

The Farmer's Perspective

Climate Risk and Risk Management in Sri Lanka's Agriculture Sector



Farmer in Trincomalee district

I. The agriculture sector in Anuradhapura and Trincomalee

Sri Lanka's food systems revolve around the production of rice as a main staple crop. In addition, fruits and vegetables, grains, meat, fish, and dairy are also important sources of food security. **27.1% of the country's total population engages in agricultural activities, and agriculture accounted for 7.4% of total GDP in 2020.**

Agricultural practices in Sri Lanka are mostly centered on rural areas, with nearly three quarters of Sri Lankan families depending on rural livelihoods such as crop cultivation and livestock raising, which are linked to **income generation, food security, and social status.**

Key takeaways

- The majority of farmers in Sri Lanka's dry zone districts of Anuradhapura and Trincomalee are smallholders with a heavy reliance on rainfall, low mechanization, and an agricultural calendar revolving around the two annual monsoon seasons.
- Farmer decision-making is based on several variables and considerations that include inputs and assets, risk management, weather data, advisory, rural infrastructure, finance, and insurance.
- Major challenges faced by farmers in the two districts include climate-related production risks, fluctuating market conditions, lack of direct market access, and limited financial literacy and trust in insurance solutions.

The dry zone districts of **Anuradhapura** (marked in brown) and **Trincomalee** (marked in green) in Sri Lanka's North Central and Eastern province are home to almost 1.4 million people, 6.3% of the country's total population. Together, these districts provide close to one fifth of Sri Lanka's total paddy production as well as a range of other field crops, fruits, and vegetables.

The information in this brief is based on a survey, group meetings, and individual follow-up interviews conducted by SLYCAN Trust in Anuradhapura and Trincomalee in 2020-2022.

In total, close to 600 farmers, local supply chain actors, and women and youth from farming communities were engaged across four selected DS divisions. Findings from this process were further supplemented from SLYCAN Trust's continued work with farming communities in these districts, which has taken place since 2018, as well as input from national and local government officials, experts, researchers, and practitioners.



II. Cultivation cycles and the farmer's life

The majority of farmers in the two selected dry zone districts are **smallholders**, with survey respondents having a median cultivation area of 2-3 acres of paddy and 1-2 acres of other crops. These farmers often do not own the land they cultivate (34% of respondents) and mostly rely on rainfall (42%) or agricultural wells (17%) for the irrigation of their crops. In addition to their main cultivation, many farming households also have home gardens and keep small numbers of livestock in the form of chicken, cows, or buffaloes.

The **key staple crop is rice**, which is supported through a system of major and minor cascade tanks for irrigation. Most other agricultural operations, including field crops such as green gram, maize, cowpea, black gram, or big onion, are rainfed and often not connected to these

irrigation systems. Besides the above-mentioned crops, other widespread crops in the selected districts include chili, peanuts, pumpkin, finger millet, brinjal, bitter gourd, ladyfingers, bananas, and mangoes.

The **agricultural calendar in Sri Lanka's dry zone** is structured around **two cultivation seasons, Maha** (the major season from October to March) and **Yala** (the minor season from April to June). Generally, all farmers cultivate during the Maha season, which is supplied with strong rainfall by the North-East monsoon, while not everyone might be able to cultivate during Yaha. Research findings indicate that surpluses from Maha season harvests are often used to make investments (such as machinery or jewelry) that act as a buffer in case of insufficient Yala harvests.

Farmers are organized through associations and have grassroot-level structures that facilitate collective decision-making and connect them to local authorities (such as cultivation committees). At the beginning of each cultivation season, farmers conduct *Kanna* meetings to decide on the extend of cultivation and allocate water from the local tanks to individual areas and farmers based on a quota system (*bethma*).

Sri Lanka's agriculture sector still largely relies on traditional skills and technologies with only limited adoption of modern methods of agriculture. Due to the **low degree of mechanization or modernization**, agricultural operations are slow and do not have the capacity to react to unexpected weather changes or shocks. Farmers often rely on middlemen to sell their produce, as many do not have established distribution channels, lack transport or storage capacities, and are not well connected to local urban centers or markets in major cities.

Among the surveyed households, respondents reported an average number of five different buyers for their paddy and other produce, with 60% of respondents stating that they sell to different people in different years. **For paddy, the majority of farmers (81%) rely on these intermediate buyers to come to their villages** to collect the harvest, with only 19% of farmers

– Mrs. J. Nirosha
Saman Kumari

Farmer,
Kilekadawala,
Trincomalee
district



"I have engaged in farming since I was 15 years old. We grow paddy, coconuts, mangoes, and various other crops. However, our crops constantly get attacked by wild animals such as monkeys and elephants. [...] One day, it rained for three consecutive days after we had brought the harvest home. About 24,000 to 26,000 kilos of paddy got caught in the rain. The entire harvest turned black. I had to sell a kilo of paddy only for about LKR 15 to 18. With that, I could not pay back my loans and went into debt. [...] We continue our livelihoods amidst such obstacles."

venturing to find their buyers in markets or shops in nearby towns or directly selling to private rice millers. **For other produce, the majority of farmers (55%) rely on middlemen coming to town**, but there is also a large number of farmers (46%) who sell directly to markets or economic centers in nearby urban centers.

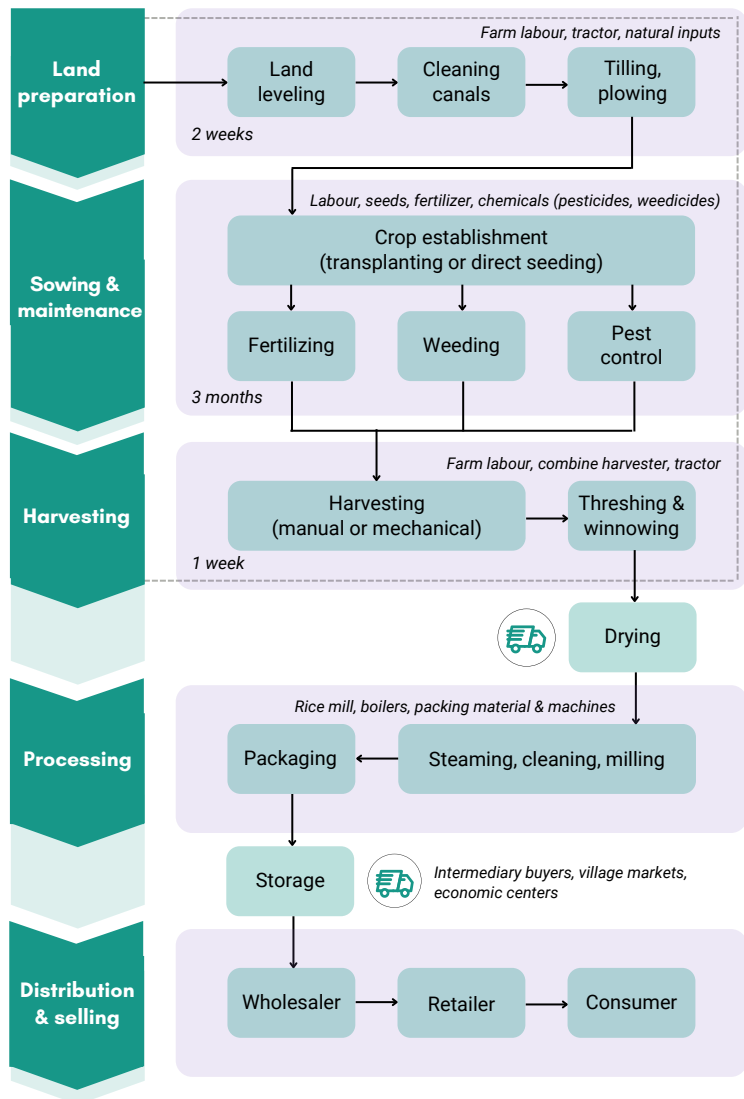


Group meeting with farmers in Trincomalee district

III. Key considerations from the farmer's perspective

Key variables for efficient decision-making and optimization of food systems in Sri Lanka include temperature; precipitation; wind speeds; ambient humidity; soil health and makeup; crop and input types; available quantities of fertilizer, fuel, labor, pesticides, and insecticides; growing times; historical yields; storage facilities; transport options and distance to markets; risk assessment and management capacities; financial resources; access to financial services (such as loans); machinery; capital assets; and a multitude of other factors depending on the farm size, cultivation extend, and socioeconomic and sociocultural characteristics.

Farmers are part of **complex supply and value chains** with a variety of steps and actors that go from input providers to consumers. Decision-making around cultivation must also take into account the various up- and downstream consequences and actors that influence farm operations and household income.



Example of a paddy value chain in Anuradhapura/Trincomalee



Farmer in Trincomalee district

The next page goes into more detail on the following **five key categories of considerations** for smallholder farmers in Sri Lanka:

- Inputs & assets
- Risk management
- Weather data & advisory
- Rural infrastructure
- Finance & insurance

These considerations are fundamental to successful crop cultivation and directly influence the **wellbeing, livelihoods, and resilience of farming households**.



Inputs & assets

Agricultural ecosystems are faced with the key challenge of preserving soil fertility and productivity despite removing significant amounts of nutrients (nitrogen, phosphorus, potassium etc.) with every harvest. Farmers rely on different categories of inputs to cultivate crops and conserve or enhance soil fertility. This includes seeds, farm labour, and fertilizer, which can be anorganic (mineral fertilizer) or organic (manure, compost, biosolids, guano). In addition to these inputs, farmers use pesticides and weedicides and own or employ productive assets, such as land (usually leased by the government), tractors, or combine harvesters. As most farm operations are small-scale in nature, machinery is often rented or collectively owned.



Risk management

Agricultural operations face a multitude of risks including production risks that affect yield or product quality (such as climate risks, other weather-related risks, or pests and diseases); market risks (such as volatility of input and output prices, availability, and quality or supply-demand fluctuations); financial risks connected to debt, equity, interest, or cash flow requirements; environmental risks; enabling environment risks; social risks; human element risks (accidents, illness, death); and infrastructure-related risks. To manage these risks, farmers engage in risk prevention and risk reduction measures (such as supplementary irrigation or resilient crop varieties), risk-sharing (mostly through farmer associations), risk transfer (such as insurance), and risk retention (often in the form of money savings or pawnable assets).



Weather data & advisory

Farmers need information derived from accurate, timely, and reliable data to make rational cultivation and risk management decisions. This includes information related to market demand and price volatility, but also weather forecasts and actionable cultivation advice based on agrometeorological conditions. Farmers can access the weekly "agrometeorological bulletin" published by the Department of Meteorology, which is based on weather information collected through the Department's network of 42 agrometeorological stations throughout the country. Farmers are also provided with climate and cultivation advisory by the Department of Agriculture (Natural Resources Management Center) at the beginning of each season and bi-weekly weather forecasts available in Sinhala and Tamil language.



Rural infrastructure

Infrastructure includes roads and railways, but also the availability of transport vehicles, storage facilities, electricity, water, and other key utilities. Among Sri Lankan farming communities, only a limited number of households own a vehicle, and household members either use buses (infrequent but cheap) or three-wheelers and private vans to make trips to nearby towns and access spices, other vegetables, clothes, medicines, or children's tuition classes.



Finance & insurance

Due to the inherent uncertainties of agricultural cultivation, farmers often rely on savings, community savings, or loans to ensure financial liquidity and allow them to make necessary investments in inputs or machinery. However, due to lack of collateral and proof of land ownership, farmers often have limited access to loans from formal financial institutions and can fall prey to informal lenders with high interest rates. There is little initiative to invest in insurance, and it is often purchased only as a prerequisite for obtaining loans from formal financial institutions.

IV. Challenges and constraints

The two foremost challenges faced by smallholder farmers in Sri Lanka are related to **production risks and fluctuating market conditions**. These pre-existing risks can be exacerbated or compounded by **climate change, which adds an additional layer of uncertainty to agricultural operations**. In many cases, extreme weather events or unexpected shifts in weather patterns can exceed the coping capacities of farmers, causing severe losses and damages and threatening to push them into debt traps or poverty.

Climate change clearly increases **production risks** by causing a higher variability of seasonal precipitation patterns as well as rising ambient temperatures. Mainly rainfed crops are exposed to a lack of rainfall at some times and heavy excess rainfall at others, which can damage harvests or lead to delays in the beginning of agricultural seasons, forcing farmers to shift to shorter-duration crop varieties with reduced yields.



Drying rice in Trincomalee district

Out of the surveyed farmers in Anuradhapura and Trincomalee district, **92% reported impacts related to high temperatures or heat waves, 88% to rainfall changes, 81% to water scarcity or droughts, and 70% to groundwater scarcity**. Other key climate-related impacts reported by the survey respondents include increasing prevalence of pests and diseases (88%), soil degradation or depletion (71%), and heavy winds or storms (61%).

Reported issues & challenges (based on survey & group meetings)

Food supply chains

- Water distribution & management issues
- Lack of quality standards for distributed seeds
- High cost for chemical fertilizers & pesticides
- Insufficient information on market demand & prices
- Need for more knowledge about climate change & alternative farming methods
- Health impacts from use of pesticides & weedicides
- Lack of interest of youth in pursuing farming careers

Environment & water

- Weather- & climate-related impacts (heat, water scarcity etc.)
- Groundwater pollution
- Increasing soil infertility & salinization
- Reduced capacity of irrigation tanks due to siltation & invasive species
- Spreading of invasive weed species in paddy fields
- Crop damage and human-wildlife conflict
- Increased pests (such as *Sena* caterpillar) & diseases

Finance & insurance

- Limited trust in existing insurance schemes & limited awareness of their functioning & modalities
- Perceived lack of transparency of loss & damage assessments
- Limited ability of smallholder farmers to pay premiums
- Reduced income due to reduction in yields & failed harvests
- Lack of guarantees or cash support from supplier or buyer side

Market risks, on the other hand, can threaten the livelihoods of farmers even in cases of successful harvests. Smallholder farmers in particular are vulnerable due to highly fluctuating returns in the absence of fixed prices or confirmed buyers. They do not have direct access to markets and lack the starting capital to modernize their operations, which would allow them to better organize and react more quickly to changes in supply or demand conditions.

The **low diversification of input providers and buyers for paddy and other produce** is a key challenge for farmers hoping to get better prices. With regard to selling, more than half of survey respondents (53%) reported low market prices as one of their main issues, with transport (26%) and storage (16%) as the second and third most often cited difficulties.

Some of these challenges are further exacerbated through **cross-cutting issues**. These include, for example, issues related to poverty; lack of risk, financial, or insurance literacy; the vast informal economy of rural areas (including informal farm labour); predatory moneylenders; gender-related inequities; vulnerable groups; or marginalization.

Farmers in both districts are **trying to manage these risks through a variety of new practices or coping methods**. More than a third of surveyed farmers are trying to plant improved or heat- and drought-resistant rice varieties (36%) or seek to obtain better weather and early warning information (35%). Shifting planting or harvest cycles (31%), diversifying income sources (28%), and improved water management (24%) are other techniques employed by some farmers.

– Mr. Dharmasiri Rathnayaka

Farmer,
Morawewa,
Trincomalee district



"In times of dry weather, we have taken measures in recent years to cultivate other crops instead of paddy so farmers could have at least a small income. This was done to adapt to climate change. We must find solutions to help every farmer in this area."

Adopted practices & coping methods (based on survey)



V. Entry points and perspectives

Farmers are aware of the challenges they face and often have a good working understanding of climate-related impacts and production risks.

However, many smallholder farmers do not have the necessary awareness, knowledge, technical expertise, equipment, or resources to adequately manage these risks and enhance their livelihood resilience.

The following areas for improvement and further research have been identified based on the data collection among farming communities as well as input from national experts:

Cultivation

- Potential for inter-seasonal/third season cultivation with residual moisture
- More resilient or higher-yielding crops and crop varieties
- Modernization of cultivation through farm implements, machinery, and digitization
- Additional instruction and training on inputs
- Improved infrastructure, transport, and storage, including cold storage facilities for perishables
- Reduction of post-harvest losses and waste
- Upgraded market access and distribution networks, reduction of intermediaries

Enabling environment

- Awareness creation and capacity-building on climate risk management mainstreamed into education and training
- Enhanced information flows and market information to enhance decision-making around cultivation
- Identification of "progressive farmers" to promote good practices

Finance & insurance

- Shift from agricultural credit towards a robust and dynamic rural financial system
- Agronomic skill development, financial and insurance literacy, and financial inclusion
- Entrepreneurship support, agricultural certification, and economic diversification
- Innovative risk transfer and insurance solutions

Cross-cutting

- Gender equality and reduction of access barriers and vulnerabilities
- Youth and community empowerment

Organizational profile

SLYCAN Trust is an internationally recognized non-profit think tank working on climate change, sustainable development, biodiversity and ecosystem conservation, animal welfare, and social justice including gender and youth empowerment. Our work spans the national, regional, and global level from policy analysis and evidence-based research to on-the-ground implementation. For more information, please visit our [homepage](#) or the [Adaptation & Resilience Knowledge Hub](#).



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