat					5		4
4	Milk powder	3				7		
5	Cheese	3				6		3
6	Egg		4			6		3
7	Sugar	3				6		2

The above shows that most of FGD participants can access food items both on foot and by car. Most of the participants are within 15 minutes of walking distances. Similarly, the driving distance is also within minutes for most of the participant while some indicated that they need to travel an hour by car to the grocery shops.

C. Food Affordability

Road access has improved local trade and market participation for some farmers. Not all households benefit equally from cash crop trade; marginal farmers may still struggle. The prices of food have been increasing with most households resorting to medium price foods. Incomes are not able to meet the expenditure. The sources of income for food purchases are from sale of vegetables, livestock products, cash crops such as oranges and cardamom, and off farm contract work (labour wage). 80 percent of the income is spent on food.

Main expenses are on foods, drinks, school children, rituals, festivals and transportation. There are risks that households to sell nutritious food (e.g., eggs, fruits) for cash rather than consume them, reducing diet quality.

Sources of income

The following table shows the sources of income and incomes ranges as discussed by the Langthel gewog participants during the FGDs.

Table 62: Food Sources and Income Range-Langthel

Sl. No	Income sources	Income Range (Nu. In 000)										Total Hhs
		10-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	Above 100	
1	Cardamom									2	3	5
2	Orange	6	13									19
3	Vegetables	5										5
4	Salary/ Remittance										1	1
5	Diary Products	2		2	2							6
6	Contract/ labour				1	1	1	2		2		7

The above table shows that main income is from oranges followed by labour wage and dairy products. The table also show the average income of Langthel is better than most of the gewogs under this research besides Korphu. This indicate that economic condition is more favourable to access the foods.

D. Consumption Patterns

Dietary habits follow 3 times meal a day that consist of rice with vegetable curry. Occasionally some traditional foods like Dengo (dough), khuli (pan cake out of buckwheat), kepta (flat bread) made out of wheat flour is eaten with curry. Dried vegetables are stored and consumed during the off seasons. Pregnant women and breastfeeding mothers are given more fruits and vegetables for 2 to 3 months.

Consumption frequencies

The following table presents the food items consumed and consumption frequencies as discussed by the participants in the FGD.

Table 63: Frequency of Food Consumption-Langthel

Sl. No.	Food items	Daily	Once in a week	Once in a month	Remarks
1	Cereals	18			
2	Vegetables	18			
3	Fruits		10	5	Seasonal

Similar to the results of other FGDs, the table above shows limited dietary sources with daily consumption cereals mostly rice and vegetables consumed three times daily. However, the food purchases show that the FGD participants purchase meat, eggs, milk and cheese at least monthly which means the dietary diversity is more than shown in the table above.

Preparation methods

The following shows the food preparation methods that the FGD participants adopt as per their discussions.

Table 64: Preparation Methods-Langthel

S. No.	Food items	Boil	Steam	Fry	Roast	Raw	Remarks
1	Cereals	18					
2	Vegetables	12	3	4	2	3	
3	Fruits					13	Seasonal

The above table show that while cereals which mainly rice is boiled, there is some variations in the preparation vegetables, some even consuming them raw. The preparation methods by this FGD are same or similar to most the FGDs.

Nutrition Awareness

The communities lack awareness on nutrition. Most of the participants are not aware of how they can get nutrition from which type of foods.

7.4 Findings: Nubee gewog

A. Food Availability

Food production in Nubee is predominantly for household consumption, with only a small surplus sold or bartered. Varieties of fruits, cereal and vegetables and livestock are grown and reared and are available in the communities. Cereals like wheat, barley, buckwheat, rice and maize. vegetables like potatoes, sag, radish, cabbage, garlic, chilli, carrot and mustard are grown in the gewog.

Livestock rearing of cattle, poultry, and some pigs contribute milk, butter and cheese, eggs, and meat, but in modest amounts.

Wild edibles (NWFPs) like fiddlehead ferns and mushrooms are seasonally available important sources of food.

Mostly rice is purchased from the market and vegetables are mostly from their own farm and home garden. Most wheat, buckwheat and maize are not consumed, they use as feed for livestock.

Women carry the dual burden of farming and caregiving, affecting household food management. Almost all women are the one who is doing food production like working on home garden. During season time vegetables are available in all villages and during off season it is not available in very villages, it challenges for them by seasonal production. Winter seasons are more challenging as water are the main problem for home gardening

Climate vulnerability: Erratic weather patterns (hail, drought) and post-harvest losses due to lack of storage and preservation facilities affect food security.

For production government supply green house and irrigation system for cost sharing.

Own production

The following table shows the varieties of crops and their seasonal production and availability.

Table 65: Food Availability Calendar-Nubee

Sl. No	Crops Grown	Bhutanese months											
		1	2	3	4	5	6	7	8	9	10	11	12
1	Wheat												
2	Buckwheat												
3	Maize												
4	sag												
5	Butter cheese												
6	Potatoes												
7	Beans												
8	Radish												
9	Pumkin												
10	Carrot												
11	Broccoli												

	Sowing
	Harvesting

The above table indicates the availability of the crops grown – carrot and sag and dairy products – butter and cheese – throughout the year. This is encouraging that some sort of nutritious food is always available for health population.

Food shortages

The following table shows the food shortages that the FGD members experience as illustrated the discussions.

Table 66: Food Shortages Calendar-Nubee

Sl.No	Food Items	Bhutanese months												Remarks
		1	2	3	4	5	6	7	8	9	10	11	12	
1	Wheat													
2	Buckwheat													
3	Maize													
4	Sag													
5	Butter cheese													
6	Potatoes													
7	Beans													
8	Radish													
9	Pumpkin													
10	Carrot													
11	Broccoli													

The above table indicate though the participants do face food shortages, the shortages are less severe compared to other FGD groups in other gewogs. The above table also indicate the shortages months are much less compared to other FGD groups and gewog.

B. Food Accessibility

Physical and economic access to nutritious food is highly constrained by geography, infrastructure, and economic factors. Food not available in local are expensive and cannot afford like fruits, meats which will impact the nutritious foods. Food is available in market accept fruits as most of the fruits are imported. Local food production provides some buffer against market dependence. Growing interest in kitchen gardening in some areas. Food is expensive for family. Most poor and low salary are struggle more with accessing food. Poor and poorest have more child than others and even struggle to access the foods. No food banks when there is a shortage, they purchase from market. Religious associations and beliefs discourage rearing piggery and poultry. Some chiwogs remain cut off during monsoons.

Purchase frequencies

The following table shows the food items and frequencies of purchases as discussed in the FGD by the participants.

Table 67: Frequency of Food Consumption-Nubee

Sl. No	Food items	Daily	Weekly	Monthly	Every 3 months	Every 6 months	Once in a year
1	Rice			26			
2	Salt			26			
3	Milk powder			26			
4	Sugar			26			
5	Oil			26			
6	Tomatoes		26				
7	Onion		26				
8	Chilli		26				
9	Butter & cheese			26			

The above table show that most of the grocery items purchased are imported and purchased on monthly basis while vegetables are purchased on weekly basis.

Distances to food source

The table shows the food items and the distances that the FGD participants travel to purchase them

Table 68: Distance to Food Source-Nubee

Sl. No.	Sources (shops) for purchases	Walking distances (minutes)				Distances by car (minutes)		
		15	30	60	60+	15	30	60
1	Rice	6	6	14	6	16	6	3
2	Salt	6	6	14	6	16	6	3
3	Milk powder	6	6	14	6	16	6	3
4	Sugar	6	6	14	6	16	6	3
5	Oil	6	6	14	6	16	6	3
6	Tomatoes	6	6	14	6	16	6	3
7	Onion	6	6	14	6	16	6	3
8	Chilli	6	6	14	6	16	6	3

The walking distance ranges from 15 minutes to one hour and for cars, it varies from villages to villages.

C. Food Affordability

With limited sources of cash income, affordability of diverse and nutritious foods remains a major constraint. Food prices are increases when civil salary is increasing. Food prices change every year. Food not available in local are expensive and cannot afford like fruits and meats which will impact the nutritious foods. Food production labour intensive, cost of production is high and cost rises. Most of income are spent for rice, meat and fruits that comes from small-scale sale of crops and livestock products.

Transporting goods to and from Trongsa town is time-consuming and costly. The store-bought foods are often too expensive for regular consumption and therefore families prioritize energy-dense staples over nutrition-dense foods due to cost

Rice, onion, tomatoes, sugar and milk powder, butter and cheese, meat items. Purchases are made weekly and monthly but most of vegetables are grown by themselves and need not purchase. Most of the households are similar income.

Most of community member depends on dairy, vegetables, then followed by salary and remittances

Sources of income

The following table shows the sources of income and incomes ranges as discussed by the Nubee gewog participants during the FGDs.

Table 69: Food Sources and Income Range

Sl. No	Income sources	Income range (Nu. In 000)										Total HHs
		10-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	Above 100	
1	Dairy	16		3								19
2	Vegetables	19										19
3	Remittance		5									5
4	Salary										2	2

The above table shows that the main sources of income for the FGD participants come from dairy and vegetables. However, this also show that income level is low compared with other two gewogs of Trongsa that were surveyed. However, Nubee gewog does not face severe food shortages as discussed under food availability.

D. Consumption Pattern

Most cereals are consumed boil and consumed on daily basis. Legumes and pulses are consumed more than before. Vegetables are consumed boil, steam, fry and few consumed raw and roast daily, weekly and monthly basics. Fruits are consumed monthly basis as fruits are not grown, and they have depended on markets. Junk food consumption is increasing due to convenience like ease in cooking for junk food.

Breastfeeding women consumed meat after delivery while they consume normal food during the pregnancy.

Consumption frequencies

The following table presents the food consumption and frequencies of consumption discussed in the FGD.

Table 70: Frequency of Food Consumption-Nubee

Sl. No.	Food items	Daily	Once in a week	Once in a month	Remarks
1	Cereals	26			
2	Vegetables	26			
3	Fruits				Seasonal

Similar to the results of other FGDs, the table above shows limited dietary sources with daily consumption cereals mostly rice and vegetables consumed three times daily. However, the food purchases show that the FGD participants purchase meat, eggs, milk and cheese at least monthly which means the dietary diversity is more than shown in the table above.

Preparation methods

The following shows the food preparation methods that the FGD participants listed during their discussions.

Table 71: Preparation Methods

S.No.	Food items	Boil	Steam	Fry	Roast	Raw	Remarks
1	Cereals	26			22		
2	Vegetables	26	26	26	26	26	
3	Fruits						Seasonal

The table above shows that the FGD participants adopt a variety of methods especially for vegetables. Raw consumption of vegetables is also seen the above table.

Nutrition Awareness

Healthcare and nutrition services are difficult to reach for mothers, children, and the elderly. Nowadays there are cases of blood pressure, diabetes and it is believed because of consumption of nutritious food.

7.5 Thematic Analysis of Qualitative Behaviour Research in Trongsa District

The qualitative behavioural research conducted across Korphu, Langthel, and Nubee Gewogs in Trongsa District revealed several recurring themes that influence food production, access, and nutrition. The thematic analysis below presents the core patterns that emerged from FGDs, KII, and field observations.

Theme	Description	Illustrative Findings
1. Geographic Isolation & Agro-ecological Variation	Elevation and remoteness shape cropping systems and input access	Korphu: high-altitude subsistence maize, rice, buckwheat; Langthel: diverse cereals, fruits; Nubee: rugged terrain, limited wetland farming

2. Seasonal Scarcity & Water Limitations	Monsoon blockages and dry-season water shortages disrupt production	Korphu roads impassable in monsoon; Langthel off-season storage gaps; Nubee winter gardening hindered by lack of irrigation
3. Market Access & Infrastructure Gaps	Poor roads and distant markets increase costs and limit food variety	Korphu travels >1hr for groceries; Langthel benefits from weekly markets; Nubee expensive transport to Trongsa town
4. Livelihood Diversification & Income Distribution	Heavy dependence on few cash crops and remittances limits resilience	Korphu incomes from cardamom/oranges; Langthel from oranges, vegetables; Nubee from dairy and small sales
5. Nutrition Awareness & Dietary Practices	Basic knowledge exists but practices center on staple-based diets	Rice–curry thrice daily; wild foods seasonally; EBF challenged by labor demands
6. Gender & Care Responsibilities	Women’s dual burden affects feeding practices and food production	Women-headed households face food insecurity; early porridge introduction common
7. Institutional Support & Technology Needs	Requests for mechanization, storage, and extension services remain unmet	Community calls for greenhouses, irrigation, mechanization, nutrition-agriculture training

7.6 Recommendations based on thematic insights

To enhance food and nutrition security in Trongsa, the study recommends the following:

1. Improve Water Security:
 - Install rainwater harvesting systems and storage tanks
 - Construct gravity-fed irrigation channels in Nubee and Korphu
2. Enhance Road Connectivity & Markets:
 - Repair and maintain rural roads to reduce transport costs
 - Deploy mobile market units during monsoon blockages

3. Promote Nutrition-Sensitive Cropping:
 - Distribute drought-resistant, fast-maturing vegetable seeds
 - Provide IPM and soil fertility training via extension services
4. Support Women & Caregivers:
 - Establish childcare cooperatives to enable exclusive breastfeeding
 - Offer micro-credit and training for women-led home gardens and poultry groups
5. Expand Institutional Programs:
 - Mobilize LG-BRECSA to fulfill mechanization and greenhouse requests
 - Integrate agriculture-nutrition modules into BHU and school curricula
6. Build Post-Harvest Infrastructure:
 - Develop community-level cold storage and drying facilities
 - Train households in low-cost preservation methods
7. Community Monitoring & Feedback:
 - Implement participatory monitoring of food security indicators
 - Conduct quarterly chiwog-level learning workshops

8. Zhemgang Dzongkhag

8.1 Introduction

This section provides an overview of three gewogs: Bjoka, Shingkar, and Trong in Zhemgang Dzongkhag, capturing their geographic context, livelihoods, infrastructure status, and emerging development trends. These gewogs, situated across both Upper and Lower Kheng regions, reflect the diversity of agro-ecological conditions, accessibility, and socio-economic dynamics within the district.

Bjoka Gewog is one of the most remote gewogs in Zhemgang Dzongkhag, located in the Lower Kheng region. The Gewog centre is connected to Panbang, a satellite town in southern Zhemgang bordering Assam, via a 25-kilometre gewog centre road. Despite this road connection, transportation remains a major challenge, especially during the monsoon season, due to poor road conditions and frequent blockages.

Bjoka is renowned for its cane and bamboo handicrafts, which have been the primary source of livelihood for generations. In recent years, government interventions aimed at diversifying income sources have begun to yield results. The cultivation of cash crops such as cardamom and various fruits is increasing, and livestock activities, particularly poultry and dairy farming, are gradually improving.

Shingkar Gewog, located in the northernmost part of Zhemgang (Upper Kheng), is another remote gewog with limited accessibility. It is connected to the Dzongkhag headquarters in Trong Gewog by a 120-kilometre gewog centre road. Traditionally, Shingkar households have enjoyed relatively better living standards, with many being self-sufficient in food production. The gewog is often referred to as the “rice bowl” of Zhemgang due to its significant rice cultivation.

However, like other gewogs in the dzongkhag, Shingkar continues to face transportation challenges, particularly during the monsoon season when road conditions deteriorate, affecting the movement of people and goods.

Trong Gewog, also part of Upper Kheng, houses the Dzongkhag administrative headquarters. It is the northernmost gewog in the district and enjoys comparatively better road connectivity. Most chiwogs are linked via the Gelephu–Trongsa and Tingtibi–Panbang national highways.

The communities in Trong benefit from fertile agricultural land and cultivate a wide variety of crops. Oranges serve as the main cash crop, and cardamom cultivation has also seen a recent rise in popularity. With relatively reliable road infrastructure, Trong Gewog faces fewer transport-related barriers compared to other parts of the Dzongkhag.

8.2 Findings: Bjoka

A. Food Availability

Food availability in the gewog includes a range of traditional crops, vegetables, and fruits, with maize, rice, and buckwheat as staple crops, along with an array of vegetables like chillies, cabbage, and potatoes, and fruits including oranges and mangoes. While rice is the most frequently imported product from India, the community largely relies on local produce for their dietary needs. However, unpredictable weather patterns significantly affect food production, particularly during the summer months when crops like chillies suffer from heavy rainfall that impacts soil fertility.

The community's focus on cane and bamboo product production, driven by high demand, hinders food production diversification. Religious beliefs also limit the rearing of livestock, contributing to insufficient animal-source protein availability. Farmers face numerous challenges, including human-wildlife conflict, labour shortages, inadequate infrastructure (especially road and storage facilities), and a lack of access to markets, which prevent them from expanding fruit and vegetable production.

Seasonal variations further complicate food production, with droughts in winter and excessive rainfall in summer impacting crop yields.

Own food production

The following table shows the varieties of crops grown that are listed during the FGD. As can be seen some 13 varieties consisting of cereals, vegetables and fruits.

Table 72: Food Availability Calendar- Bjoka

S. No.	Name of the crops/ veg	Bhutanese Months											
		1	2	3	4	5	6	7	8	9	10	11	12
2	Potato												
3	Saag												
4	Beans												
5	Pumkin												
6	Cabbage												
7	Broccoli												
8	Radish												
9	Chilli												
10	Maize												
11	Mango												
12	Peach												
13	Ginger												
14	Plum												

	Planting
	Harvesting

As seen in the table, while as many as 14 varieties of crops are grown, paddy is not grown in Bjoka gewog.

Food shortages

The following table shows the crops and their shortages in the year as listed and discussed during the FGDs.

Table 73: Food Shortages Calendar-Bjoka

S. No.	Name of the crops	Bhutanese months											
1	Potato												
2	Saag												
3	Beans												
4	Pumpkin												
5	Cabbage												
6	Broccoli												
7	Radish												
8	Chilli												
9	Maize												
10	Mango												
11	Peach												
12	Ginger												
13	Plum												

As seen in the table above besides Saag (green leaf) most of the vegetables are not available throughout the year in spite of large varieties of crop grown due to seasonal productions and therefore availability.

B. Food accessibility

Access to food in the gewog has improved, but challenges still persist due to geographical barriers and poor infrastructure, especially in remote areas. While renovated vegetable markets and farm shops have enhanced access, difficult terrain and inadequate road maintenance hinder transportation. Rising prices of local products drive some residents to purchase food from India, particularly impacting small-scale farmers and remote villagers.

Most households cultivate their own vegetables and fruits, contributing to affordability, although vital staples like rice, oil, and salt are typically imported, adding to reliance on external markets. The mountainous terrain and insufficient machinery for farming reduce local farmers' market access, exacerbating food accessibility challenges, especially during the monsoon season when reaching markets becomes particularly difficult.

Purchase frequencies

The table below shows the items and frequencies of purchases to fulfill their food requirements as discussed during the FGDs. Majority of participants in the FGDs indicated that their purchases are monthly which are mostly imported items.

Table 74: Food Purchase Frequency- Bjoka

Sl. No.	Food items	Daily	weekly	Monthly	Every 3 months	Every 6 months	Once a year
1	Rice			15	1		
2	Oil		9	7			
3	Sugar		8	7	1		
4	Salt			14	2		
5	Milk Powder		3	9			
6	Cheese		2	9			
7	Meat		4	5			
8	Vegetables						

The above table shows that the participants can access varieties of food items in the community's due presence of grocery shops.

Distances to food source

The following table shows the distances to the grocery shops for the items that the FGDs participants purchase. Most of the items are within a walking distance of 30 minutes. However, they also travel by car to the grocery shops that are within 30 minutes.

Table 75: Distance to Food Source-Bjoka

Sl. No	Sources (shops) for purchase	Walking distances (minutes)				Distance by car (minutes)		
		15	30	60	60+	15	30	60
1	Rice	3	1				12	
2	Oil	4	2				10	
3	Cheese	1	2				12	
4	Sugar	10	2				2	
5	Salt	11	2				3	
6	Milk Powder	2	2				8	
7	Meat	1					13	
8	Vegetables	9	3				3	

The above table show that the physical distance to access food is not a challenge. Example Bjoka gewog has at least 1 grocery shop in each chiwog.

C. Food Affordability

Food affordability is a pressing issue in the community, largely driven by high poverty rates and income disparities. For instance, the price of locally harvested potatoes surged from Nu. 40 in 2024 to Nu. 100 in 2025, reflecting the rising cost of food. A significant proportion of households have incomes below the national average, which limits their ability to afford basic necessities, including food. Wealthier households spend only about 50% of their income on food, whereas poorer households allocate 50% to 80% of their income to food expenses.

The price of food tends to be higher early in the growing season, but it usually stabilizes or decreases as supply improves. Imported food prices are typically lower than local produce prices, though rising taxes and seasonal shortages have recently contributed to higher costs.

There are government subsidies aimed at ensuring food affordability, particularly through the provision of vegetable and livestock seeds, though many farmers in the gewog do not receive direct food subsidies.

Sources of income

The following table shows the sources of income of those who participated in the FGDs. As seen, the most important income source is Tsa-Zo (bamboo and cane handicrafts) both in terms of number of households and volume of income. This followed by ginger and oranges.

Table 76: Food Sources and Income Range-Bjoka

Sl. No	Income sources	Income range (Nu. in 000)										Total HHS
		10 -20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	Above 100	
1	Orange	4										4
2	Ginger	3			2		1					6
3	Tsa-Zo	3		2	4					6		15
4	Potato											0
5	Livestock	1										1

The above table indicate that each participant in the FGDs earned on an average a minimum of Nu. 15000/=.

D. Consumption patterns

Food consumption patterns in the community have remained largely unchanged, with no significant differences between the diets of the rich and the poor. The local population has a strong preference for staple foods such as rice, kharang (maize grits), spices like chili, and vegetables, while traditional preferences for crops like maize, buckwheat, and foxtail millet have diminished. A unique feature of local diets is a preference for bamboo shoots.

Households consume simple meals three times a day, often consisting of rice with seasonal vegetables and occasional legumes and pulses. As incomes increase, there is a tendency to

consume more meat, including pork, chicken, and beef. There is also strong presence of junk foods like noodles and fizzy drinks in the grocery shops in the gewog.

Seasonal changes affect food diversity, leading to a situation where locals sometimes only consume legumes or pulses once a day. Religious practices lead to abstaining from meat during auspicious days. There are efforts from farmers to enhance crop diversity through better access to resources and quality seed. Modern farming techniques are contributing positively to food availability.

Consumption frequency

The following table shows the consumption patterns as per the FGDs outcomes which reflects the normal pattern followed by majority of Bhutanese population.

Table 77: Frequency of Food Consumption-Bjoka

SL. No	Food Items	Frequencies			Remarks
		Daily	Once a week	Once a month	
	Cereals				
1	Rice	16			
2	Maize		8	1	
	Vegetables	16			
1	Potato		7		
2	Spinach (Saag)			11	
3	Broccoli			9	
	Fruits				
1	Orange				Seasonal
2	Peach				Seasonal

The above table show very limited diversity of food being consumed. However, the purchase items and frequencies show greater variety like meat and cheese.

Preparation methods

The following table demonstrates the food preparation methods that the FGD participants adopt. As usual, the main preparation method is boiling with some participants frying vegetables. Only fruits are consumed raw that also on seasonal basis.

Table 78:Preparation Methods-Bjoka

S. No	Food Items	Boil	Steam	Fry	Roast	Raw	Remarks
	Cereals						
1	Rice	16					
2	Maize	9					
	Vegetables	16					
1	Potato	7					
2	Spinach (Saag)			11			
3	Broccoli			9			
	Fruits						Seasonal
1	Orange					16	
2	Peach					16	

E. Nutrition awareness

The pregnant women and breastfeeding mothers are fully aware of the importance of proper nutrition for mother and child. Their visits to the health centres for their monthly check-up have ensure that they receive the health and nutrition awareness on regularly basis. Yet it is not known how the knowledge is practised.

While around 20-30% of people reportedly meet their nutritional needs, there is a general lack of awareness regarding nutritional deficiencies. Many farmers grow a variety of crops in one field, ensuring a fallback if one crop fails. Barriers to quality nutrition exist due to limited market access and reduced interest in livestock farming.

Health issues, such as diabetes linked to dietary imbalances, are emerging in the community, suggesting a growing need for improved dietary practices.

Although local farming is practiced, the reliance on handicraft industries has led to reduced cultivation of food crops, limiting dietary diversity

Challenges

The people are trying their best to sustain the supply chain throughout the year. Transport is a great issue with frequent roadblocks during the summer season, thereby the cost of transportation is skyrocketing for already poor people in the remotest corner of the societies. The frequent electricity blackout leads to storage problem.

8.3 Findings: Shingkhar gewog

A. Food Availability

Shingkhar Gewog has a diverse range of seasonal foods, including local produce such as avocados, oranges, various vegetables (e.g., cabbage, spinach, tomatoes), and staples like rice, maize, and buckwheat. While many food items are homegrown or locally available, the community faces seasonal variations in food supply, with certain products becoming scarce during off-seasons (from April to July). Although quality vegetables are cultivated using both traditional and modern techniques, the absence of proper farm roads and storage facilities hampers the ability to access and market these foods effectively. The local farming mix includes protein-rich crops and a variety of cereals, with occasional dependence on imported items for basic necessities, highlighting challenges in self-sufficiency.

Own food production

The following table shows the varieties of crops (cereals, vegetable and fruits) and their production seasons as discussed during the FGDs. As many as 14 varieties are listed some of which match with those of KIIs and some are additional.

Table 79: Food Availability Calendar-Shingkhar

S. No.	Name of crops	Bhutanese months											
		1	2	3	4	5	6	7	8	9	10	11	12
1	Maize												
2	Rice												
3	Buckwheat												
4	Wheat												
5	Avocado												
6	Orange												
7	Cabbage												
8	Chilli												
9	Potato												
10	Garlic												
11	Onion												
12	Beans												
13	Broccoli												
14	Ginger												

	Planting
	Harvesting

The above table indicate that potential to have good varieties of crops to meet nutrition requirement of the communities exist but need interventions to extend the availability through appropriate technologies and interventions.

Food shortages

The following table shows the food shortages as per the FGDs. As in any other gewog, Shingkar faces shortages of food items that they produce.

Table 80: Food Shortages Calendar- Shingkar

S. No.	Name of the c	Bhutanese months											
		1	2	3	4	5	6	7	8	9	10	11	12
1	Maize												
2	Rice												
3	Buckwheat												
4	Wheat												
5	Avocado												
6	Orange												
7	Cabbage												
8	Chilli												
9	Potato												
10	Garlic												
11	Onion												
12	Beans												
13	Broccoli												
14	Ginger												

B. Food Accessibility

Access to food is problematic due to the lack of markets and storage facilities within the gewog, impacting households' ability to procure fresh produce. Road blockages further complicate access to markets, and lower household incomes hinder affordability. While there exists a community support system to assist those in need, the isolation and economic challenges mean that many residents struggle to obtain sufficient food. Social events and traditional practices sometimes limit agricultural workdays, which can exacerbate food availability issues.

Purchase frequencies

The following table shows the types of food items and purchase frequencies and discussed during the FGDs. As seen, the number of items is comparably less than other gewogs. The purchase frequencies are also longer especially for rice, oil and salt with some households purchasing once in three months.

Table 81: Food Purchase Frequency-Shingkar

S. No.	Food items	Daily	weekly	Monthly	Every 3 months	Every 6 months	Once a year
1	Rice			15	3		
2	Oil			15	3		
3	Milk powder		3		11		
4	Sugar		18				
5	Salt			18			
6	Vegetables				15		
7	Meat			11			6

The above table indicate limited access to varieties of food items.

Distances to food source

The following table show the distances that the FGD participants have to travel to purchase their food items with majority travelling more one hour on foot and non via cars.

Table 82:Distance to Food Source-Shingkar

Sl. No	Sources (shops) for purchase	Walking distances (minutes)				Distances by car (minutes)		
		15	30	60	60+	15	30	60
1	Rice		5		10			
2	Oil		5		10			
3	Milk powder		5		10			
4	Sugar		5		10			
5	Salt		5		10			
6	Vegetables		5		10			
7	Meat		5		10			

The above table indicate that the physical access is essential food items is a challenge in Shingkar gewog for. A pointed under the introduction Shingkar gewog centre is 120 km from Zhemgang which is closest sources of imported food items.

C. Food Affordability

Food prices are rising, placing additional strain on low-income households, which often spend about 40-50% of their income on food. The costs of local products are notably high relative to household earnings, and without any effective food subsidy programs, affordability remains a pressing concern. The long distances to food stores amplify these challenges, making essential goods hard to buy.

Sources of income

The following table shows the income and sources of the participants of the FGD of Shingkhaw gewog. Majority of the participants do not have incomes sources. Of the sources, labour wage is most significant followed by cardamom and orange.

Table 83: Food Source and Income Range-Shingkhaw

Sl. No	Income sources	Income range (Nu. in 000)										Total HHs
		10-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-10	Above 100	
1	Vegetables	1										1
2	Orange		3									3
3	Labour wage		1	4	1							6
4	Cardamom	1	1		2							4
5	Retail shops			1		1						2

The results in the above table indicate lack of marketing opportunities due to long distances to market and high cost local products as found in the earlier sections.

D. Consumption Pattern

The dietary habits of Shingkhaw Gewog consist of rice and vegetable curries, consumed three times a day. Traditional foods such as buckwheat pancakes are losing popularity among younger generations. There is a shift toward modern cooking practices that incorporate more oils, diverging from healthier traditional methods. Despite the availability of nutritious vegetables, there is low consumption of legumes and pulses. Changes in food consumption are influenced by income improvements and social dynamics, leading to a gradual departure from traditional dietary habits.

Consumption frequency

The following table shows the consumption frequencies of various food items. As seen the diversity and frequencies do not vary like any other gewogs with boiled rice eaten with boil vegetables three times a day. Fruits like orange and plum consumed during the production seasons.

Table 84: Frequency of Food Consumption-Shingkar

SL. No	Food items	Daily	Once a week	Once a month	Remarks
	Cereals				
1	Maize		16		
2	Rice	17			
	Vegetables	17			
1	Broccolis		17		
2	Potato		17		
3	Saag		17		
	Fruits				Seasonal
1	Orange				
2	Plum				

Similar to other gewogs, the purchase shows a majority of the FGD participants consume meat once a month.

Preparation methods

The following table shows the common food preparation methods that the FGD identified during the discussion. As seen from the table, there is no differences in preparation methods adopted by other groups in other gewogs.

Table 85:Preparation Methods-Shingkar

S. No	Food items	Boil	Steam	Fry	Roast	Raw	Remarks
	Cereals						
1	Maize	17					
2	Rice	17					
	Vegetables						
1	Broccoli	14	1	2			
2	Potato	9		5			
3	Saag	1		15			
	Fruits						Seasonal
1	Orange					17	
2	Plum					17	

Nutrition Awareness

The monthly visits by the pregnant women and breastfeeding mothers to the health centres have successfully create awareness on the importance of balanced nutrition for good health of mother and child. They are required to visit health centres 8 times from conception till the child is 6 months old.

The community demonstrates a good understanding of the nutritional quality available from local farming, with an emphasis on the consumption of high-quality vegetables. There is increased reliance on modern cooking methods and less focus on traditional practices. There are no food or seed banks in the gewog, which limits the community's ability to preserve traditional food cultivation practices and enhance local nutrition.

Challenges

There is complete absence of supply chain due to remoteness and small population. The long distances, lack of storage facilities, market facilities and roadblocks in the summer months deter the supply chain actors to engage.

8.4 Findings: Trong gewog

A. Food Availability

The gewog offers a rich variety of food sources that include cereals primarily rice and maize, vegetables like pumpkins, squash, beans, cabbage, cauliflower, chilies, broccoli, spinach, and radish and fruits like oranges, mangoes, jackfruit, bananas, avocados, guavas, sugarcane, papayas, watermelons, and litchis.

Livestock products like chicken, eggs, pork, fish, cheese, butter, milk, and mutton are easily available.

Non-wood forest products (NWFP) such as ferns, mushrooms, bamboo shoots, yam, and cane shoots are available.

Agricultural practices are evolving from subsistence to more commercialized approaches, incorporating integrated farming and mixed cropping, supported by government initiatives like the MFTP (Market-Focused Trade Program). However, challenges include human-wildlife conflicts, poor market conditions, and limited capacity for processing and marketing, as well as issues with aging labour forces and general disinterest in agricultural roles.

Own food production

The following table shows the varieties of crops that consist of cereals, vegetables and fruits as found through the FGDs. The table indicates rich varieties are grown in the gewog.

Table 86: Food Availability Calendar- Trong

Sl. No.	Name of the crops/ veg	Bhutanese months											
		1	2	3	4	5	6	7	8	9	10	11	12
1	Rice			Harvesting						Planting	Planting		
2	Maize		Harvesting	Harvesting				Planting	Planting				
3	Mustard oil		Planting						Harvesting				
4	Wheat		Planting						Harvesting				
5	Buckwheat			Harvesting					Planting				
6	Millet		Harvesting			Planting							
7	Soya beans			Harvesting					Planting				
8	Cardamom		Harvesting						Planting				
9	Cocoyam		Planting								Harvesting		
10	Dal	Planting		Harvesting									
11	Orange	Planting	Harvesting						Planting				Planting
12	Ginger	Harvesting	Harvesting										
13	Kiwi		Harvesting						Planting	Planting			
14	Potato				Planting								Harvesting
15	Cabbage		Harvesting	Harvesting					Planting	Planting			
16	Broccoli			Harvesting					Planting	Planting			
17	Sagg	Harvesting		Planting	Planting	Planting	Planting	Planting	Planting	Planting	Planting	Planting	

	Planting
	Harvesting

Food shortages

The following table shows the shortages of food items as discussed and identified during the FGDs.

Table 87: Food Shortages Calendar- Trong

S. No.	Name of the crops	Bhutanese months											
		1	2	3	4	5	6	7	8	9	10	11	12
1	Rice												
2	Maize												
3	Mustard oil												
4	Wheat												
5	Buckwheat												
6	Millet												
7	Soya beans												
8	Cardamom												
9	Cocoyam												
10	Dal												
11	Orange												
12	Ginger												
13	Kiwi												
14	Potato												
15	Cabbage												
16	Broccoli												
17	Sagg												

As in all the gewogs, Trong gewog too faces seasonal shortages of food items they grow due to climate variations.

B. Food Accessibility

Access to food in the gewog is relatively high due to its favourable location along the national highway and the presence of several grocery shops, making food readily available and affordable compared to other areas. The absence of transportation fees and market linkages further enhances accessibility, allowing residents to obtain groceries without difficulty.

Purchase frequencies

The following table shows the essential food items and frequencies of purchase as discussed during the FGD. While majority of FGD participants purchase monthly, the frequencies of purchases vary from daily to every six months.

Table 88: Food Purchase Frequency-Trong

S. No.	Food items	Daily	Weekly	Monthly	Every 3 months	Every 6 months	Once a year
1	Rice		1	8	4	1	
2	Salt		3	9	3	1	
3	Sugar		9	4	2	1	
4	Milk Powder		3	7	3	1	
5	Oil		1	8	3	1	
6	Vegetables		2	2	2		1
7	Meat	2	2	3	5	1	
8	Tea Leave			9	4	2	

The result of the table above indicate ease in physical access to the food items.

Distances to food source

The following table shows that only small number of households that participated in the FGDs from the nearby grocery shops. Majority of the participants prefer to travel by cars to purchase their food items. The travel distances by car are mostly within 30 minutes.

Table 89: Distance to Food Source-Trong

Sl. No	Sources (shops) for purchase	Walking distances (minutes)				Distance by car (minutes)		
		15	30	60	60+	15	30	60
1	Rice					5	9	
2	Salt	3				5	8	1
3	Sugar	3				3	7	
4	Milk powder					5	10	
5	Oil					5	9	
6	Vegetables					1	7	
7	Meat					0	11	1
8	Tea leave	1				5	8	

The results in the above table indicate most of the participants are connected to reliable road access and therefore they can purchase their food items whenever they want. It also indicate that the stocks in the grocery shops are reliable.

c. Food Affordability

Despite good accessibility, rising food prices due to inflation are a concern, making essential items more expensive. Households are spending a significant portion of their income on food, with no existing subsidies to help mitigate costs. Implementing programs for food subsidies,

transportation assistance, and seed supply could greatly improve affordability in the initial stages.

Sources of income

The following table shows the sources and income of those households who participated in the FGDs. For majority of the households, income comes from the sale of oranges followed by cardamom and avocados.

Table 90: Food Sources and Income Range-Trong

Sl. No	Income sources	Income range (Nu. in 000)										Total HHS
		10-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	Above 100	
1	Cardamom	6	2	1								9
2	Orange	4	2	1	1	1		1	1	1		12
3	Avocado	2		3								5
4	Vegetables	1	1									2
5	Butter & che	4										4

The result presented in the above table indicate that fruits and cardamom are viable income sources. This may be attributed to reliable road connectivity to the distant market.

D. Consumption Pattern

Dietary habits in the gewog typically consist of rice and vegetables consumed three times daily, with some households also including fruits. There is a lack of traditional food practices, although vulnerable populations maintain similar dietary patterns amidst changing economic conditions. Junk foods like noodles and processed foods are making inroads to the changing food habits. Fizzy drinks are easily available.

Consumption frequency

The following table shows the food items and consumption frequencies as discussed during the FGDs. Similar to other findings, the consumption patterns consist of rice with vegetables three times. Similarly, fruits like orange and kiwi are consumed during the season.

Table 91: Frequency of Food Consumption -Trong

SL. No	Food Items	Daily	Once a week	Once a month	Remarks
	Cereals				
1	Rice	17			
2	Maize		3	11	
3	wheat			11	
	Vegetables	17			
1	Spinach (Saag)		11	7	
2	Broccoli		8	9	
3	cabbage		8	9	
	Fruits				Seasonal
1	Orange				
2	Kiwi				

In terms of dietary diversity, meat is on the list of monthly purchase list indicating monthly consumption of meat.

Preparation methods

The following table shows the preparation methods of food items as discussed in the FGDs. While boiling of both the cereals and vegetables, there is a slight variation in preparation methods compared to other two gewogs that part of the same assessment. Steaming and frying are used to prepare the vegetables.

Table 92: Preparation Methods-Trong

S. No	Food Items	Boil	Steam	Fry	Roast	Raw	Remarks
	Cereals	11					
1	Rice	11			3		
2	Maize	11					
3	Wheat						
	Vegetables						
1	Spinach (Saag)	13			5		
2	Broccoli	9	9	8			
3	Cabbage	5	7	5			
	Fruits						Seasonal
1	Orange					16	
2	Kiwi					16	

Nutrition Awareness

Nutrition awareness is high among pregnant and breastfeeding women, largely due to guidance from health professionals during health centre visits. The quality of nutrition is regarded as high, with an emphasis on organic farming and diversified crop production. Farmers are increasingly turning to integrated farming practices and are encouraged to plant

high-value fruit trees, supported by improved storage facilities for mass production with cold storage capabilities.

Issues and Challenges

- Road condition for travelling and agriculture activities are challenging due to underdeveloped road infrastructures especially in the remote gewogs of Shingkhar in the Upper Kheng and Bjoka in Lower Kheng.
- Wildlife damages to crops and livestock are leading to losing hopes for agriculture activities.
- Drying of water sources due to climate changes lead water shortages for both drinking and crop production.
- Limited demand for local products and reliable local market demotivate the communities to produce beyond their family needs.
- Land quality like sloppy terrain, poor soils and soil depths and stone is not favourable for usage of machines and modern technology.
- Seeds shortages in terms availability of quality and timeliness limits the reaping of full production potential of land and labour.

8.5 Thematic Analysis of Qualitative Behaviour Research in Zhemgang District

The qualitative behavioural research conducted in Bjoka, Shingkhar, and Trong Gewogs of Zhemgang Dzongkhag revealed key themes influencing food production, accessibility, livelihood patterns, and nutritional practices. The themes reflect both regional variation between the Upper and Lower Kheng that shared structural and socio-economic challenges across gewogs.

Theme	Description	Illustrative Findings
1. Livelihood Diversification & Traditional Crafts	Role of handicrafts alongside agriculture shapes income streams	Bjoka: cane/bamboo handicrafts as primary income; Shingkhar: rice bowl yet limited market; Trong: commercial oranges & mixed farming
2. Geographic Isolation & Infrastructure Constraints	Remote terrain & poor roads impede market access and supply chains	Bjoka to Panbang: 25 km of underdeveloped road; Shingkhar > 120 km to HQ; Trong benefits from national highways
3. Seasonal Variability & Climate Impacts	Monsoon blockages, drought, and wildlife conflict disrupt production	Bjoka: heavy rains harm chilli; Shingkhar: off-season shortages; Trong: elephant and boar crop losses

4. Food Availability & Diversity	Reliance on subsistence staples with gaps in year-round diversity	14–18 crop varieties grown; paddy absent in Bjoka; wild foods seasonal; limited livestock protein
5. Market Access & Affordability	High transport costs & imported staples shape purchasing behaviours	Monthly imported rice/oil; grocery shop in each chiwog (Bjoka); Trong low transport barriers
6. Nutrition Awareness & Dietary Practices	Basic nutrition knowledge from health centers but staple-centric diets persist	Rice–curry thrice daily; meat/eggs monthly; EBF supported but constrained by early work return
7. Institutional Support & Technology Needs	Demand for mechanization, storage, and integrated extension remains unmet	Calls for road upgrades, cold storage units, seed supply, agriculture–nutrition linkages

8.6 Recommendations from thematic insights

To enhance food and nutrition security in Zhemgang, the study recommends the following:

- Improve Infrastructure by upgrading rural roads and maintaining key highways to ensure year-round access.
- Diversify Livelihoods through support for handicraft–tourism linkages and value-addition training for cash crops.
- Strengthen Water and Climate Resilience with rainwater harvesting, micro-dams, and crop insurance.
- Promote Nutrition-Sensitive Farming by distributing fast-maturing vegetable seeds and encouraging integrated poultry–home garden models.
- Enhance Market and Storage Access via cold storage facilities and mobile markets during monsoon.
- Improve Nutrition Education through local cooking demos and BCC materials in local languages.
- Foster Institutional Collaboration to deliver timely inputs and integrate agriculture–nutrition messages into health and school systems.

9. Discussion: Cross-District Insights and Implications

The cross-district thematic synthesis reveals a set of recurring challenges and opportunities that cut across the four study districts. Despite diverse agro-ecological zones and livelihood systems, communities consistently face seasonal water shortages, limited market access due to poor infrastructure, and vulnerability to climate-related and wildlife-induced crop losses. While there is growing awareness of nutrition and dietary diversity, actual practices remain constrained by workload, gendered care responsibilities, and limited resources. Women's dual roles in farming and caregiving continue to impact household food security and infant feeding. Meanwhile, rural livelihoods remain dependent on a narrow range of crops and crafts, with limited value addition. Across all districts, there is strong demand for improved institutional support particularly in areas of irrigation, mechanization, storage, and integrated agriculture–nutrition set services. These findings underscore the need for holistic, multi-sectoral strategies to strengthen food and nutrition security in Bhutan's rural communities.

10. Conclusion

This qualitative behaviour study across Sarpang, Tsirang, Trongsa and Zhemgang districts reveals a consistent interplay between agro-ecological context, market access, livelihood diversification and nutritional outcomes. Elevation and seasonal climate cycles strongly dictate cropping calendars and lean-season food gaps, while monsoon-prone roads and long distances to markets amplify both price volatility and supply disruptions. Households uniformly rely on a narrow basket of staples (rice, maize) supplemented by cash crops (cardamom, oranges) or traditional handicrafts (cane/bamboo in Bjoka), leaving dietary diversity and particularly intake of animal-source proteins which is limited to occasional lean-season or income driven purchases.

Despite basic nutrition awareness, largely mediated through local BHUs and maternal health visits, the dietary practices remain staple-centric, with rice–curry consumed three times daily and fruits, meats or eggs appearing only monthly. Women shoulder the dual burden of production and caregiving, constraining exclusive breastfeeding and their own nutritional status. Across all districts, stakeholders voiced unmet needs for water harvesting, irrigation infrastructure, mechanization, post-harvest storage and integrated agriculture-nutrition extension.

Collectively, these findings underscore the need for multi-sectoral interventions that marry climate-resilient, nutrition-sensitive farming practices with gender-responsive social support and strengthened market linkages.

11. Limitations

While the study offers rich qualitative insights, it is not without limitations. Data were drawn from a purposive sample of selected chiwogs and participants, which may not fully capture the diversity of experiences within each district. Seasonal timing and weather conditions also limited access to some remote areas, potentially affecting the representativeness of voices included. In some cases, language or translation nuances may have influenced the depth of responses during focus group discussions.

Additionally, the qualitative nature of the study means findings are context-specific and not statistically generalizable. However, the depth of inquiry and triangulation across multiple data sources provide a strong foundation for interpreting local realities and informing contextually relevant interventions.

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Annex. 1.: Key Informant Interviews and Focus Group Discussion Guide

Overview - Nutrition awareness

- Awareness on importance of nutrition
- Knowledge on Balanced diet/diverse diet - What knowledge do women have about the importance of balanced diets, especially with locally available food options?
- Sources of good nutrition - How informed are women about the nutritional value of the food options available at local markets?
- Are there specific misconceptions or gaps in knowledge regarding the nutritional quality of foods commonly purchased?

Section 1: Food Availability

1. General Availability

- How would you describe the availability of food in your community? What foods (crops, livestock products, fruits, wild foods) are easily available and what are not?
- What are the main sources of food for your households (e.g., local markets, farms, home gardens, shops, imports)?

What is the role of women in food production in the district?

2. Seasonal Variations

- Do you notice any changes in food availability during different seasons (Prompt on specific food considered important)? Which seasons are most challenging?

3. Supply Chain

- How reliable is the food supply in your area?
- What challenges do you face in getting food (e.g., transportation issues, storage problems)?

Section 2: Food Accessibility

1. Physical Accessibility

- How easy is it for you to access food markets or stores?
- Are there any physical barriers that make it difficult to get food (e.g., distance, lack of transportation)?

2. Economic Accessibility

- How affordable is food for your family?
- Are there any specific groups in your community that struggle more with accessing food?

3. Social Accessibility

- Are there any social or cultural factors that affect your ability to access food?
- How do community support systems (e.g., food banks, social programs) help you access food?

Section 3: Food Affordability

1. Price Trends

- What are the current trends in food prices in your community?
- Have you noticed any significant changes in food prices recently?
- To what extent is the cost of food a barrier to buying enough food for your household?

- What demographic groups are most vulnerable to these price changes, and how do these changes impact their access to nutritious foods?

2. Income and Expenditure

- How does your household income compare to the cost of food?
- What are the main sources of your household?
- What proportion of your household income is typically spent on food? What determines what amount goes towards food

3. Subsidies and Assistance

- Are there any programs that provide food subsidies or assistance in your community?
- How effective are these programs in helping you afford food?

Section 4: Consumption Patterns

1. Dietary Habits

- What are the food preferences in your households?

Describe the common dietary habits in your households (E.g. skipping breakfast, junk foods etc).

What are the culinary practices in the district? What preservation techniques are used?

- Are there any traditional foods that are particularly important to you?

2. Nutritional Quality

- How would you assess the nutritional quality of your diet?
- Are there any nutritional deficiencies or health issues related to diet that you are aware of?
- How do local farming practices impact crop diversity and food security in the district?
- How frequently do households include legumes and pulses in their daily diet/menu?

3. Changes in Consumption

- Have there been any recent changes in your food consumption patterns?
- What factors are driving these changes (e.g., economic conditions, cultural shifts)?

4. Breastfeeding - is there a specific diet consumed by pregnant and breastfeeding women? If so, please list the special foods. Is it accessible, affordable?

Assessment of food availability: Food shortages calendar

- Prepare a chart in advance of the assessment as follows

Sl. No	Food Items	BHUTANESE MONTHS									
		1	2	3	4	5	6	7	8	9	10

- Distribute 12 small objects (maize grains/beans/pebbles) to each participant
- Ask the participants to place the given objects on the Bhutanese months during which their own production is not enough and have to purchase.
- Count the number of objects under month and record in your note keeping books.
- Ask the participants how many (%) of their village folks have to purchase food similar to that on the chart and take note.
- Ask the participants how do cope during the food shortages

Assessment of food accessibility: Food purchases and sources

- Prepare a chart in advance of the assessment as follows

Sl. No	Food items	Daily	Weekly	Monthly	Every 3 months	Every 6 months	Once in a year
1							
2							
3							
4							
6							
7							
8							
9							
10							
11							
12							

- Ask the participants the food items that they purchase a list them down in the above chart
- Distribute 6 small objects (maize grains/beans/pebbles) to each participant
- Ask the participants to place the given objects on the frequencies of purchases.
- Count the number of objects under the frequencies and record in your note keeping books.

- Ask the participants how many (%) of their village folks have to make similar purchases to that on the chart and take note.
- Ask the participants from where they purchase the food items listed above and distance to those locations (km/hour) and prepare a list and number of participants reporting them
- Ask the participants their sources of income for the purchases. List the number of participants with similar income sources together and ask the ranges (maximum, minimum and average) on income.
- Ask the participants % of households in their villages with similar income ranges and note them.

Food accessibility: Distances to food sources

Prepare a chart in advance of the assessment as follows

Sl. No	Sources for purchase (Shops)	Walking distances (Minutes)				Distances by car (Minutes)			
		1-5	3-0	6-0	6-0+	1-5	3-0	6-0	6-0+
1									
2									
3									
4									
6									
7									

Assessment of food affordability: Income and income sources

Prepare a chart in advance of the assessment as follows

Sl. No	Income sources	Income range (Nu. 000)							
		10-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90
1									
2									
3									
4									
5									
6									
7									
8									

Assessment of food consumption: Food varieties, frequencies and preparation

- Prepare a chart in advance of the assessment as follows

	Food items	Daily	Once in a week	Once a month		Boil	Steam	Fry
	Cereals							
	Vegetables							
	Fruits							

- Ask the participants the common food that they eat and a list them down in the above chart
- Distribute 8 small objects (maize grains/beans/pebbles) to each participant
- Ask the participants to place the given objects on the frequencies of food consumed.
- Count the number of objects under the frequencies and record in your note keeping books.
- Once again ask the participants to place the given objects on the food preparation methods that they use.
- Ask the participants how many (%) of their village folks eat and prepare similar food items and take note.