ENABLING FARMER PRODUCER ORGANISATIONS TO PROMOTE CLIMATE RESILIENT BUSINESS MODEL: CASE STUDY FROM SIRMOUR DISTRICT OF HIMACHAL PRADESH

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ABSTRACT

Small and marginal farmers have been experiencing changes in temperature, precipitation both in terms of magnitude and frequency, and the consequences that these extreme weather conditions inflict on the crops they produce. Collectives and cooperatives of farmers such as FPOs, have potential to adapt to climate change and strengthen their resilience against its impact. The sense of urgency being perceived by FPOs often reflected in impromptu measures need to be triangulated with climate data and modelling analysis. This case study provides insight regarding level of awareness among FPOs about climate change, and degree of willingness to take 'additional' measures to safeguard their business from climate risk. It may be noted that while most of the FPOs are still in the early phase of building their business, they are well aware of the risks that climate uncertainties can potentially bring to their business.

INTRODUCTION

The 15th edition of the World Economic Forum's (WEF) Global Risks Report 2020 (WEF_Global_Risk_Report_2020.pdf (weforum.org) Page 2, Retrieved 03 October 2021), stated that the top five risks in terms of likelihood are extreme weather, climate action failure, natural disasters, biodiversity loss and human-made environmental disasters. They all fall in the one category of climate change and related environmental disasters. In 2019, climate change contributed to extreme weather events causing at least $100 billion in damages. By 2050, cumulative damages from climate change may reach $8 trillion, impoverishing by 3% of gross world product and the poorest regions by more of their gross domestic product (GDP) ("Global economy will be 3 percent smaller by 2050 due to lack of climate resilience". Retrieved 03 October 2021).

In 2018, climate change cost India over $37 billion (Global Climate Risk Index 2020), the economic loss is nearly twice than what India lost ($79.5 billion) between 1998-2017. Multiple reports suggest that heat stress will force India to lose 5.8% of its working hours by 2030 with agriculture and construction sector suffering the most. Variability and uncertainty in climate make it much more challenging to ensure livelihood security of population of India of which large proportion depends on agriculture which is highly prone to the effects of climate change. Agriculture sector is seen as one of the worst hit and smallholder farmers who constitute about 85% of India's farming population can be put in 'severe' risk category due to lack of easy access to quality inputs, market options, information, extension, finance, technology and allied services. Between 2010 and 2040 there is a possibility of crop yield fall by 4.5-9% (approx.) due to climate change which may lead to a 1.8% (approx.) fall in GDP.

Agriculture being the mainstay of rural India, the Government of India has put significant focus on introducing range of reforms and transformative measures. Decisions have been made towards strengthening agri-infrastructure, agro-logistics, supply chain integration through cluster-based approach, adopting newer technology and improving capital issues. The Government of India has also announced a goal of incorporating 10000 FPOs by 2023, supporting the larger farmer community with efficient production and land systems.

Promotion and strengthening of Farmer Producer Organisations (FPOs) has gained a big impetus by government and financial institution to safeguard farmers in general, and small and marginal farmers in particular from the risk of climate variability. Collectives and cooperatives of farmers have potential to adapt to climate change and strengthen their resilience against its impact (Ban Ki-moon calls for collaborative action on United Nations Day - Co-operative News thenews.coop). Farmer Producer Organization (FPO) are established under the statute of companies Act or the State Co-operative Act. The FPO follows a very unique model of collective and crowdsourced efforts from like-minded farmers belonging to a particular region or growing common crops.

OBJECTIVES

Farmer Producer Organizations (FPOs) are increasingly perceived as a transformational instrument to increase income of farmers and promote sustainable livelihood opportunities, especially, for small and marginal farmers. Government of India, state governments and development finance institutions like NABARD have initiated multi-pronged measures to strengthen capacities of FPOs and enable them to access requisite technical, managerial and financial competencies. While

evolving approaches and mechanism to support FPOs towards securing sustained livelihood opportunities and increasing their income it is important to acknowledge and consider huge risk to agriculture sector being posed by ever increasing vagaries of climate change. While FPOs have potential to usher a paradigm shift in Indian agriculture ecosystem they have to be supported and nudged to evolve transformational strategies and practical approaches to deal with huge uncertainty and risk posed by climate change.

Against this backdrop, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) in partnership with NABARD undertook an analysis to develop a deeper understanding on the perception and experiences of FPOs about potential of climate risk and its impact on their business models as well as to assess their readiness to take requisite measures to adapt to the risk posed by climate change. The analysis was carried out under Indo-German bilateral cooperation project on Climate Adaptation and Finance in Rural India (CAFRI) being jointly implemented by NABARD and GIZ. The analysis captures felt needs and demands of FPOs on technology, access to credit and market linkages for adapting to the changing climate and developing climate smart-business models.

METHODOLOGY

This study followed a case study approach of data collection and analysis. Focus Group discussion (FGD) using participatory methods was used to capture farmers' perceptions about impact of climate change on the business of their FPO. An excel based semi-structured tool supported capturing of information on patterns of climate signals, its physical effects on the eco-system and farmers as well as the elements exposed to these effects. The excel tool had specific sections to capture FPOs current capacity to cope with the impacts of climate risk and identify short-, medium- and long-term adaptation measures. The excel tool consolidated FPOs views on benefits and issues related climate change and existing business model.

The FGD was organized at Nahan, Sirmaur District, Himachal Pradesh during 16-20 September 2021 with five FPOs, namely, The Vijeshwari Agro Marketing Co-operative Society Limited, Devansh Jai Kisan Marketing Cooperative Society Limited, M/s. Vardhan FPO, M/s. Shradha Agro Marketing FPO, and Renuka Agro-Marketing Cooperative Society Limited. Participants from each FPO included a CEO, Board of Directors, and at least one female member. The FGD was also attended by the Cluster Based Business Organisation (CBBO) which is mandated to support management and promotion of FPO business. These FPOs are located in Pachhad and Sangrah blocks of Sirmaur district in Himachal Pradesh which covers mid to high hills and sub humid to temperate wet climatic situations. FPOs are primarily into the business of input procurement, aggregation and marketing of garlic and ginger.

Semi-structured interview with Programme Director of Krishi Vigyan Kendra (KVK) and expert on Organic farming in the district was organized to understand their views on climate change impacts in the district. They highlighted the impact of changing climate on the zone boundaries of Sirmaur district. In addition, virtual discussions were organized with Cluster Based Business Organizations (CBBO), District Development Manager, NABARD to identify and profile FPOs on certain parameters to select for this study. The virtual discussions were held on Microsoft Teams platform.

In addition, the Climate Change vulnerability assessment study conducted under National Adaptation Fund on Climate Change (NAFCC) Project in Sirmaur district, Himachal Pradesh (https://sladrc.in/wp-content/uploads/2019/04/CC_Report_Sirmaur.pdf Page 35) was also referred to not only get an insight into a community-based climate vulnerability analysis of Sirmaur district but also relate with the climate projections made in the study using climate data.

One of the major methodological challenges identified during the study was on communicating concept of climate change to FPOs. This was addressed by using a combination of locally used terminologies and facilitating interactive group exercises with charts and meta-cards to unpack the concepts of climate signals, hazards, vulnerability and risks. The reluctancy by the FPO to share their business information for the study also posed a challenge to get a deeper insights into the dynamics and nuances of the business models of FPOs. agricultural practices.

RESULTS & DISCUSSION

Climate Signals and Physical Effects: The FPO members conveyed that in the last 5-10 years they have been experiencing uncertain and extreme weather events like delayed onset of Monsoon, shrinking of rainy days (Earlier 8-10 days continuous, now fewer days), increase in high intensity of rainfall events in shorter durations, increase in average temperature from 30 deg to 35 degrees, increase in minimum and maximum temperature, increase in frequency and size of hailstorms and lower snowfall.

The physical effects of these climate signals as experienced by member farmers were reported as delay in crop production, reduced crop production, drying of water bodies, damage to crops as leaves become yellow due to frost, decrease in ground water level, landslides, topsoil erosion, water-runoff, flooding of crop fields, increase in garlic and ginger infection and pest infestation and loss of moisture in the soil. The member farmers voiced their concern that the above changes have significantly impacted the small and marginal ginger and garlic farmers, rainfed farming fields, garlic and ginger crops,

natural water resources like tanks, streams and rented storage facility (Godown). The members also shared inability of FPO to cope with or adapt to these impacts, and shared their fear that if adequate measures are not taken now, things will get worse in coming 5-10 years.

EXPOSURE ELEMENTS

Adverse climate effects are reported across exposure elements infrastructure and operations, stakeholders, finance and markets. The climate hazards listed above exposes the small and marginal ginger and garlic farmers, rainfed farming fields, garlic & ginger crops, natural water resources like tanks, streams and rented storage facility (Godown). The reasons of susceptibility to hazards are shortage of water availability and adequate amount of water/irrigation facility, low productivity of crops, step-farming practices and washing-off of nutrients from soil, dependency on rainfed agriculture, lack of storage capacity, lack of market due to poor quality of damaged crops and increase in moisture in godown spoils garlic. The crops are exposed to climate hazards which damages the crops resulting in decreased crop productivity. Crop damage lowers the quality of crops and this does not provide right market price. A post-harvest loss of around 15% is incurred by the FPO annually due to bad quality of crops.

VULNERABILITY TO CLIMATE HAZARDS

Based on the discussions, the member farmers from 3 out of 5 FPOs, raised concern that currently they are not able to cope or adapt to the climate hazards. Heavy rains result into water logging, flash flood, landslides. The landslides and blocked roads hamper the access of essential items like seeds, tools, fodder for the cattle and delivery of products adversely affecting pre-production, production and post-production processes. Three out of the 5 FPO, highlighted that since they neither owns a vehicle nor has the storage capacity, they can't wait and sustain the produce for long and has to sell them at lower rates in the local markets.

Two of the FPOs (Vardaan & Shradha) are currently using plastic covers and small rooms to protect the vegetables and it wants to own good storage space for proper storage of products. Currently the Vardhan FPO tries to make small ponds/tanks in the fields to prevent water wastage (coping capacity) and think that dams will improve FPOs adaptive capacity and prepare it for future signals. The Vardaan FPO also tried to reduce their post-harvest loss by setting up a small processing unit but failed as they were not able to repay the members due to the FPO incurring financial loss. All the five FPOs have no money reserves and cash flow and are looking for financial support to run and build their business.

CLIMATE RISK

The study used a scoring and ranking methods in consultation with FPOs to comprehend magnitude and probability of hazards to prioritize climate risk and impact on their business. The top five climate risks assessed based on FPOs perception are: 1) Decrease in crop production (ginger, garlic, onion) due to water shortage, 2) Lack of overall collections of produce for market due to damage of crops due to no proper storage or processing facility, 3) landslides hamper the storage, transportation and delivery of harvest, resulting in post-harvest loss, 4) Low productivity due to pest and disease attack in Ginger, Garlic with no proper storage/management practices, 5) frost and hailstorms disrupt germination and growth of plant in the early stage of production, leading to significant loss of crop production.

In the long run, with the compounding of climate impact, farmers and FPOs feel they will lose their livelihoods and business entirely because of both lack of revenue, increasing costs, and dwindling capacity of the farmers to tackle these hazards.

ADAPTATION MEASURES TO ADDRESS CLIMATE RISK

In Sirmaur, 3734 ha are under garlic production and 57205 metric tonnes was produced in 2019-20. Whereas an area of 1500 ha was under ginger production in the district and 16650 metric tonnes was produced in 2019-20. The data clearly depicts that any impact on the ginger & garlic value chain would have an impact on the farmers' income. The study highlighted the following interventions that are being considered and suggested by the FPOs to adapt to the impacts of climate change to their business:

1. Productivity Gains: The aim here is to improve productivity of ginger & garlic farmers in Sirmaur. This would be done through a combination of the following.

a) Improved Seed Varieties and Mixed cropping: Introduce improved seed varieties for garlic and ginger, in collaboration with KVKs. At the same time, through a combination of trainings, demo plots and extension support, mixed cropping practices, seed treatments and proper crop management.

b) Soil Enrichment Measures: There is a need to consciously seek building of community owned assets like Bund making and Water harvesting structures to aid moisture retention, provide supplementary irrigation during dry spells and aid more crop cycles by farmers that aid soil development.

c) Efficient Cultivation: Introducing the ginger & garlic farmers to the benefits of low-cost land and water management practices, to help them more efficiently cultivate their land. Use of solar pumps for irrigation and renting of pipes for water diversion from ponds are some of the measures.

2. Value Addition: Value addition facilities to develop a ginger & garlic processing cluster in the district would be of the following types

a) Primary Processing & Storage: Cleaning, grading and sorting units to enable sale of Ginger & garlic as either a crop or processed powder. Powdered ginger & garlic are used for medicinal properties and can be stored for longer periods. Cold storage facilities or storage with optimum temperature needed for ginger and garlic should be established for safeguarding post-harvest loss.

b) Marketing: Powdered ginger can be produced at a micro-enterprise level by women SHGs, while packaging and marketing support would be provided by the FPOs. Establishing market linkages with private sector and branding the products would support the FPO business and income.

Study finding reveal that farmers are well aware of climate change and its adverse effects.

CONCLUSION AND SUGGESTIONS

The buzz around 'scientific climate modelling, projections and risk assessment" needs to acknowledge the fact that FPOs are deeply involved in addressing day to day challenges related to crop productivity, loss and damage and marketing. FPOs do recognize the facts that these challenges are directly or indirectly linked to climate vagaries and they have to evolve and develop business model that safeguard them against these risks. They have been experiencing changes in temperature, precipitation both in terms of magnitude and frequency, and the consequences that these extreme weather conditions inflict on the crops they produce. However, the vital set of adaptation measures that FPOs often implement cater for seasonal adaptation that may include measures related to irrigation, changing crop variety, switching to non-farm income, and at times change in their cropping pattern.

The sense of urgency being perceived by FPOs often reflected in impromptu measures need to be triangulated with climate data and modeling analysis. The triangulation will not only bridge the gap between 'science' and practice but will help in identifying robust measures that FPOs can prioritize to implement to safeguard their business from climate risk. The interpretation of complex climate model need to be simplified to facilitate FPOs to take a climatically informed decision.

Another important insight emerging out of this case study is regarding level of awareness among FPOs about climate change, and degree of willingness to take 'additional' measures to safeguard their business from climate risk. It may be noted that while most of the FPOs are still in the early phase of building their business, they are well aware of the risks that climate uncertainties can potentially bring to their business. Government agencies, financial institutions and private sector who are engaged in the process of strengthening capacities of FPOs need to leverage this as an opportunity to design their offer and support measures from climate perspective. The form and nature of these additional measures should not only consider region specific climatic variabilities but also need to be appropriately adjusted to existing capacities of FPOs.

Successful implementation of adaptation measures requires multiple stakeholders from relevant sectors to come together with a common objective of providing support for climate proofing of FPO value-chain. A thorough analysis of FPO business model, its feasibility and scaling up potential in the context of relevant agro-climatic zone will be vital to leverage public and private funds to finance additional adaptation measures. The CBBOs and other private stakeholders can play an important role in providing managerial, technical and interface support to the FPO. In this complex mosaic of actors, FPO as an institution has huge potential to inform 'knowledge generators', policy makers, and financing institution on side and to customize extension services to support smallholder farmers to promote climate resilient agro-business models.

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