

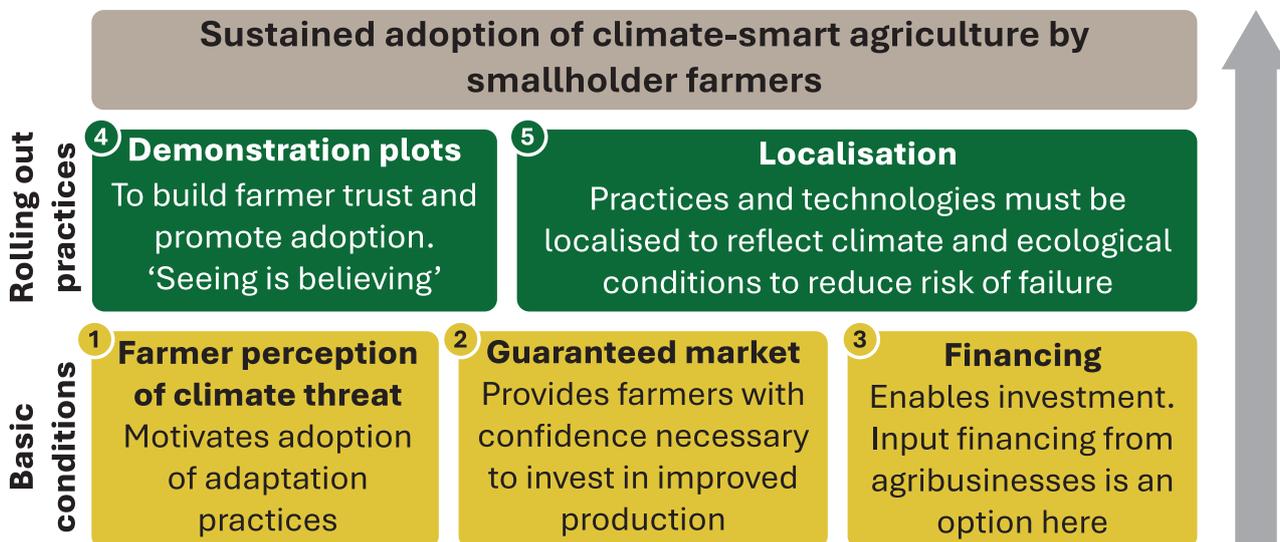
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CASA and Climate Change

Climate change has directly affected food production systems, creating scarcity or loss of food. The Asian Development Bank suggests that Nepal will likely lose 2.2% of its annual GDP due to climate change by 2050. Farmers are finding it hard to plan and manage production due to changing crop patterns. In Nepal, the Commercial Agriculture for Smallholders and Agribusiness (CASA) Programme supported its partners to apply climate-smart agriculture (CSA) practices to transform agri-food systems towards green and climate-resilient practices with their project interventions in Provinces 2 and 5. In the vegetable sector, CASA partnered with Paicho Pasal Pvt Ltd, one such agribusiness that has more than 15,000 farming households in its supply chain. To mainstream climate change adaption measures at farmer level, CASA

supported Paicho to employ Junior Technical Assistants (JTAs) who work year-round on providing timely advisory services, imparting knowledge to farmers on nursery management and integrated pest management, and introducing new varieties of disease-resistant seeds and climate-smart farming technologies. The JTAs also run demo-plots in each collection centre to acquaint and educate farmers on new technologies and farming practices.

To understand how the adoption was possible at farmer level, CASA conducted focus group discussions at seven different locations with Paicho’s farmer groups and generated five key steps that help farmers transition from traditional farming technologies into more climate-smart ones. These also point to potentially important pathways for climate change outreach to farmers.



1. Adaptation action is possible only when farmers perceive climate change as a threat.

Farmers largely endorse adaptive action focused on preparing for more extreme weather events but to be willing to take sustainable long-term adaptation measures, farmers need to perceive that the climate is changing or could change, and they need to attribute enough weight to this perception before they will act. Almost all the farmers agreed that extreme weather and untimely rainfall had affected their production and productivity in Provinces 2 and 5. In this sense, perceiving that the climate is changing can be seen as a pre-condition for the adoption of agricultural adaptation measures.

2. A guaranteed market is the bedrock for adoption.

Although farmers operate at multiple scales, their adaptation decisions are primarily driven by short-term on-farm benefits arising from the investment. In a world with perfect information, complete markets, and adequate incentives, the decision to adopt or implement a particular adaptation measure would simply be a matter of evaluating the net benefits of the technology.

Once they have adopted climate-smart agriculture practices, the farmers may see improvement in their productivity, yield, and the overall quality of their vegetables and crops, but all will be to no avail if the farmers do not have a place to sell their produce. The market guarantee has been the single most important driver for adaptation for Paicho's farmers as the company buys outputs from farmers in any quantity. This way farmers can completely focus on production and not worry about the markets.

3. Financing the practices and technologies is essential.

A crucial factor hindering overall adoption is that some smallholders find the technologies to be beyond their financial capabilities. In Nepal, micro-financing the agriculture sector has become a common practice. There is a plethora of options available for farmers requiring little to no collateral. Helping the farmers get connected to options helps them finance the technology of their choice, helping them improve their productivity. However, there are often instances when supplying smallholders do not want to go through the bank lending route (due to lack of trust or complex procedures) and find it too difficult to directly deal with the service provider due to the financial resources required. In this case, the company provides the credit.

4. Demonstration plots to visualise the benefits are beneficial.

Demo-plots are one of the most common features of agricultural extension and are important tools for enabling farmers to learn first-hand about improved agricultural production practices. Well-organised demonstration plots contribute to the dissemination of information that simulates farmers to adopt new innovative ideas and practices to improve the quality of produce and increase farm output and income. Conducting demo-plots also helps to intensify the impact of training and stimulate interest and credibility.



Farmers in Gulmi introduced to the concept of demo-plots as a part of their theoretical session conducted by Paicho's JTA

In Paicho's case, the company has demo-plots run by company staff in most of their collection centres, where farmers can witness the new technologies in action and observe the increase in productivity before they start adopting. "Some even doubt the technology until the produce is harvested and they get to see for themselves the changes. Farmers want 'foolproof' technologies", says Srijal Wagle, Lead JTA at Paicho.



Women planting seeds in demo-plots, installed under tarps to protect the vegetables from harsh sunlight and rain

5. Finding the right climate-friendly technologies and practices is key.

While there are various climate-smart technologies available, every farm is unique and there is no one-size-fits-all approach. Technologies must be tailored to the specific needs of the location and the plot of land to produce the best results. This meant that there was a resource dedicated to combating the situation. Thus, farmers were advised by the JTAs to install drip irrigation systems that provided the fields with an ample supply of water, while conserving it.



Drip irrigation system installed in commercial fields supplying to Paicho Pasal

A few farmers from the group discussions put forward their plans to install an advanced irrigation system once they have funds available as they clearly saw the benefit outweighing any risks. Only then would the farmers be willing to see the pros and cons of such practices. Starting with frugal technologies using locally constructed, easily maintained technology appears to be a good approach, and may lead to more sophisticated technologies over time.



Most applied farming techniques are tunneling and drip irrigation, used to combat climatic change in Gulmi.

Current Situation

With this support almost 60% of Paicho Pasal's farmers now practice mulching or tunnel farming and 25% use drip irrigation and other water conservation techniques. The group discussions revealed that the farmers have increased their productivity by an average of 27% and they will continue to adopt new technologies in the presence of a market guarantee by Paicho Pasal.

Story from the Field



Iman Singh Rana and his family took up farming as a profession nine years ago, when they first encountered Paicho Pasal. Mr Rana approached Paicho as a potential farmer during their establishment phase and was also given a chance at employment in one of Paicho's branches in Gulmi.

Mr Rana and his wife were taught by Paicho technicians how to farm commercially and were introduced to the idea of instilling climate-smart practices through the simple use of tunnelling and mulching. The couple initially opposed the idea because they did not think such practices would benefit them. In their eyes, the practices were costly, they lacked knowledge about the available technologies, there was no manpower to install them, and they did not think it was worth financing such practices and technologies since they had not thought of becoming commercial farmers. "We had to do a lot of convincing and had to win in debates with our supplying farmers such as Mr Rana. Farmers think of adoption of such practices and technologies as something risky and so they are not motivated to even try, no matter how beneficial," says Mr Dhruba Neupane, Paicho's CEO.

Mr Rana started implementing climate-smart practices in 2019. He initially installed tunnels and used mulching and a drip irrigation system for his tomato and chilli fields. Mr Rana says, "Paicho convinced us to try these methods in a smaller field for one season. They assured that our produce would be bought by Paicho because it would come out with superior quality. They installed a mulching system and tunnels to help improve soil conservation and lessen the effect of erosion. Drip irrigation was also used to provide water efficiently to the crops and vegetables in the field. Honestly, it did not work from the get-go. We had to get used to it and had to find the required manpower, but the result was amazing." The fields that were experiencing soil, manure and fertiliser erosion were being conserved and the crops which would not get enough water due to extreme cold or heat were being

saved due to ample supply of water. Productivity was high, the practices protected the vegetables, and the field did not need constant tilling even while doing crop rotation as the soil was in good condition to go forward with further plantation.

Mr Rana was so pleased that his family went on to build a water conservation tank, later connected with the drip irrigation system. A 1,000-litre tank was installed that could easily supply water to all their fields for two days using the drip irrigation method instead of using the 4,000-litre tank they would have required if the method was not used. It helped save irrigation costs which was important in a water scarce

area such as Gulmi. Mr Rana earns NPR 6 Lakh (about £3,500) annually in revenues after selling cucumber, chilli, carrot, sweet corn, tomato, cauliflower, and lettuce to Paicho every season. In the last season, Mr Rana's farm alone could supply Paicho with 1,400 kgs of chillies, 8,000 kgs of tomato and 400 kgs of shimala chillies. They had only spent around NPR 80,500 (£470) to install the technologies and NPR 3,50,000 (£2,040) in overall expenses, earning NPR 2,50,000 (£1,460) in profit and savings. Over the two years since he established climate-smart practices, Mr Rana has turned into a commercial farmer, providing employment to two more people and more during plantation and harvest seasons.



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