Food Environments in Tea Estates

How the Malaiyaha Community in Deniyaya (Sri Lanka) interacts with their food environment.

Introduction

Fruit and Vegetables for Sustainable Healthy Diets (FRESH) is a CGIAR multi-partner research initiative*. The aim of this initiative is to improve diet quality, nutrition and health while also improving livelihoods, empowering women and youth and mitigating negative environmental impacts.

As part of FRESH, the Institute of Development Studies in the UK, Voice of the Plantation People Organisation and Colombo Urban Lab sought to understand how communities in two areas of Sri Lanka's Southern Province, close to the Deniyaya town experience their food environment. This is the second phase of an identical study conducted in Colombo. We took an integrated approach of mapping food vendors, conducting semi-structured interviews with households and vendors across the two sites, stakeholder consultations, and participatory photography workshops using the photovoice methodology. This involved community members taking pictures of their food environment and collectively discussing these. The research then combined continuous face to face interviews and discussions with stakeholders and community members over a period of four months (February 2024 - June 2024). Further information can be found through our protocol and photovoice user guide.

This information has been brought together into this StoryMap to illustrate the daily lived experiences of communities and vendors and how this shapes what people have access to, how they make decisions around food, and ultimately what they consume. All the photos in this StoryMap were taken by the community members who participated in the photovoice workshops. The stories of community needs and priorities will be presented to policymakers with the intention to design grounded interventions to make fresh fruits and vegetables more accessible to all.

>>CASE STUDY 1

Mallika* is 70 years old and lives with her 75 year old husband. Mallika is recovering from tuberculosis and has bad eczema, while her husband has diabetes. They both

travel frequently to the medical clinic in the Deniyaya hospital (located 8 km away) to treat diabetes and tuberculosis. Mallika also visits a doctor in Pallegama (located 15 km away) once every three months for her eczema.

Their monthly household income is about LKR 22, 500 a month. Her husband works at a private tea plantation as a labourer where he plucks tea leaves and does the cleaning work. He earns LKR 1,200-1,500 a day, although he finds it difficult to work every day due to his medical condition. Apart from this, Mallika receives LKR 7,500 from Aswesuma (a national cash transfer/ social security), and occasionally receives about LKR 3,000 from their second son and their daughter.

Food is their largest item of expenditure, followed by medicine and then electricity. Mallika says that the price of food, milk powder and medicine have sharply increased in the past few years making *"it is very difficult to manage as earlier because the cost of the food and medicine has doubled"*. They use the rice cooker and wood stove to prepare their meals. She said firewood helps to reduce costs compared to using gas or electricity, the prices of which have been increasing significantly since 2022.

For breakfast, she cooks rice and *sambol* which they also have for lunch with some papadams or dry fish. For dinner they cook a meal consisting generally of rice, dhal and fried dry fish, and once a week they prepare chicken curry. Before the economic crisis, they had vegetables, eggs, and fish in their meals once or twice a week. However, speaking about the present situation, Mallika said that *"it is not possible to do so"*.

>>CASE STUDY 2

Nandani is 40 years old and lives in a household with six other people (her husband, parents, two children and uncle). Only Nandani and her husband earn an income. Her husband works at a tyre shop as a labourer, and Nandani works the night shift at the tea factory as a worker. Collectively they earn around LKR 35,000 a month.

Nandani's elderly parents have a number of health issues. Her mother has diabetes, high blood pressure, and heart disease and her father has high blood pressure. Each month they visit the Deniyaya hospital, however, it does not provide them with all of the medicine free of charge, and they have to purchase the rest.

Their highest monthly expenditure is food, followed by loan repayments. Transport and utilities are also significant areas of expenditure for them. Nandani has to pawn her jewellery sometimes in order to cover their monthly expenses.

Both Nandani's children go to school, and receive a mid-day meal from the school consisting of rice, dhal and either egg or fish. They also take a homemade meal to school everyday. Whilst the school monitors the nutrition of the meals brought by children to school, Nandani says that the school also takes into consideration the capacities of the parents as well, so she has not received any complaints about what her children bring to school.

Nandani prepares two meals a day (breakfast and lunch) for the household of seven people, and takes about one hour to prepare each meal. Nandani uses a wood stove for her cooking because they can no longer afford to purchase the liquid petroleum gas for a gas stove which she used prior to the economic crisis.

For breakfast, she usually prepares a dhal curry, sambol, or thosai. For lunch she would prepare rice with two curries, a leafy green and sometimes dry fish. Speaking about the current situation, she said,

"[we] very rarely have leftovers because we prepare our meals based on what is available, which ensures that waste is minimal. Given the rising prices of vegetables and rice, we are particularly mindful of avoiding wastage".

Location in Deniyaya

Two sites were selected in the Southern Province of Sri Lanka, close to the Deniyaya town. The sites are located in two divisions of the Deniyaya tea estate, which are nested within two Grama Niladhari Divisions (a Grama Niladhari division or a GN division is the smallest administrative unit in Sri Lanka) (See figure 1). These divisions are

- Diyadawa division: located within the Kotapola GN division
- Lower division: located within the Thenipita GN division

The majority ethnic group within the community comprises the Malaiyaha Tamil ethnic group. According to the census conducted in 2012 by The Department of Census and Statistics, Sri Lanka, the Malaiyaha Tamil community represented a little over 4% of Sri Lanka's population.

The Malaiyaha Tamil people were brought to Sri Lanka in the 1800s by the British colonial administration to work in the tea and rubber estates. Following independence, the enactment of the Ceylon Citizenship Act of 1948 disenfranchised this community, making them stateless. This continued until the 1980s, when finally the government extended public services to them. However, it was only in 2003 that the Malaiyaha community was granted citizenship through the Grant of Citizenship to Persons of Indian Origin Act 2003. Even then, it wouldn't be till 2007 when members of the Malaiyaha community who had sought refuge in Tamil Nadu were able to become citizens of Sri Lanka. Despite this, formal rights available to claim by the community are to this day often denied in practice.

Furthermore, apart from experiencing statelessness as a community, they have also experienced other forms of structural and direct forms of violence. These include the rise in homelessness and unemployment within the community following the land reforms in 1972; the violence experienced by Sinhalese mobs and the Sri Lankan army in the early 80s; and the vulnerability experienced when ethnic tensions violently flared up—especially during the war.

The association with Sri Lanka's tea sector and ancestry that extends from South India has led to the community to be collectively referred to as Estate Tamils, Plantation Tamils, Tamils of Indian Origin, Up-Country Tamils, Hill Country Tamils etc.. This StoryMap chooses to use the names Malaiyaha Tamil community, Malaiyaha Tamil people or the Malaiyaha community*.

Vendor, Fresh Fruit, and Vegetable Diversity

As part of our methodology, we mapped vendors selling food products along the main road between Kotapola and Deniyaya town, including vendors at the Sunday market. A total of 153 vendors were recorded, out of which groceries and cooked foods were the most common types of goods sold respectively. 66 shops or 43% of vendors sold fresh fruit and/or vegetables (marked as red in the map). However, 19 out of 66 vendors selling fresh fruits and vegetables were those who sold only once a week at the Sunday market.

Food environment themes

The Malaiyaha community's precarity

The Malaiyaha community is one of the most marginalised groups in the country, owing to years of structural inequality. One such factor is the lack of land rights and right to cultivation. Whilst the Malaiyaha communities have been given land to stay, they have no rights to the land. Currently, families can't build or improve their homes freely nor are they allowed to grow their own vegetables and fruit as they do not have rights to the land. This is strongly monitored and enforced by the estate management which makes it difficult for families to grow any food, though they may have the land to do so.

Yet another factor that contributes to their precarity is the ongoing ethnic tension with the majority Sinhala community. A sense of vulnerability due to ethnic tensions was a sentiment which was echoed by the families, where they pointed out that even though the relationship with the neighbouring Sinhala community is amicable, they still feel that when faced with issues that cut along ethnic lines, the neighbouring Sinhala community will focus on their self-interests. They also noted the double standards of the estate management when addressing occupancy within lands under its purview. For instance, they reported that when Sinhala families occupy a house built by an estate and decide to upgrade their home, the estate management would not complain. However, in the case of the Malaiyaha community, they would need to seek permission from the estate in order to change a sheet on their roof.

Their employment too, adds to their precarity. The types of occupations people from the Malaiyaha community are engaged in are quite diverse. Many work outside of the tea sector in occupations ranging from a hindu priest, to state officers, to salon and restaurant operators, working in other private tea estates and finding employment abroad to remit part of their income back home.

Certain households may have several streams of income. Households which collectively earned more than LKR 100,000 per month had one member of the family working abroad remitting part of their salary, while the second and third highest earning households had to supplement the remitted salary with another consistent source of income. The lowest income recorded was from a household where the son earns an inconsistent income selling scrap iron for the household comprising three adults and one child of five years. The household said that they might need to skip meals when there is no income.

Most of the households with elderly people who are living alone were particularly vulnerable, for they are among the lowest income earning households (earning between LKR 9,500, - LKR 30,000 a month). However, all these households received a monthly cash transfer of LKR 7,500 - 8,500 from Aswesuma, Sri Lanka's new social security cash transfer programme.

People can work for the Deniyaya tea estate in two different ways. Firstly, they may work directly as workers at the estate. Secondly, they may take part in the bought leaf programme which is also known as the outgrowing model. The bought leaf programme involves the estate providing land to the community along with fertiliser. However, they do not have rights to the land, and are expected to tend to the plantations and sell the tea leaves back to the plantation company. Whilst the model offers more flexibility, workers are faced with increased precarity as this model does not include contributions to the Employees Provident Fund and Employees Trust Fund, which are social security schemes for employees. Workers at private estates and those working in the bought leaf programme also complain about their income being dependent on the weather.

A respondent described this model as follows:

"The estate will provide 1 -1.5 acres from the estate's lands along with fertiliser under a credit margin. This land is not owned by us, however, we have to fertilise the tea plants and attend to the weeding. After we pluck the tea leaves, we have to sell it to the factory. They buy the tea leaves and give us LKR 100 per 1 kg. However, they deduct the fertiliser fee from this money. No deductions for the Employees' Provident Fund and the Employees' Trust Fund." - Respondent from Kotapola

Families noted that food related expenses were the highest expense of households. When asked about how expenses have increased over the past three years, families noted that income does not match household expenditure. In order to optimise cash flow, almost all families either take part in rotating savings and credit associations (ROSCAs), or take loans either from family, neighbours, loan sharks, or formal financial institutions.

Food prices and purchasing on credit

Price plays an important role in determining what foods families choose to buy and consume. Sri Lanka's ongoing economic crisis since 2022 has influenced these decisions causing these families to follow certain strategies in order to cope with the increased cost of living.

Owing to the increase in food prices, a general sentiment among the community was that they have reduced the consumption of fresh produce. Families noted that vegetables such as leafy greens, okra and long beans were bought particularly because they were cheaper. In addition to buying items that were cheaper, families are also foregoing items such as fruit, that they were able to consume previously, but are unable to now—due to increased costs.

"I can't afford to buy vegetables anymore because the price has increased" -Respondent from Thenipita

Despite having shops closer to their home, they noted that the goods in these shops are more expensive and that vendors do not offer food on credit, unlike the vendors in the Deniyaya town (which is 6 KM from Thenipita, and 12 KM from Kotapola) who would offer credit. Most people preferred shopping in the town as opposed to the public market (which is 18 KM from Thenipita and 13 KM from Kotapola) because they did not observe a major difference in the cost, and because the convenience of shopping in Deniyaya town, as the public market is only open on Sundays, unlike the other shops in town which are open on most days.

Owing to the high price of fresh produce, families noted cutting back on other areas of expenditure. One family described how they had to walk all the way back from the town with the vegetables, because *"the cost of the vegetables was too much",* and they did not have enough money to pay for the transport back home.

Vendors have had to adapt to a change in consumer demand over time, by changing what produce they choose to sell. They are now choosing to stock items that are lower in price but also stocking smaller quantities of produce, owing to the limited purchasing power of their customers. Additionally, vendors have moved away from stocking items such as fruit which they no longer have demand for and look to stock items that have a longer shelf life and more demand. They also noted adjusting their selling times based on when they have customers. Vendors in the Deniyaya town are more likely to operate from morning until around 6:00 PM each evening as there are no buses in the town after that time, and therefore no customers.

"Because of the economic crisis, food patterns have changed a little bit by customers - they are reducing the goods bought, so we have to reduce the stock (of produce sold in the shop)." - Vendor, Deniyaya Town

"We cannot store more fruits because the customer base is not stable. This is because the price of the fruit (has increased) and we have to reduce the wastage." - Vendor, Deniyaya Town

Coping strategies

In order to cope with the rising cost of fresh produce - families are resorting to a host of strategies - one of which is increasing the consumption of dhal and textured vegetable protein (TVP) or 'soya' as it is referred to. The latter was described by families to be a substitute for meat and fish, is easy to prepare and 'is pleasing to the eyes' even though it is expensive. Families also noted changing recipes to include a small amount of vegetables into a dhal curry to increase the volume.
"In the past we would eat all types of food. However, that has changed and reduced now – we can no longer afford vegetables. We have reduced the quantity of vegetables, and now we mainly eat dhal and soya". - Respondent, Thenipita

"For the amount we spend on vegetables, we can buy a kilo of dhal which would last us about a week" - Respondent, Kotapola

[Photovoice]

[Photovoice]

Reducing the diversity of their diet was another observed response to the rising cost of living. Although rotis, string hoppers, thosai, noodles, chickpeas and mung beans were mentioned as staple foods which are consumed by the community, rice and curry was the most consumed type of meal. This is due to other staples and take-out food being unaffordable. A household member noted, *"If we could eat something else and save the rice we would, but now we eat rice for all three meals"*.

"Now vegetables and other household item's prices have gone up, but our income is the same for the last three years so we reduced the food consumption and entertainment etc." - Respondent from Kotapola

Skipping meals or satiating hunger with processed foods was another strategy used in order to cope with scarcity. One person mentioned that in order to put food on the table at all, people may skip every other meal ("we eat one meal and skip the next and wait in hunger"). Another family noted that they would often eat biscuits or Samaposha (a brand of processed cereal) in the morning as a substitute for breakfast. The choice of biscuit consumed is determined by price. Marie biscuits were preferred because the smallest pack can be bought for LKR 50.00.

Households also spoke of how biscuits and tea can be eaten as a meal when they cannot find anything else to eat. Sometimes, during such situations, only the children of a family would eat biscuits while the adults skip the meal. In these situations families further explained how they would specially consider the hunger of their children as follows:

"If we do not have any food, we will give (plain, unsweetened) tea and biscuits and satisfy their (children's) hunger" - Respondent from Thenipita

"When the children are crying (from hunger), we will give them biscuits and pacify them" - Respondent from Thenipita

"I did not have anything at home [to cook] therefore she ate some biscuits and drank some tea and then took my medicine" - Respondent from Thotapola

I

[Photovoice]

Some households would prepare one meal which would be consumed multiple times in the day, rather than cooking from scratch each time. They also noted mixing two types of vegetable or lentils together to make a single curry, which would be cheaper and less time consuming. Families also noted using leftover food such as rice or chickpeas to make other food items, while other families used often discarded parts of produce or the heads of fish to prepare alternative condiments.

" [we] very rarely have leftovers because we prepare our meals based on what is available, which ensures that waste is minimal. Given the rising prices of vegetables and rice, we are particularly mindful of avoiding wastage" - Respondent from Thenipita

[Photovoice]

Care networks

Care networks play a key role in the food environment of the community. Older adults living alone were observed to be particularly vulnerable to food insecurity as they do not have reliable income streams, or have a very low income. As a result, they are more likely to not consume three meals a day, skip breakfast or have a later breakfast and skip lunch. They often rely on the help of neighbours or family members who provide some food, although this is increasingly challenging, as all in the community are faced with the increased cost of living. Whilst the elderly in the community received a monthly stipend from the state fund for elders, the amounts received appear to range from LKR 300 - 2,000 a month which is not enough to sustain them.

[Photovoice]

The logic of care within a gift economy was also articulated by some who described how caregivers often put the needs of the care receivers in front of their own. A household member described the practice of providing a meal to expecting mothers as follows:

"Even though we have financial hardships, cooking for someone else is a good practice… we provide before it is asked." - Respondent from Kotapola

Another similar sentiment was articulated by another household who explained how sharing meals with expecting mothers is a norm which is practised by the community. "Regardless of difficulties we may face, we will always look to provide a meal for an expecting mother".

Rani and her husband are an elderly couple in their seventies who used to receive an income from both her children. However they had a falling out with their son over the rights to the house they are living in. Now they are solely dependent on their daughter's support. However, the social ties between her household and her neighbours have developed into a care network which she and her husband can rely on. Her neighbours also reminisced about how Rani's house was a place where they

have all eaten at, which not only describes how Rani's socioeconomic situation was less vulnerable in the past, but also provides a glimpse into how the social ties were cultivated through food.

Sharing food such as jackfruit grown in their garden with neighbours was another practice which people talked about. A household noted that they have jack tree in their garden and do not eat young jackfruit ('polos') from the tree because if they pluck the fruit at that stage, it will only be enough for one household, whereas if they allow it to ripen further into a jackfruit, the yield will be enough to share with others. The importance of such considerations was articulated by those who cannot afford the rising cost of vegetables—*"when we inquire about the price of vegetables, we feel that it is better to eat some jackfruit instead"* implying that it is a vegetable which they can ask for from a neighbour. However, the estate management generally looks down on growing food plants as the Malaiyaha community does not have rights to the land they live on, to grow food or even build or improve their houses.

At times, the shared predicaments due to scarcity makes such kinship connections through food a struggle, due to the discomfort it brings some people when being forthcoming about their household needs with potential caregivers. This was expressed by a family who explained how even though people ask their neighbours for food items such as coconuts and vegetables, the knowledge about the struggles of others is a sentiment which they have to overcome if and when they ask for such help.

"Whenever we do not have enough food at home, we will ask for items from our neighbours – rice, coconuts and vegetables. We are asking because we do not have the means to buy, however, those families also earn the same amount as us. Despite this sometimes we have no choice but to ask – this is how we are surviving" - Respondent from Thenipita

Attending to the needs and preferences of children, especially in the face of scarcity was a theme expressed throughout the study. Children's preference to eat leafy greens, soya, and red rice was a common dynamic that families aimed to satisfy.

[Photovoice]

Competing costs

With the onset of the economic crisis, the Malaiyaha community are faced with increased and competing costs which consist of a significant portion of their monthly expenditure, leaving less to be spent on food. Compounding this is also lack of public infrastructure in the communities, which means families are having to spend more to access certain types of infrastructure such as healthcare and transport. Owing to increased expenses, in some instances families are having to find alternate means of coping, which impacts their time poverty or expenditure on other areas.

Cost of healthcare

The lack of public healthcare facilities within the communities has resulted in families having to spend a greater proportion of their income on healthcare related services, such as medicine and transport to the closest hospital. A significant portion of their income is spent on healthcare, with it being the third highest item of expenditure in many households. One family noted spending as much as LKR 12,000 for medical expenses for one household member.

"My son is ill and one drug costs LKR 4,000. Therefore, we are struggling to survive, therefore we cannot spend enough on food. Often we will try to make do with biscuits and unsweetened plain tea for lunch". - Respondent from Thenipita

Given that most families had at least one household member with a non-communicable disease, this has a significant impact on families. The most commonly reported illnesses were diabetes, high-blood pressure, high cholesterol amongst other ailments such as eczema and asthma. Families also reported that they found out that they had these non-communicable diseases only when the symptoms presented themselves.

Although they previously had access to a dispensary on the estate which was run by the plantation trust, along with a transport service that would take families to the estate, a reduction in these services over time has meant that families have to spend a higher proportion of their income on getting access to basic healthcare.

"Previously, our community enjoyed access to essential public infrastructure, including a child care centre, a dispensary, and transportation facilities, providing crucial support in times of sickness or injury. However, following the devastating landslide of 2003, these vital facilities were dismantled. The child care centre and dispensary were

repurposed into welfare camps for displaced people. Prior to the landslide, our reliance on expensive medication was minimal, as we had access to a resident doctor within the estate. Unfortunately, in the aftermath of the disaster, this medical support vanished, leaving us without any healthcare services. The loss of these facilities has been keenly felt by our community, and many families now find themselves living in the former child care centre and dispensary, lacking adequate housing options. It is evident that the estate management has opportunistically exploited the landslide as a pretext to evade their responsibility of providing essential public infrastructure and services." - Respondent from Kotapola

With the impacts of the economic crisis, families are making difficult decisions about prioritising what they are able to spend their income on. Households reported that they have to spend money on medicine as Government hospitals are no longer giving essential medicine for free due to a lack of supply following the economic crisis. In some cases, families reported foregoing medicine in order to find money to buy food. In other cases, families noted eating less - in order to save money to buy essential medicine. In addition to this, families also reported having to travel to locations as far as Matara (65 KM) and Colombo (164 KM) to receive medical treatment, owing to the limited capacity and resources at the Deniyaya hospital.

Cost of fuel

Many families used to cook with liquid petroleum gas (LPG) prior to the outbreak of COVID-19 and the economic crisis. However, with the increase in the price of LPG, many families switched to firewood stoves and continue to use it due to the continued unaffordability of LPG. Some, however, keep enough money aside to make sure that they have enough saved up so they can buy a cylinder of LPG when the cylinder needs to be replaced.

Some families also use a range of cooking fuels, such as gas, firewood, kerosene and electric items like the rice cooker based on what fuel is available to them.

"We have a separate kitchen where we primarily cook using firewood. However, a few years ago, during the rainy season, we temporarily switched to using gas for cooking due to difficulties in drying the firewood. Nevertheless, we no longer use gas even during the rainy season, as the skyrocketing prices have made it unaffordable for us." - Respondent from Kotapola

The firewood is usually foraged from the neighbouring areas, so there is often no cost to acquiring firewood, although a few families noted purchasing firewood during the

rainy season or due to other factors. During the rainy season, families find themselves relying on other forms of fuel for cooking, as there is no way to dry the firewood. In these instances, fuel such as kerosene or gas is used for cooking.

Whilst there may be little to no financial cost in the use of firewood, families must spend more time cooking as it takes much longer. Given that it is mainly the women of the household who cook, this further adds to the burden on women's time. Cooking using firewood is also a laborious process which requires a lot of energy spent monitoring and adjusting the flame. Certain families opted to cook with the rice cooker or gas stove alongside firewood in order to save time.

[Photovoice]

[Photovoice]

[Photovoice]

The rising cost of fuel has also impacted vendors who source produce from around the country. Vendors noted mainly sourcing produce from the Embilipitiya Economic Centre (44 KM), which vendors would visit once or twice a week. Vendors also noted sourcing from other locations such as Colombo (164 KM), Nuwara Eliya (196 KM), Dambulla (290 KM), Kella (24 KM) , Bandarawela (148 KM), Akuressa (44 KM), Suriyakanda (37 KM) and Suriyawewa (62 KM) which indicates the diversity of sourcing locations.

The diversity and distance of sourcing locations has also led to higher transport costs borne by vendors. With sourcing locations as far as Dambulla—290 KM away from Deniyaya, transport costs make up a significant portion of their monthly expenditure - often the highest.

"For transport we have to spend around LKR 40,000 per month." - Vendor, Deniyaya Town (who sources produce once a week from the Embilipitiya Economic Centre 44 KM away) -

"[My costliest overheads are] transport of goods from the Embilipitiya economic centre to the shop. We have to spend LKR .8000 per round, and we usually travel twice a week." - Vendor, Deniyaya Town

When the price of fuel increases, vendors suggest that this increase is passed onto the consumer through higher prices in order to protect their profit margins. When asked what support vendors would like to see to enable their business to grow, many vendors noted that they would like financial support to help grow their business, such as low interest loans and reduced fuel prices to enable cheaper transportation.

Cost of electricity

Infrastructure and its associated costs also plays an important role in determining interactions in the food environment and what is consumed within the household. Half of the houses interviewed had a working refrigerator - mainly used to store vegetables, fish and meat. Given that many families weren't purchasing fresh produce daily, the fridge allowed families to buy produce and keep it for a longer period of time. The fridge is also used to store leftover food and usually used for consumption the next day. There were also instances where the fridge was used to store diabetes medicine for a household member.

Compared to the findings from the study on Food Environments conducted in Colombo, which notably, took place four months earlier, where bills may still have been higher, electricity bills don't contribute to as big a portion of household expenditure. Whilst all families in Deniyaya had a metered electricity connection, there didn't appear to be a conscious effort to lower electricity consumption to mitigate rising electricity bills - compared to working class poor households in Colombo who were unplugging fridges and choosing not to cook with time saving electric appliances in order to reduce the cost of their bills. Comparatively, the electricity bills in Deniyaya are also less - which reflects a lower consumption of units overall. Despite this, families are still resorting to coping mechanisms to ensure that their electricity is not disconnected. This includes, taking high interest loans and pawning jewellery - just to stay connected to the grid.

"Once they came to disconnect the electricity connection but we got an immediate loan from a loan shark to pay the bill" - Respondent from Kotapola

"During the COVID pandemic we faced electricity disconnection twice, but we immediately paid the bill by pawning my wife's earrings" - Respondent from Thenipita

"Only once in 2022 did we have to pay the bill by pawning a necklace". The bill amount was LKR 10,500" - Respondent from Kotapola

Cost of water

With regard to water infrastructure, no family is connected to the formal grid. They get water from different sources. In Thenipita, an organisation called Community Development Service for Plantation (CODESEP), connected stream water to a tank through pipes. This is then provided to families for a monthly fee to cover the cost of operation. However, families noted that there are times when the water pressure is very limited, and sometimes even reporting the unavailability of water. Some families in Kotapola noted that they access the water from a neighbour who has built their house on a well. The neighbour charges a flat fee of LKR 300 a month, per family, for providing water to families. Other families in Kotapola noted having access to water from streams following an investment in pipes made by an organisation called CEDA in 1965. Over longer periods of time, neighbours may also share infrastructure such as toilets or provide access to sources of water. It is important to note that some are dependent on paying their neighbours for water which is sourced from streams, while others choose to share the water for free. Families, especially those who work in estates, noted that they prefer to eat rotis for lunch because they do not need to meticulously clean their hands in order to eat them.

Lack of public infrastructure leading to increased costs

Beyond the home, households noted that they no longer had access to public infrastructure. In the Kotapola North Grama Niladhari Division in the Diyadawa Division, families noted that they used to have access to services that included the maintenance of a pharmacy, a creche for children, a cleaning and laundry service for the line houses, and an estate ambulance. There were also cooperatives in operation in the estate which sold goods at lower prices, however, these are no longer operational. The loss of these public infrastructure such as the cooperative means that families are travelling further distances to access food. In addition, the lack of childcare facilities such as creches increases the care burden on women.

Diet and quality of produce

Despite the increases in price and competing expenses faced by these families, food that was good for their health was also considered when determining what food to purchase. Most households were in agreement that okra is good for one's joints, while one household explained that her husband was advised not to eat starchy foods (which were described as "heavy foods"), and instead asked to eat vegetables like okra, ribbed gourd, and beans. Red rice was also described to be the most preferred type of rice and households highlighted that eating red rice was good for certain health

conditions such as diabetes, high blood pressure and its lack of interactions with prescribed medicine.

[Photovoice]

Safety was another key consideration of food choice, especially the perceived risk of consuming pesticides within fresh produce.This often determined what items are bought, and which vendors families buy their fresh produce from. A participant described how they usually purchase vegetables from the Deniyaya town— *"These are transported from places like Colombo and Embilipitiya. We usually get to consume vegetables laden with agro chemicals."* Some households associated certain types of fruits with the presence of agrochemical residues, while one associated a shop to be one which does not sell fresh produce with pesticide residues, which they in turn frequented more. Families determine produce to be fresh mainly by how it appears such as the presence of blemishes and how it feels to the touch.

[Photovoice]

Vendors also expressed similar sentiments about selling good quality produce. Two larger shops which sold vegetables explained that they get their vegetables from Nuwara Eliya because they are of good quality. When asked why they do not source it from elsewhere, they replied that alternative supply chains would not provide a good quality and selection, because it has passed through other nodes in the supply chains.

Another vendor noted that produce is sourced from Akuressa, particularly because the fruits sourced from there use less agrochemicals. This, he said, is important because people buy fruits from him for their religious activities.

Interaction with the school food environment

Overall, students attending primary school are provided a mid-day meal. Although all such meals contained curry, some households mentioned that their children also receive fruit. Most families mentioned that their children consistently take a meal from home and that what the children take to school is what the rest of the family eats as well.

Although many households described how schools are monitoring their children's meals to ensure it is of high nutritional quality, only a couple of mothers described experiences of interventions the school had made when their children's meal deviated from what the school deemed acceptable. *"If we fail [to provide an acceptable meal], the school will ask so many questions about food. However, they understood the financial issues, afterwards they did not bother us."* (Respondent, mother of seven year old) Meanwhile, one family also explained how their child's school had an empathetic attitude towards school meals because the "school understands the family's economic situation" and did not penalise them from not sending healthy food. This is different to the findings in Colombo which highlighted that many parents were not sending their children to school in fear of their child being penalised for not bringing a nutritious meal to school. The school meal programme is also more widespread in Deniyaya than in Colombo.

Policy recommendations

The following policy recommendations were formulated in collaboration with Voice of the Plantation People Organisation and presented to the community for their feedback. The recommendations have been formulated with a view to be presented to the State as they are best positioned to provide support to the Malaiyaha communities, compared to the Estates in which they reside on or work for:

1. Giving communities land rights and right to cultivation: Whilst communities have been given land to stay, they have no rights to the land. Currently, families can't build or improve their homes freely nor are they allowed to grow their own vegetables and fruit as they do not have rights to the land. Giving these estate communities land rights would not only positively impact their access to fresh produce but will also allow them to invest in home building without the risk of being prohibited by the estate.

2. Organising nutrition programmes for estate communities: Families demonstrated a good understanding of nutrition - with some, also trying to adjust diets to ensure family members ate food that was good for their health or specific ailments. However, with the impacts of the economic crisis, as families have been made to cut back on fresh produce, awareness programmes and material should be reintroduced with adaptations to reflect the current context. This could include:

a. Awareness programmes and literature developed on nutrition should be reflective of available and affordable produce and localised at a district or divisional level. For example, nutrition awareness programmes at schools should feature local vegetables and fruits to increase consumption, and not imported or expensive vegetables.

b. The literature must be mindful of the imagery used to depict fresh fruit and vegetables. There is a skew towards fruit and vegetables that are perfectly shaped and bright in colour that deter consumers from buying perfectly edible produce because they don't conform to the images they see. Furthermore, such literature must strive to include more local fruit and vegetables that families can easily identify, and not western and imported produce.

c. The literature should include information on low energy or time saving cooking methods for vegetables. This could also include cooking time for each vegetable as overcooking vegetables and the corresponding decline in nutrients was an issue identified by stakeholders.

3. Provision of food related welfare programmes: Although the study notes that certain participants of the study did receive certain forms of food related welfare, it was also observed that the distribution was uneven. In addition, whilst some families reported getting social security support in the form of Aswesuma, this is a cash handout and does not necessarily improve access to food. We recommend that families are given access to food related welfare programmes that can take the form of a basket of goods and services that can be collected from local vendors. This would not only help improve the communities access to food, but would also support local vendors.

4. Introduction of mobile clinics: With the removal of the health clinics in the estate, and the high prevalence of non-communicable diseases, families are spending significant portions of their income on health-related matters. A mobile clinic that comes to the estates at regular intervals can help to reduce the costs that families have to spend on health-related matters, which can free up income for other essential areas such as food. In addition, as families reported only finding out that they had non-communicable diseases only when the symptoms presented themselves - a mobile clinic could also support testing and early detection of diseases.

5. Increased support for vendors: Given the hardships faced due to the economic crisis, provide greater support to vendors. This may include micro credit schemes to help vendors break cycles of debt, and access livelihood support to improve their business without relying on the informal credit market.

* The CGIAR Research Initiative Fruit and Vegetables for Sustainable Healthy Diets (FRESH) is implemented by CGIAR researchers from IFPRI, CIMMYT, The Alliance of Bioversity International and CIAT, IWMI, and CIP in close partnership with World Vegetable Center, Applied Horticultural Research, the University of Sydney, the Institute of Development Studies, Wageningen University & Research, and the University of California, Davis, Borlaug Institute of South Asia, Sokoine University of Agriculture, Wayamba University of Sri Lanka and the Philippines Department of Science and Technology-Food and Nutrition Research Institute.

**This is because the Tamil and Sinhalese translations of the previously mentioned names lend themselves to be used in derogatory ways. Furthermore, there is a preference among the community to use the identity marker Malaiyaha. Although the name Malaiyaha translates to Tamil people of the hills, the name still manages to somewhat dissociate the community's identity "from the history of indentured labour in the plantation sector and toward[s] conceptualising… [a] future… [for] their home communities and region with a diversified economy".

***Names have been changed to protect identity.

We would like to thank all funders who supported this research through their contributions to the CGIAR Trust Fund.

Sources of information about the study population

1. DCSS. "Department of Census & Statistics of Sri Lanka: Census of Population and Housing - 2012." Accessed December 4, 2023. http://www.statistics.gov.lk/PopHouSat/CPH2012Visualization/htdocs/index.php?usecase=indicator&action=Data&indId=10.
2. Deori, Navaneeta. "Building a Distinct Ethnic Identity; A Study of the Indian Origin Tamils in Sri Lanka." *International Journal of Psychology and Psychiatry* 2, no. 2 (2014),
3. World Bank. "Sri Lanka Malnutrition in Sri Lanka Scale, Scope, Causes, and Potential Response," 2007, 155
4. Ismail, Adilah. "Long Walk for Equality." Print Edition - The Sunday Times, Sri Lanka (blog), 2023. https://www.sundaytimes.lk/230820/plus/long-walk-for-equality-528354.html.

5. Leary, Virginia A. "Ethnic Conflict and Violence in SRI LANKA: Report of a Mission to Sri Lanka in July-August 1981 on Behalf of the International Commission of Jurists." INTERNATIONAL COMMISSION OF JURISTS, 1983, 22
6. Kingsolver, Ann E. "'Like a Frog in a Well': Young People's Views of the Future Expressed in Two Collaborative Research Projects in Sri Lanka." *Human Organization* 69, no. 1 (2010):
7. Koralage, Ama. "Tracing Roots and Winning Rights: the March of the Malaiyaha Tamil Community" Groundviews, 2023. https://groundviews.org/2023/08/11/tracing-roots-and-winning-rights-the-march-of-the-malaiyaha-tamil-community/