

## Weathering the Storm: Farmer Resilience and Strategies for Crop Losses

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# **Weathering the Storm: Farmer Resilience and Strategies for Crop Losses**

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## *Executive summary*

# **Weathering the Storm: Farmer Resilience and Strategies for Crop Losses**

Agrarian distress in rainfed areas refers to the challenges faced by farmers who rely on rainfall for their agricultural activities. These areas are particularly vulnerable to climate change and variability, which can result in droughts, floods, and other extreme weather events that impact crop yields and livelihoods. One of the primary reasons for agrarian distress in rainfed areas is the lack of irrigation facilities. These areas rely on rainfall for their agricultural activities, and a lack of adequate rainfall can result in crop failure and financial losses for farmers. In addition, soil degradation and erosion, which can be caused by deforestation and unsustainable agricultural practices, can further reduce the productivity of rainfed areas. Furthermore, farmers in rainfed areas often face challenges in accessing credit and markets. They may also lack knowledge and resources and assets to adopt sustainable agricultural practices and diversify their income streams. This can result in a cycle of poverty and indebtedness, which leaves farmers struggling to make ends meet. Addressing agrarian distress in rainfed areas requires a comprehensive approach that includes improving irrigation facilities, promoting sustainable agricultural practices, providing access to credit and markets, and strengthening government support for farmers. This can help to improve agricultural productivity, enhance resilience to climate change, and promote sustainable livelihoods for farmers in rainfed areas. Government of India implementing crop insurance scheme to compensate for crop losses since last five decades in one form or other.

Crop insurance is a type of insurance policy that provides financial protection to farmers against losses caused by various risks associated with crop production, such as natural disasters, pests, diseases, and adverse weather conditions. It is designed to provide financial assistance to farmers who face crop losses due to unforeseen events beyond their control. In crop insurance, farmers pay a premium to an insurance company or a government agency, and in exchange, the insurer agrees to compensate the farmers for crop losses due to insured perils. The amount of compensation provided to farmers is based on the extent of the crop loss and the terms of the insurance policy. Crop insurance is an essential risk management tool for farmers as it provides a safety net against crop losses and helps them to manage their financial risks. It also enables farmers to invest more in agriculture as it is free from risks. Governments in many countries provide crop insurance to farmers as a part of their agricultural support policies. In India, the government provides crop insurance through the Pradhan Mantri Fasal Bima Yojana (PMFBY), which is aimed at ensuring the financial stability of farmers in the event of crop losses due to natural calamities, pests, and diseases. However, not all the states implementing PMFBY. For example, Karnataka is implementing PMFBY, while Andhra Pradesh is implementing its own YSR free crop insurance scheme and Telangana is not implementing any crop insurance scheme. Since, 2016, the PMFBY is implemented in different states, now it is time to assess the reach and benefits of the PMFBY in comparison to other crop insurance schemes like free crop insurance in Andhra Pradesh and no crop insurance in Telanagana and identify bottlenecks and hurdles in implementation and improve the scheme.

This was undertaken to study the status and risk profile of farmers and impact of different policy scenarios in three states namely Andhra Pradesh, Karnataka and Telangana. The study was conducted in year 2022 for the crop year 2020-21 and 2021-22. The 2020-21 is normal year with normal profits in major crops in all three states, while 2021-22 is bad year with on average crop loss of 30-35 percent. Especially chilli crop is damaged significantly in all three states. To understand the impact of the different crop insurance schemes, this study probed crop condition, losses and claims from insurance in both normal year and bad year. The study was conducted in three districts from each state, from each district two blocks, from each block four villages and from each village twenty farmers. The total sample comprises 1440 farmers equally from each state. The sampling framework is given below.

#### Sampling framework of the study

State	Type of crop	District	Block	Village	Farmer	Total
Andhra Pradesh	YSR Free Crop Insurance Scheme 2022	Guntur	2	4	20	160
		Krishna	2	4	20	160
		Prakasham	2	4	20	160
Telangana	No crop insurance	Khammam	2	4	20	160
		Mahabubabad	2	4	20	160
		Warangal (Rural)	2	4	20	160
Karnataka	PMFBY	Raichur	2	4	20	160
		Ballari	2	4	20	160
		Yadgir	2	4	20	160
		Total	18	36	180	1440

The major findings of the study are that, although government is helping farmers in many different ways, all these schemes are not responding to the natural calamities like droughts, pest and diseases losses. Farmers incomes decreased greatly during the bad year (2021-22) when compared to a normal year (2020-21). The indebtedness is increased significantly. No other government or private schemes are working to alleviate distress during the bad year except crop insurance schemes like PMFBY and YSR-free crop insurance.

However, the PMFBY faced several hurdles compared to YSR free crop insurance. It was observed that in Telangana with no crop insurance, farmers suffered huge financial losses and there is no institutional mechanism to support distressed farmers in the event of huge crop losses as happened in year 2021-22. Of the three states, YSR free crop insurance in Andhra Pradesh is effective and also efficient in providing timely claims to almost all the farmers who reported the crop loss. Some of the significant challenges in the implementation of crop insurance schemes in general and PMFBY in particular are:

**Loan waiver:** frequent announcement of loan waivers by some governments reduced incentives for payment of premium to crop insurance, as farmers expect that in case of crop failure government waive off loans.

**Compensation to crop damage:** Many state governments occasionally announce compensation to crop damage, which also reduce incentives for payment of premium to enroll in to crop insurance.

Low awareness and participation: Despite the government's efforts to promote PMFBY, many farmers are still not aware of the details of the scheme, and participation rates are relatively low. Lack of awareness about the benefits of crop insurance and inadequate outreach efforts are the primary reasons for low participation rates.

No claims even though crop loss: Many farmers complain about not getting any claims even though they reported huge crop loss.

Delay in claim settlement: Delay in claim settlement is another significant challenge in the implementation of PMFBY. Farmers often face delays in receiving compensation for crop losses, which can result in financial hardships for them.

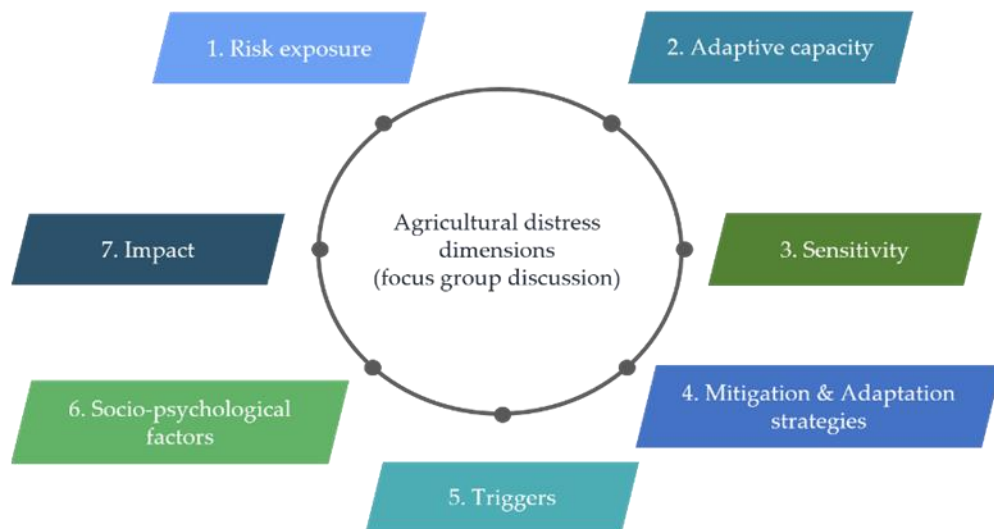
Inadequate coverage: PMFBY provides crop insurance only for a few select crops(which was compulsory for loanee crops), leaving many farmers/crops without any insurance coverage. Also, the coverage provided under the scheme is often inadequate, leaving farmers underinsured and exposed to financial risks.

Premium rates: The premium rates charged under PMFBY are low, but it requires considerable efforts by the farmers in enrolling, documentation and payment of premium at designated centres etc., which are cumbersome as most of the farmers are financially illiterate This has resulted in low participation rates and limited access to crop insurance.

Limited scope of benefits: The scheme does not cover losses due to factors such as market fluctuations, low prices, and post-harvest losses, which are major risks faced by farmers.

To address these challenges, the government needs to improve the implementation of PMFBY by increasing awareness among farmers, simplifying the enrolment, probably reducing the premium to zero, easy claim settlement process, providing adequate coverage for all crops, and expanding the scope of benefits to cover all risks faced by farmers. Improved implementation of the scheme can help to ensure financial stability for farmers and promote sustainable agricultural practices.

The study also developed a Farmers Distress Index which comprises seven pillars as mentioned in the below figure to track distress at farmers level and identify sub-districts (blocks) with severe distress for intervention.



*Regards*

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## *Chapter-1*

### *Introduction: Farmers distress*

#### **1. Introduction**

Agriculture and allied sectors are the largest livelihood provider in India and more so in the rural areas. However, with the structural shift in employment and income patterns from agriculture to non-agricultural sectors, the rural households are becoming more pluri-active that is in addition to agriculture they are engaged in non-agricultural activities like self-employment, casual labourer in non-agriculture and remittances from migration. Over the years, rural households' dependency on agriculture has declined to 50 per cent as per the latest round of the Periodic Labour Force Survey (PLFS) for 2018-19. However, still agriculture plays an important role in their livelihoods, incomes and employment. However, due to inherent dependence on nature, agricultural sector is exposed to many natural hazards like droughts, floods, pest and diseases attacks in addition to fluctuations in input and output prices. The agriculture sector in India is in severe crises and so are farmers of various states. The recent economic studies expressed serious concern about the declining share of the agricultural sector in India's Gross Domestic Product (GDP). The gap between incomes between farmers and non-farmers are increasing over the years, which is leading to many social anomalies in the society. Agrarian distress has become a subject of widespread discussion in recent years (Bhoi and Dadhich, 2019; Vasavi, 2009; Rao and Suri, 2006; Vasavi, 1999; Deshpande, 2002; Vyas, 2004; Posani, 2009; Chand et al., 201; Chand, 2012). Several reasons that have been put forward as the causes of agrarian distress is mounting debt of farmers, crop failures, declining yields, unviable farm holdings, increasing cost of production, fluctuations in output due to natural disasters like cyclones, floods, and droughts and prices of major crops have witnessed wild fluctuations in recent years after opening the Indian markets to international markets. Consequently, this has led to a high degree of instability in farm incomes. Reduction and wild fluctuations in agricultural incomes of the farmers has been manifested in the form of farmers' suicides.

In India nearly 45 per cent of farmers depends on rainfall without irrigation facilities. In rainfed areas farmer were highly exposed to droughts, delay in monsoon rains, dry spells during crop growing period on top of price fluctuations, which enhances the risks in their incomes. The erratic behavior of monsoon causes natural disasters such as drought, excess rain leading to floods, cyclones, rising temperature etc. Nearly two third of the cropped field is vulnerable to drought in different degrees in India. In this regard, to overcome this erratic behavior, agricultural risk management techniques are outmost importance particularly to small and marginal farmers in the country. Delay in arrival of monsoon delay sowing and sometime standing crop may be lost due to seed germination failures. Rainfall during flowering period



wash out the pollens which results in the adverse crop yield. Excess rainfall also adversely affects the yield as growing crops get submerged in the early stages. Beside this the floods interrupt the sowing schedule and damage the standing crops, resulting in reduced yield or even total loss of crops and reduced farm income. Other weather variables that affect yield are temperature, sunlight, winds and hails. This fluctuation severely impacts farmers' incomes and their living standards. They also effects countries production and export performance.

Although farmers follow traditional risk mitigation and adaption strategies over the years like inter-household barrowings, sharing resources and assets, sharing and exchanging food grains between them, adaption of soil and water conservation measures like constructing check dams, mixed or relay cropping, silvi-pasture and livestock rearing etc, the practice of these traditional risk mitigation and adaption strategies is reduced over the years due to advent of modern technologies, monocropping and commercialization of agriculture. Now, it is the responsibility of the government to enable macro-policy environment for development of alternative risk mitigation and adoption strategies to the farmers. In many countries government provide assistance to agricultural sector in the event of natural calamities such as compensation to crop loss and debt relief. Although compensation to crop loss and debt relief are good relief measures to reduce farmers distress in the short run, but they adversely affect the incentives to participation of farmers in crop insurance scheme. With wider belief that in case of crop loss, government will give compensation and announce debt relief, the farmers will not pay premium for crop insurance. Crop Insurance is the financial mechanism to minimize the impact of crop loss and stabilize farmers' incomes in the advent of crop loss. Crop insurance is a more effective institutionalized mechanism, under this, farmers can get relieved from the fear of crop loss and stabilize their farm income and guard against disastrous effect of losses due to natural calamities. Besides stabilizing the farm income, crop insurance helps the farmer to continue farming activities after a bad agricultural year. As such it is a risk management alternative where production risk is transferred to third party at a small cost called premium. Risk management, therefore, implies minimization of income loss either by reducing variations in output or ensuring certain minimum price or guaranteeing certain level of income. It is the process of appraising and reducing risk. Crop insurance also enhances expected returns from the farm and also incentivize farmers to take up larger investments in land and irrigation developments , thereby increase long term profitability. Over the years, different crop insurance schemes were implemented and time to time improved based on the experience by Government of India (GOI) to protect farmers from crop loss.

Compensation to crop loss, debt waiver, rescheduling of loans, crop insurance and purchasing output at Minimum Support Price (MSP) are the some of the agricultural risk mitigating tools introduced by the government of India over the years. Of which, crop insurance is the major risk

mitigation and adaption strategy in which government is taking proactive steps to improve and refine the scheme.

## **1.1 Background and Evolution of Crop Insurance Schemes in India.**

Crop insurance as a tool for risk management in agriculture has emerged in India in the beginning of twentieth century. From strategic policy to implementation, it has evolved gradually over the century and is still evolving in terms of scope, technology, methods and practices.

### **Pre independence Era**

In 1915, Shri J.S. Chakravarthi of Mysore State proposed a rain insurance scheme to cover farmers against drought based on the area approach. He published a book titled “Agriculture Insurance: A practical scheme suited to Indian conditions” in 1920, where he proposed this scheme. A few princely states like Madras, Dewas, and Baroda attempted to introduce crop insurance relief in various forms, but the scheme was not implemented by any of these States.

### **Post-independence Era**

After Independence, the Central Legislature discussed on Crop insurance and the then Minister of Food and Agriculture, Dr. Rajendra Prasad gave an assurance and a special study was initiated in the same year. Modalities of crop insurance considering Homogeneous Approach was proposed and circulated by Ministry of Agriculture to the state governments but all states rejected the scheme. In 1970, the GoI introduced a draft Crop Insurance Bill. A model scheme of crop insurance was referred to expert committee headed by Dr. Dharm Narain in order to enable the states to introduce crop insurance. Until 1972 the agriculture risk mitigation schemes were discussed and debated but were not implemented. After all these discussions, the General Insurance department of LIC introduced the first crop insurance program in 1972-73 on H-4 cotton in Gujarat and scheme covered other crops like groundnut, wheat and potato and it was extended to other states such as Maharashtra, Gujarat, Tamil Nadu, Andhra Pradesh, West Bengal and Karnataka. The scheme was implemented based on Individual Approach and operated till 1978-79 and General Insurance Corporation(GIC) realized that crop insurance programs based on Individual approach would not be financially feasible and sustainable.

Later on, crop insurance was implemented on pilot basis in 1979 by Prof. V. M. Dandekar, popularly referred to as the father of crop insurance in India, and he recommended that Homogeneous Area approach for crop insurance and accordingly GIC introduced a Pilot Crop Insurance Scheme (PCIS) covering oilseeds, cotton, cereals, millets, potato, gram and barley with effect from 1979, making participation by the state government as voluntary. The risk was

shared by the respective state government and GIC in the ratio of 1:2 respectively. The insurance premium was collected in the range of 5 to 10 percent of the Sum Insured (SI) and the scheme was executed till 1984-85. On 1st April, 1985, it was superseded by Comprehensive Crop Insurance Scheme (CCIS) with active participation of state government. The CCIS was based on homogeneous approach and it was linked with the short-term crop credit. Two Union Territories and 15 States participated in the scheme between 1985 to 1999 and the Scheme covered Rs. 7.63 crore farmers with a high claim ratio of 570.8 %. Hence CCIS was discontinued after Kharif 1999 and replaced by the improved National Agriculture Insurance Scheme (NAIS). Thereafter in 1999 the experimental crop insurance scheme was introduced in Rabi season where only 14 districts of 5 States participated. The modus operandi of the scheme was same as CCIS except that it was meant only for all small and marginal farmers with 100% subsidy given on Premium. The Premium subsidy and Claims were shared by the respective State and Central government in the ratio of 1:4 respectively.

Further in kharif season of 2000 seed crop insurance was implemented on pilot basis and covered 11 states to provide income stability and financial security only for the growers of seeds. The eligible farmers were only farmers growing the Foundation & Certified seed crops in the identified States, who were also registered with the concerned Certification Agency.

In 2003 to protect the farmers from fluctuation in price and yield and to reduce government expenditure on MSP, Farm Income Insurance Scheme (FIIS) was executed based on homogeneous area approach covering only rice and wheat crops. The scheme was made compulsory for loanee farmers and voluntary for non-loanee farmers. Claims arise only if the guaranteed income [measured based on average yield for past 7 years  $\times$  of indemnity (80% or 90%)  $\times$  MSP] was higher than actual income (measured based on current yield and current market price). The Scheme was implemented for Rabi 2003-04 season in 18 districts of 11 states for wheat and rice, and for Kharif 2004 season in 19 districts of 4 states for only paddy. The scheme covered 4.15 lakh farmers for an area of 4.02 lakh hectares.

In 1999-2000 Rabi season, the government sponsored National Agriculture Insurance Scheme (NAIS), which was implemented through Agriculture Insurance Company of India (AIC) Ltd. The scheme was available to all the farmers covering all the food crops (pulses, cereals and millets), oilseeds, commercial/horticultural crops. The premium rates varied between 1.5% to 3.5% depending on crop and the seasons covered. Small and marginal farmers were entitled for subsidy of 100% of the premium which was shared equally by Central and State Governments. The scheme operated based on 'Area Approach'. The scheme was implemented by 24 States and 2 Union Territories and has been replaced by Pradhan Mantri Fasal Bhima Yojana (PMFBY) from Kharif season of 2016.

**Modified National Agricultural Insurance Scheme (MNAIS)– 2010:** From Rabi season of 2010-11, MNAIS scheme was launched based on the recommendations of the joint group and comments from various stakeholders. The key improvements made in MNAIS are as followed:

- Actuarial premium with subsidy in premium ranging up to 75 per cent to all the farmers irrespective of land holding.
- Upfront subsidy on premium is shared by the central and state government on 1:1 basis and subsequently the claim liability was born only by insurance company.
- For all the major crops, unit area of insurance is village/ village panchayat level.
- Insurance can be claimed for prevented planting risk and for losses after harvesting due to cyclone in coastal areas.
- Up to 25% immediate payment is made on account of likely claims as immediate relief to the eligible farmers.
- Indemnity level increased to 70% instead of earlier 60%.
- Availing the scheme is voluntary for non-loanee farmers but compulsory for all loanee farmers.
- Allowed private sector insurers for creating competitive environment for crop insurance.
- Catastrophic fund is created at the national level by the central and the state government on 1:1 basis for providing protection to the insurance companies in case claim ratio is 500% or more at national level and if insurance companies fail to procure reinsurance cover at a competitive rate.

All the above-mentioned scheme of MNAIS was replaced by PradhanMantri Fasal Bhima Yojana (PMFBY) from Kharif 2016.

## **Pradhan Mantri Fasal Bima Yojana**

PMFBY is one of the world's largest crop insurance programs aimed at providing risk cover to Indian farmers from production vulnerabilities. It was launched in early 2016 with the key feature being a highly subsidized and affordable premium for farmers. Under PMFBY, farmers pay a very low premium of maximum 2% during Kharif sowing, 1.5% during Rabi sowing for food and oilseed crops, whereas for annual commercial crops they have to pay a maximum of 5%. The difference between actuarial premium rates and the farmer rates is shared equally between the central and the state governments. All farmers that avail of seasonal crop loans (loanee farmers) are by default expected to be included in the PMFBY scheme whereas other farmers can purchase the insurance voluntarily at similar net premium burden. Different types of important risks such as yield losses due to climatic factors, damages from pests and post-harvest losses, among others are covered under this scheme. The scheme is implemented on an 'area

approach' where insured unit is usually the village panchayat level for major crops. The Scheme shall be implemented through a multi-agency framework by selected insurance companies under the overall guidance & control of the Department of Agriculture, Cooperation & Farmers Welfare (DAC&FW), Ministry of Agriculture & Farmers Welfare (MoA&FW), GoI and the concerned State in co-ordination with various other agencies; viz financial institutions like commercial banks, co-operative banks, regional rural banks and their regulatory bodies, government departments viz. agriculture, co-operation, horticulture, statistics, revenue, information/science & technology, panchayati raj etc.

**The objectives of the scheme are**

- To provide insurance coverage and financial support to the farmers in the event of failure of any of the notified crop as a result of natural calamities, pests & diseases.
- To stabilize the income of farmers to ensure their continuance in farming.
- To encourage farmers to adopt innovative and modern agricultural practices.
- To ensure flow of credit to the agriculture sector.

**1.2. Risks to be covered and exclusions:**

**Risks:** Following risks leading to crop loss are to be covered under the scheme:-

**Yield losses** (standing crops, on notified area basis): Comprehensive risk insurance is provided to cover yield losses due to non-preventable risks, such as

- Natural Fire and Lightning
- Storm, Hailstorm, Cyclone, Typhoon, Tempest, Hurricane, Tornado etc.
- Flood, Inundation and Landslide
- Drought, Dry spells
- Pests/ Diseases etc.

**Prevented sowing (on notified area basis): -**

In cases where majority of the insured farmers of a notified area, having intent to sow/plant and incurred expenditure for the purpose, are prevented from sowing/planting the insured crop due to adverse weather conditions, shall be eligible for indemnity claims up to a maximum of 25 per cent of the sum-insured.

**Post-harvest Losses (individual farm basis):**

Coverage is available upto a maximum period of 14 days from harvesting for those crops which are kept in “cut & spread” condition to dry in the field after harvesting, against specific perils of cyclone / cyclonic rains, and unseasonal rains throughout the country.

**Localized Calamities (individual farm basis):** Loss or damage resulting from occurrence of identified localized risks including hailstorm, landslide, and inundation affecting isolated farms in the notified area.

**Exclusions:** Risks and Losses arising out of following perils shall be excluded: -

War and kindred perils, nuclear risks, riots, malicious damage, theft, act of enmity, grazed and/or destroyed by domestic and/or wild animals, In case of Post–Harvest losses the harvested crop bundled and heaped at a place before threshing, other preventable risks.

**Premium rates:**

The Actuarial Premium Rate (APR) would be charged under PMFBY by Implementing Agency (IA). DAC&FW/States will monitor the premium rates considering the basis of Loss Cost (LC) i.e. claims as % of sum insured (SI) observed in case of the notified crop(s) in notified unit area of insurance (whatsoever may be the level of unit area) during the preceding 10 similar crop seasons (Kharif / Rabi) and loading for the expenses towards management including capital cost and insurer’s margin and taking into account non-parametric risks and reduction in insurance unit size etc..

**Table 1.2.1. The rate of Insurance Charges payable by the farmer would be as followed:**

Season	Crops	Maximum Insurance charges payable by farmer (% of Sum Insured)
Kharif	Food & Oilseeds crops (all cereals, millets, & oilseeds, pulses)	2.0% of Sum Insured (SI) or Actuarial rate, whichever is less
Rabi	Food & Oilseeds crops (all cereals, millets, & oilseeds, pulses)	1.5% of SI or Actuarial rate, whichever is less
Kharif & Rabi	Annual Commercial / Annual Horticultural crops	5% of SI or Actuarial rate, whichever is less

The difference between premium rate and the rate of insurance charges payable by farmers shall be treated as rate of normal premium subsidy, which shall be shared equally by the Central and State government.

**1.3. Objectives of the Study**

Government of India has taken different interventions and implemented various schemes to protect farmers from agrarian distress like crop loss and farmers suicide, however there has not

been significant downfall in farmers distress and improvement in income of the farmers in India, here are some of the objectives of the study to find out what are the different risk mitigation strategies followed by farmers? And how PMFBY and other government schemes are helping farmers to cope with exposure to risks. The study was conducted in three states, namely Telangana (without crop insurance scheme), Andhra Pradesh (implementing zero premium crop insurance scheme) and Karnataka (implementing PMFBY), so that how the design and modalities and implementation of the crop insurance scheme will have an impact of risk mitigation strategies of the farmers. The specific objectives of the study are:

- ✓ To document predominant dry land farming systems and risk levels in crop production in Andhra Pradesh, Telangana and Karnataka.
- ✓ To elucidate farmers' perception regarding the various types of risks in different selected PMFBY clusters for identifying the appropriate mitigation and adoption strategies followed by farmers;
- ✓ To examine the various formal and informal institutional arrangements to alleviate farm distress;
- ✓ To prioritize various interventions (both formal and informal) with focus on PMFBY to address farm distress among different farming systems and socioeconomic groups.
- ✓ To develop sub-district level farmer distress index to measure degree of farm distress. Relating district wise coverage of farm distress to coverage under PMFBY and suggest policies to increase coverage.

## Chapter-2

### Data Collection and Research Methodology

#### 2.1. Methodology:

In year 2021, there was a huge damage, many farmers lost 100 per cent crop of chillies, lost to the extent of Rs.1, 20,000 per acre across three states namely Telangana, Andhra Pradesh and Karnataka. Keeping this in view, this study probe into how the farmers are able to cope with this huge crop loss and what are the adjustment mechanisms farmers followed and what were the impact on livelihoods of the farmers. (Figure 2.1). Another main advantage of selecting the three states is that these three states are having different institutional frameworks/policies for crop insurance, this is equivalent to natural Randomized Control Trials (RCTs). Karnataka state is implementing PMFBY, while Andhra Pradesh state is implementing its own crop insurance scheme named YSR Free Crop Insurance Scheme 2022 and Telangana state is not implementing any crop insurance scheme. The modalities and premium payments are different in Andhra Pradesh and Karnataka. Hence, in crop insurance policy perspective, there are three scenarios (i) No crop insurance (Telangana State); (ii) Implementing PMFBY (Karnataka); (iii) Implementing free crop insurance scheme (Andhra Pradesh). Given these different crop insurance scenarios, this study was undertaken to through light on which scheme/modalities are working better for farmers to alleviate farmer's distress.

#### 2.2. Sampling framework of the study

From each state, three districts, from each district two blocks from each block four villages were selected randomly. From each village twenty farmers were selected again randomly (Table 2.1 and Figure 2.3). From each state 480 farmers data was collected, together for three states total sample size was 1440. Primary data was collected from sample households using a structured questionnaire with open- and closed-ended questions in the crop year 2020. The data on cost of cultivation and other important variables were collected for two agricultural years, 2020 and 2021, so that yearly variation in production and incomes will be measured for normal and abnormal years. The study was undertaken at the farmer level to collect data on the seven dimensions of farmers' distress. In each village, census data were collected from government departments; then, twenty households were randomly selected in each village for an intensive survey.



**Table 2.1. Sampling framework of the study**

State	Type of crop insurance	District	Blocks	Villages	Farmers	Total farmers
Andhra Pradesh	YSR Free Crop Insurance Scheme 2022	Guntur	2	4	20	160
		Krishna	2	4	20	160
		Prakasham	2	4	20	160
Telangana	No crop insurance	Khammam	2	4	20	160
		Mahabubabad	2	4	20	160
		Warangal (Rural)	2	4	20	160
Karnataka	PMFBY	Raichur	2	4	20	160
		Ballari	2	4	20	160
		Yadgir	2	4	20	160
		Total	18	36	180	1440

The study used mixed methods both quantitative and exploratory to understand the procedures and processes and impact of different policy scenarios. This study is based on primary as well as secondary data. In addition to the primary survey, district level secondary data will also be used for the analysis.

### 2.3. Identification of Indicators

The indicators for farmers distress, coping, mitigation and adoption strategies of the farmers were collected through primary survey. The farmers' distress indicators were collated and screened through an extensive review of the published literature in peer-reviewed journals and based on focus group discussions with key informants (Suryanto and Rahman, 2019; Etwire et al., 2013; Dumenu and Takam, 2020; Adu et al., 2018; Jamir et al., 2013; Adeoti et al., 2016; Alhassan et al., 2019; Simane et al., 2016). The final questionnaire, which includes both open- and close-ended questions, was developed after discussion in focus group interactions regarding probable distress indicators and was pre-tested, refined based on feedback, and ultimately included only a handful of indicators (3-4 indicator for each pillar). The identification of the indicators was conducted through the particular process shown in Figure 1. The indicators used in this study were classified based on seven dimensions of vulnerability, which is an improvement over earlier studies. The seven dimensions were exposure to hazard, sensitivity, adaptive capacity, mitigation and adaptation strategies, triggers, socio-psychological aspects, and impacts.

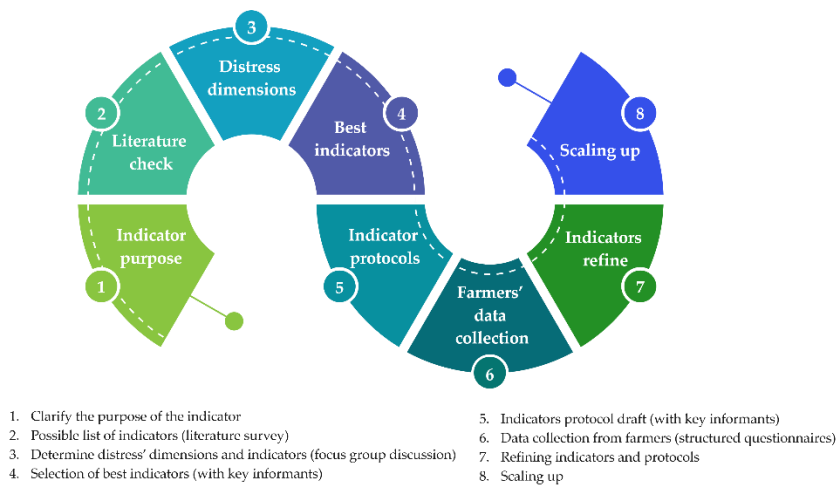


Figure 2.1. Indicator selection process.

In the previous literatures regarding agrarian distress, there are many references to vulnerability (Gallai et al., 2009; Karim et al., 1999; Vicuna et al., 2005; Nelson et al., 2005; Etwire et al., 2013; De Silva and Dayawansa, 2021; Khan et al., 2021; Chauhan et al., 2020). Although there are differences in definitions, all approaches to agricultural vulnerability broadly include exposure, sensitivity, and adaptive capacity (Rao et al., 2019). Here, exposure is defined as the nature and degree of a system's exposure to climatic variations, and sensitivity is the degree to which a system is affected, either adversely or beneficially, by exposure to drought or floods, for example. Adaptive capacity is crucial to modify exposure to risks, absorption, and recovering capacity from the losses stemming from exposure. Otherwise, adaptive capacity is defined as the propensity or predisposition to be adversely affected. Thus, to reduce vulnerability stress, it is essential to decrease sensitivity and strengthen the adaptive capacity of local communities. The adaptive capacity varies between different contexts and systems and is closely linked with infrastructural, institutional, community, social, political, demographic, economic, educational, health, technological, and cognitive factors.

Farmers follow both mitigation and adaptation strategies against exposure to hazards. Recent research studies highlights synergies between the mitigation and adaptation strategies followed by farmers (Klein et al., 2005). **Mitigation comprises all human activities aimed at reducing adverse events such as droughts and floods through the construction of check dams, percolation tanks, etc.** **Adaptation strategies refer to any adjustment performed by the farmers or farming community in response to exposure to hazards, such as droughts, to moderate harm or exploit beneficial opportunities (IPCC,2001).** Crop insurance is an important adaptation strategy followed by farmers, similarly debt waiver, compensation to crop losses are also important adaptation strategies which are led by central and state governments. This study considers both mitigation and adaptation strategies while measuring dimension of farmers' distress (Figure 2). A **trigger** event is an occurrence that causes severe distress, such as the failure of a bore well

after the investment of huge amounts of money in digging the bore well or complete failure of crop due to pests and diseases (Ebi et al., 2006). Social and psychological factors are significant provocations for extreme events such as farmer suicides. The impacts are the ultimate result of all the above indicators regarding farmers’ incomes, indebtedness, etc. The central focus of the FDI (Reddy, 2019) is to look into all dimensions of farmers’ distress and quantify each dimension (Ellis, 2000).

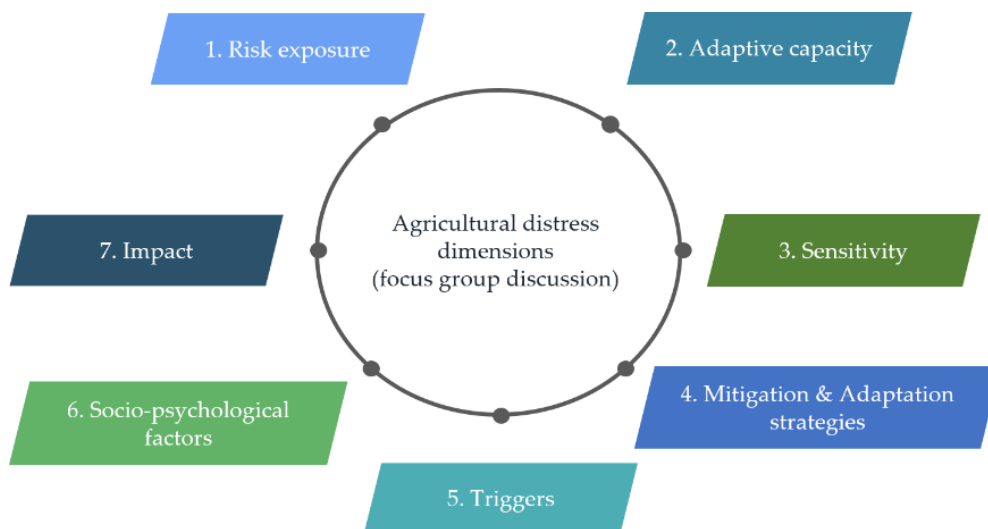


Figure 2.2. Major dimensions of agricultural distress.

#### 2.4. Screening of Variables for Final FDI

In this study, we aimed to identify and screen indicators of farmers’ distress to develop a composite Farmers Distress Index (FDI) to identify the sources, forms, and depth of vulnerability specific to the context to design resilience measures (Table 2.2). This method of parameters is a new approach to assess farmers’ vulnerability. Since the literature on farmers’ vulnerability is very limited in India, this index can help evaluate this issue at farmer level and also sub-regional level in the country (Rao et al., 2019).

Table 2.2. Systematic design of the research FDI (Farmers’ Distress Index)

Research Purposes	Analysis Tools	Data	Results
Identification of major indicators of farmers distress	Descriptive statistics using CREAM criteria	Primary data	FDI
Identification of geographies (sub-district level) with severe farmers’ distress	FDI scaling		Farmers’ vulnerability mapping

The study not only develops an FDI but also decomposes the index into seven dimensions. As a result of this attempt, the study recommends prioritizing the interventions to alleviate farm distress. Furthermore, by aggregating the FDI at the sub-district level, the paper presents a methodology to develop the FDI at the sub-district level to categorize high, medium, and low distress areas for prioritizing fund allocation, with more funds given to areas with a high FDI.

The study also assessed the different policy environments prevailing in the three study states namely Andhra Pradesh, Karnataka and Telangana and their overall impact on the welfare of the farmers. In this regard, multiple linear regressions will be run to understand the impact of different policy scenarios on FDI.

### 2.5. Selection and standardization of indicators

The data from all sample farmers were collected for 123 variables. However, while screening indicators, a modified version of the CREAM criteria (Castro, 2011) was used: the performance indicators should be Clear, Relevant, Economic, Adequate, and Monitorable (CREAM) (Saidani et al., 2019; Vaessen and Raimondo, 2012; Schiavo and Tommasi, 1999). The rating was conducted on a scale of 0 to 2, where “0” indicated a low score and “2” indicated a high score in the relevant performance criteria. The simple total score of all six criteria was used to select indicators (Table 2.3). The variables used for index development were tested for correlations with other variables at 95% confidence, and highly correlated variables were removed while calculating the FDI.

**Table 2.3. Rating of variables of indicators.**

Variables	Scores						Total Score	Selected Variables of Each Indicator with the Highest Score
	A	B	C	D	E	F		
Indicator								

*Note: A—Clear meaning; B—Data are easily available; C—Less effort in data collection, and the data do not require expert analysis; D—Sufficiently representative for the total of the intended results; E—Tangible and observable; F—Difficult to quantify but very important (proxy indicator).*

After screening all the indicators in all seven dimensions, out of 123 indicators, only 21 were included in calculating the composite FDI (details shown in Supplementary Table S1). Three indicators from each risk exposure, adaptive capacity, sensitivity, mitigation and adaptation strategies, triggers, social and psychological factors.

## 2.6. Tools and Techniques

The indicators were measured on different scales—e.g., some were numbers or percentages, and others were indices. Therefore, they were normalized to a range between 0 and 1 (Table 2.4). For indicators that decreased distress, the values were transformed so that the derived indicator had a positive association with FDI (e.g., 100 minus the indicator value in the case of percentage units).

**Table 2.4. Calculation of indices.**

<b>Standardization of indicator formula</b>	<b>Index<sub>sw</sub> = (S<sub>w</sub> - S<sub>min</sub>) / (S<sub>max</sub> - S<sub>min</sub>)</b>	Index Scale 0 = least vulnerable to 1 = most vulnerable
Major dimensions formula (7 dimensions)	$M_w = (\sum_{i=1}^n \text{Index}_{swi}) / n$	
Overall index formula (comprising 50 variables)	$\text{FDI} = (\sum_{i=1}^7 W_{mi} M_{wi}) / (\sum_{i=1}^7 W_{mi})$	

S<sub>w</sub> is the original indicator value for the household. S<sub>min</sub> and S<sub>max</sub> are the minimum and maximum values, respectively. M<sub>w</sub> is one of the major dimensions of the seven dimensions for measuring distress. Index<sub>swi</sub> is the indexed indicator for households. n is the number of indicators for each major component. W<sub>mi</sub> is the weight of each major dimension. M<sub>wi</sub> is the average value of each major dimension.

The distress level is scaled from least vulnerable, with a low index value, to most vulnerable, with the highest index value (Debesai, 2020). The indicators and their weights were assessed using multiple techniques such as expert opinion and literature review, regressing each variable with farmers' distress indicators, such as farmer indebtedness from informal sources (such as money lenders) with high interest rates. However, in this paper, we assigned equal weight to all the variables while constructing all seven dimensions of distress as this removes subjectivity and makes the index easy to upscale. The equal weighting was preferred because it made it easy to calculate the index for the administrators and implementers and to avoid pressures from political interests to engage in manipulation by changing weights arbitrarily for the inclusion of their political constituencies in high-priority lists to obtain more funding, for example, while scaling up the index across India.

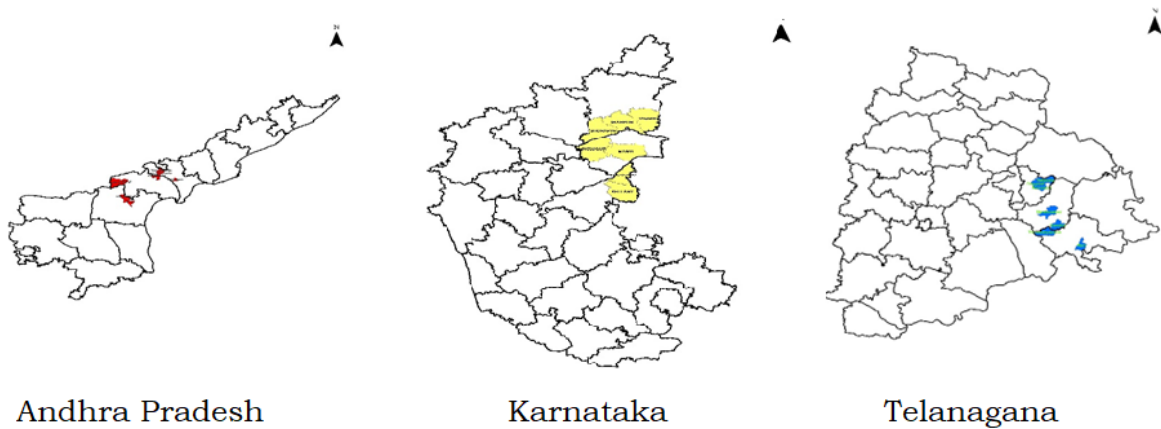
## 2.7. Robustness Check (Out-of-Sample Validation)

Testing the robustness of multidimensional composite indicators such as the FDI is critical for the developed indicator to be scalable across a wide variety of geographies and socioeconomic settings. Undeniably, 'traditional' or otherwise, robustness analysis in any form may act as a quality assurance tool. However, one of the first points stressed in the Organization for

Economic Co-operation and Development's(OECD) Handbook is that one cannot interpret an assessment of robustness to validate a 'sensible' index. Instead, it creates a sound theoretical framework that determines whether the index is sensible.

In this paper, FDI is mainly developed as an administrative tool to identify highly distressed farmers and sub-districts by using equal weightings for all seven dimensions. The robustness was checked for scalability across geographies and farmer groups. For this purpose, we constructed FDI for the twenty households who reported farmers' suicide and twenty well-off households in non-study areas (out-of-sample validation). The FDI was very high ( $>0.95$ ) for the former group, while it was significantly lower( $<0.50$ ) for the latter group at a 95% confidence interval, indicating the robustness of the FDI index.

Figure 2.3. Location of the study area (blocks)



## Chapter-3

### District level instability in area, production, yield and prices

#### 3.1. Introduction

Before going in to the analysis of primary data on farmers distress and vulnerability, coping and adaption strategies for risks, in this chapter we analysed the state and district level sources of risks for crop production. This will give a broader picture of risk in agriculture at district and state level. It is well known fact that weather, particularly rainfall, plays an important role in Indian agriculture since around 45 per cent of the cultivated area is dependent on rainfall and the dry land technology which is being developed in the research stations is yet to reach the fields on any significant scale (Mahendradev, 1987). The fluctuations in agricultural production and profitability also hinders capital investment by farmers and suppress the viability of agricultural sector and its potential to contribute economic growth. Most of the studies on Indian agriculture have looked at the instability in agricultural production at aggregate level and have focused only on production (Hazell, 1982; Dev, 1987; Sharma et al., 2006). The interest of researchers in instability analysis stems mainly from the fact that degree of vulnerability in production and profitability can be considerably reduced through technological intervention, infrastructure like irrigation, farm investments, choice of method of production, input use and management, post-harvest and market infrastructure and right set of policies.

In order to develop effective strategy to deal with instability and its effects there is a need to have a clear picture of degree of instability at various levels and how it moved over time (Raju et al., 2014). These studies suffer from two major limitations. One, they conceal the instability at disaggregate level when different parts forming the aggregate follow different distributions. Two, analysis of instability is restricted only to production and none of the studies have extended it to farm income; it is not seen whether fluctuations in prices aggravate instability in production or reduce it, to mitigate impact on farm income. Strategies to develop more appropriate risk management mechanisms require a better understanding of the nature and magnitude of risk at disaggregate level, and by including prices. This paper proposes to fill this gap. The chapter has estimated instability in major crops during green revolution, liberalization and post liberalization at the district level in Andhra Pradesh, Karnataka and Telangana. Further, the chapter has also assessed volatility in farm harvest prices and has probed whether price fluctuations reduce or increase instability in gross returns.

#### 3.2. Data and Methodology

The present study has applied time series data on area, production, yield and farm harvest prices (FHP) at the state and district levels for major crops that is, rice, groundnut, cotton and chickpea. The time series data were collected from International Crops Research Institute for

the Semi-Arid Tropics (ICRISAT) meso level data (<https://www.icrisat.org/tag/meso-level-data/>). Series on gross revenue (GR) from the selected crops were calculated by multiplying production with farm harvest prices of the corresponding years. The analysis has covered the period 1966-67 to 2017-18, which was divided into three sub-periods, viz. 1966-67 to 1980-81 (green revolution period), 1981-82 to 2000-01 (liberalization period) and 2001-02 to 2017-18 (post-liberalisation period). The main consideration behind dividing the total period of past 52 years into three sub-periods was to see whether instability in farm production and returns shows any changes with the policy changes.

Instability has been estimated for area, production, yield, farm harvest prices and gross returns for paddy, groundnut, cotton and chick pea. These four crops are major crops in all these states. The coverage of study could not be expanded to more crops due to limitation of data relating to farm harvest prices.

Instability associated with selected crops was estimated by using the following index:

$$\text{Instability Index} = \text{Standard Deviation of natural logarithm } (X_{t+1}/X_t) \dots\dots\dots (1)$$

Where,  $X_t$  refers to area (A), production (P), yield (Y), farm harvest price (FHP) or gross revenue (GR) in the year “t”; and  $X_{t+1}$  denotes these for the next year.

This index is unit free and robust and measures deviations from the underlying trend (log linear in this case). When there are no deviations from the trend, the ratio of  $X_{t+1}$  and  $X_t$  remains same and their standard deviation is zero. As deviation from the underlying trend increases, the standard deviation also increases. Slightly different variant of this index has been used in the literature before to examine instability and impact of drought on it (Ray, 1983; Rao et al., 1988).

### 3.3. Results and discussion

This paper has estimated the instability at state level and then has compared it with district level estimates to find dispersion and compare the change in instability over time, based on the state level data representing aggregates and district level data representing disaggregates.

#### Andhra Pradesh

Variability in agricultural production consists of variability in area and yield and their interactions. Variation in area under a crop occurs mainly in response to distribution, timeliness and variations in rainfall and other climatic factors, expected prices and availability of crop-specific inputs. All these factors also affect the variations in yield. Further, yield is also affected by outbreak of diseases, pests, and other natural or man-made hazards like floods, droughts, fire,



and many other factors. Different events may affect area and yield in the same, opposite or different way.

Instability in area, production and yield of rice, cotton, groundnut and chickpea experienced at the state level in Andhra Pradesh for a period 1966-67 to 1980-81, 1981-82 to 2000-01 and 2001-02 to 2017-18 are presented in Table 3.1. Instability index for area witnessed an increase after 2001-2017 for rice and decline in the case of cotton, groundnut of chick pea during liberalization period and later exhibited an increasing trend in post liberalization period. It increased from 14.2 to 25.2 in rice whereas in cotton, ground and chickpea in green revolution period 39.8, 23 and 37.4 later is shows a decreasing trend in liberalization period of 35.4, 16.4 and 30.6 then it showed increasing trend in post liberalization period of 40.2, 29.3 and 47.8. During these three periods, instability in area of rice showed an increasing trend compared to cotton, groundnut and chick pea because generally rice grown under irrigated conditions, demonstrated rather higher instability in area as compared to groundnut, cotton and chick pea. Further, area under cotton had shown more than double the fluctuations in area under groundnut.

**Table 3.1: Instability in area, production, yield, prices and gross revenue from important crops in Andhra Pradesh: 1866 1980, 1981-2000 and 2001-2017**

Crops	Periods	Area	Yield	Production	FHP	Gross returns
Paddy	1966-1980	14.2	21.5	28.5	17.3	24.7
	1981-2000	19.2	17.3	31.4	12.1	19.6
	2001-2017	25.2	17.9	34.4	13.8	21.4
Groundnut	1966-1980	23.0	27.0	38.0	27.7	35.5
	1981-2000	16.4	28.2	34.5	18.9	32.4
	2001-2017	29.3	36.9	48.7	16.6	37.7
Cotton	1966-1980	39.8	37.6	49.5	21.5	67.2
	1981-2000	35.4	37.0	43.4	21.2	52.0
	2001-2017	40.2	40.3	55.0	20.2	43.3
Chickpea	1966-1980	37.4	33.8	32.3	15.8	55.3
	1981-2000	30.6	32.8	43.7	16.2	50.3
	2001-2017	47.8	34.8	61.1	13.1	39.0

Red-high instability; Yellow-moderate instability; Green-low instability.

Over the years production instability increased and high for all crops in Andhra Pradesh. Whereas price instability was low, the net impact on instability of gross returns was reduced over the years. Instability was found lower in yield than area in the case of paddy and chickpea, whereas yields of groundnut and cotton showed much higher fluctuations than in area. The instability index of yield did not increase much over time in the case of paddy, whereas it shows an increasing trend in groundnut, cotton and chickpea, from 27 to 46.9, 37.6 to 40.3 and 33.8 to 34.8 between 1966- 1980 and 2001-2017. Despite lot of concern about susceptibility of cotton to

various pests in recent years, there is a reduced instability in gross returns from the crop as there is more reduction in instability in prices than the increase in instability in yields.

Instability in production of paddy was almost double than that in yield during the period 1981- 2000 and 2001-2017. In the case of cotton, deviations from trend growth were higher in production than yield and area during three periods. Volatility in production of groundnut increased after 1981-2000 and it was as high as 48.7 per cent in terms of standard deviation from trend. Whereas in chick pea during 1961-1980 instability in production was lower than area and yield, volatility in production was almost double in post liberalization period compare to green revolution period. Among the four crops, paddy production showed lowest year- to- year fluctuations compare to other three crops.

Beside fluctuations in production, prices received by the farmers for their farm produce are causing variations in farm income, but not a significant extent. But sometimes interaction between production and price is ultimately reducing income instability as that for paddy and groundnut, while in case of cotton in some years price instability is compounding the fluctuation in production and increasing instability in incomes as during the period 1966-2000. Therefore, it is important to consider interaction between fluctuations in production and prices to understand and address risk in farmers income. It is vital to point out that farm harvest prices indicated much lower fluctuations than those in yield and production. Second, instability in farm harvest prices showed a decline over time in the case of rice, groundnut, cotton and chickpea. Among all commodities price fluctuation in paddy is the lowest mainly due to procurement operations by government at Minimum Support Price (MSP). Among the four crops, farm harvest prices of paddy and chickpea showed the lowest instability, 13.8 and 13.1 per cent. The decline in price fluctuations in groundnut and cotton after 1980 seems to be the result of increased integration and improvements in agricultural markets in the country.

The reason for very less fluctuation in price instability of paddy also due to the result of liberalization of rice trade after 1990, which was earlier very tightly regulated by the government. Generally, prices and production are expected to have negative co-variance as increase in production puts downward pressure on price and a decrease in production should result in an increase in price in a closed economy. It is generally expected to have a smoothening effect on gross return from a crop. But this expectation is met if negative covariance in fluctuations between farm harvest prices and production exceeds the variance of either price or production. Although, price instability showed a decline in groundnut and cotton over time, it was very high in the case of ground nut. The net effect of fluctuations in production and prices on farm income represented by gross returns showed that instability in area, production, yield and prices did not negate each other. Rather, their impact got accumulated to some degree because of which instability in farm income was found higher than that in area, yield and prices

especially in cotton and chickpea up to the year 2000, but during the post-liberalization it decreased.

To understand whether instability in agriculture at the disaggregate district level presents a different picture than that at the aggregate level, instability in selected crops was estimated for each district in the state. Instead of presenting instability results for each district in Andhra Pradesh, these estimates have been presented in terms of range, frequency of decline and increase or no significant change between the three periods selected for the study in table 3.2. These results were then compared with those revealed by the aggregate data.

**Table 3.2: Range of instability in area, production, yield, prices and gross revenue at disaggregate level(Andhra Pradesh)**

Crops	Periods	Area	Production	Yield	FHP	Gross returns
<b>Paddy</b>	1966-1980	8.8 to 24.4	17.4 to 53.1	14.5 to 42	10.9 to 22.9	16.5 to 37.3
	1981-2000	6.7 to 43.8	13.8 to 59.8	10 to 31	1 to 20.4	12.8 to 32.7
	2001-2017	12.1 to 38.5	18.6 to 47.3	9 to 28.9	6.4 to 24.2	13.5 to 33.8
<b>Groundnut</b>	1966-1980	10.6 to 38.3	19.4 to 60.7	16.6 to 49.3	14 to 39.2	25.1 to 49.8
	1981-2000	10.3 to 25.3	16 to 66.3	14.5 to 60.4	12.7 to 40.7	13.6 to 66.3
	2001-2017	12 to 58.7	16.7 to 128.3	11.2 to 122	13 to 21.3	16 to 119.4
<b>Cotton</b>	1966-1980	0 to 98.7	0 to 121.1	0 to 82.9	17.7 to 40.6	42.1 to 95.1
	1981-2000	0 to 61.4	0 to 75.4	0 to 55.5	17.7 to 30	34.7 to 66.5
	2001-2017	19.5 to 72.3	29.2 to 82.3	24.6 to 76.5	15.5 to 27.3	24.5 to 76.4
<b>Chickpea</b>	1966-1980	0 to 66.3	0 to 78.3	0 to 84.9	13.1 to 31.7	32.2 to 94.2
	1981-2000	0 to 63.6	0 to 111	0 to 81.2	13.1 to 28.2	27.3 to 72.2
	2001-2017	0 to 106.7	0 to 102.8	0 to 100.6	6.3 to 16.4	20.3 to 96.2

A perusal of Table 3.2 revealed that there was not only a wide variation in instability across districts, in many cases the instability decreased at district level over the years for paddy and cotton. But for chickpea and groundnut instability in gross returns decreased from green revolution period to liberalization period, but post-liberalization period again instability increased. A similar pattern was observed in the case of production, yield and farm harvest prices. In some cases, instability shown by the state aggregate was found lower than the minimum value in the range of instability across districts. These results indicated that within the state, instability in agriculture production, prices and return at district level are cancelled out when we measure instability at aggregate level. These state level estimates provided indication of shock in supply or agriculture output at the aggregate level, but they completely concealed the volatility to which the sub-region was subjected. The district level instability estimates have shown that the range of instability in gross returns narrowed down for chickpea and cotton, but widened for paddy and groundnut during green revolution period and narrowed down during

liberalization period followed by widened during post liberalization period. Which shows that, during the post-liberalisation period, resource endowed districts reduced their instability, while resource poor districts are still vulnerable to high instability due to lack of irrigation, sub-optimal use of inputs and also under-investment in market infrastructure.

### **Telangana:**

Instability in agricultural production is the end result of variability in area and yield and their interactions. Fluctuation in area under a crop occurs mainly in response to distribution, timeliness and variations in rainfall and other climatic factors, expected prices and availability of crop-specific inputs. All these factors also affect the variations in yield. Further, yield is also affected by outbreak of diseases, pests, and other natural or man-made hazards like floods, droughts and fire and many other factors. Different events may affect area and yield in the same, opposite or different way. While fluctuations in price is affected by local to global market conditions, demand and supply conditions, quality of the produce, local market infrastructure etc.

Instability in area, production and yield of paddy, maize and cotton experienced at the state level in Telangana for a period 1966-67 to 1980-81, 1981-82 to 2000-01 and 2001-02 to 2017-18 are presented in 3.3. Instability index for area had exhibited an increasing trend during 2001-2017 for maize and paddy, but decline in the case of cotton. While during liberalization period instability in area, production and yield of paddy showed a decreasing trend but at the end it showed a growing trend in post liberalization period. It decreased from 31.3 to 25.5 during 1966-1980, then increased to 37.6 during 2001-2017 in paddy. During green-revolution period instability in areas was 31.3, 14.9 and 72.8 in paddy, maize and cotton. However, by post-liberalisation instability in area for paddy, maize and cotton stand at 37.6, 27.3 and 25.1 respectively. Over the years, instability in area of paddy and maize shows an increasing trend and cotton showed decreasing trend because generally rice grown under irrigated conditions and ultimately on monsoon rains, showed somewhat higher instability in area as compared to cotton. Area under cotton had shown more than triple the fluctuations in area under Maize during 1966-1980, but later on instability in cotton area was steeply reduced with the onset of Bt-cotton variety, increased area under irrigation.

### 3.3. Instability in Telangana

Crops	Periods	Area	Yield	Production	FHP	Gross returns
Paddy	1966-1980	31.3	30	54.5	15.9	45.0
	1981-2000	25.5	20.1	40.3	13.5	22.7
	2001-2017	37.6	18.2	50.3	23	53.2
Maize	1966-1980	14.9	37	42.6	31.9	58.6
	1981-2000	17.5	28.5	32.7	21.1	41.2
	2001-2017	27.3	37.3	50.0	20	45.1
Cotton	1966-1980	72.8	32.6	39.5	49.9	74.1
	1981-2000	44.5	46.4	56.6	83.4	151.2
	2001-2017	25.1	36.8	42.2	25.6	84.9

Moreover, instability was found lower in yield compared to area in the case of paddy, whereas yields of maize and cotton showed much higher fluctuations than in area. Further, the instability index of maize and cotton displayed an increasing trend in yield, while it showed a decreasing trend in case of paddy, and increasing trend in maize and cotton from 37.0 to 37.3 and 32.6 to 36.8 between 1966- 1980 and 2001-2017. In spite of lot of concern about susceptibility of cotton to various pests in recent years, its productivity had shown less fluctuation in these periods. Instability of cotton was high during liberalization period, however, later it decreased during post liberalization with spread of bt-cotton and irrigated area.

In case of paddy, in all three periods, instability index of rice production was twice that of the yield. This indicates that there was a positive interaction between area and yield instability, which may be due to that both area and yield are correlated (responding similarly) with other variables like irrigated area, rainfall, drought spells etc. In the case of cotton, deviations from trend growth were higher in production than yield and area during three periods. Volatility in production of maize increased after 1981-2000 and it was as high as 50 per cent in terms of standard deviation from trend. Whereas in cotton during 1981-2000 instability of production was higher than area and yield, volatility in production was almost twice in liberalization period compared to green revolution period. Among the three crops, instability in production of paddy was constantly higher, while for maize it increased, for cotton it significantly decreased.

Beside fluctuations in production, prices received by the farmers for their produce are equally important in causing variations in farm income. Farm harvest prices showed much lower fluctuations than production. Second, instability in farm harvest prices showed an increasing trend over time in the case of paddy, whereas it showed a decreased trend in maize and cotton. It indicates that the procurement operations of paddy at MSP may not be leading to reduced instability in prices, on the other hand, free markets in maize and cotton are contributing to

reduced instability in prices over the years. However, still in absolute terms fluctuations in paddy prices are low. Among the three crops, farm harvest prices of paddy showed the lowest instability, 13.5 per cent during 1981 to 2000. The decline in price fluctuations in maize and cotton after 2000 appeared to be the result of increased integration and improvements in agricultural markets in the country. The reason for very less fluctuation in price instability of rice seems to be the result of liberalization of rice trade after 1995, which was earlier very tightly regulated by the government. Generally, prices and production were expected to have negative co-variance as increase in production could put downward pressure on price and a decrease in production should have result in an increase in price in a closed economy setting. It was generally expected to have a smoothening effect on gross return from a crop. But this expectation was met if negative covariance in fluctuations between farm harvest prices and production exceeded the variance of either price or production. Although, price instability showed a decline in maize and cotton over time, it was very high in the case of cotton in absolute terms. The net effect of fluctuations in production and prices on farm income represented by gross returns showed that instability in area, production, yield and prices did not negate each other. Rather, their impact got accumulated to some degree because of which instability in farm income was found higher than that in area, yield and prices in all the cases, and it had not changed over time.

To see if instability in agriculture at the disaggregate level presents a different picture than that at the aggregate level, instability in selected dimensions were estimated for each district in the state. Rather than presenting instability results for each district in Telangana state, these estimates have been presented in terms of range, frequency of decline and increase or no significant change between the three periods selected for the study in table 3.4. These results were then compared with those revealed by the aggregate data.

**Table 3.4: Range of instability at district level in Telangana**

crops	Periods	Area	Production	Yield	FHP	Gross returns
Paddy	1966-1980	15.2 to 49.6	27.4 to 86.6	12.8 to 59.8	11.5 to 18.6	30.6 to 69.8
	1981-2000	16.9 to 41.2	24.8 to 58.2	10.1 to 39.8	8.4 to 23.9	16.8 to 38.3
	2001-2017	25.4 to 55.5	34.4 to 68.9	11.5 to 27.3	15.4 to 49.7	50.9 to 56.8
Maize	1966-1980	3.9 to 29.3	26.6 to 67.6	23 to 53	18.5 to 41.8	42.3 to 73.6
	1981-2000	3.9 to 45.6	16.1 to 58.0	12.4 to 47.7	14.8 to 25.5	28.1 to 60.9
	2001-2017	18.5 to 53.7	32 to 66.3	18.1 to 70.4	16.5 to 27.8	29.2 to 71.1
Cotton	1966-1980	7.9 to 140.2	0 to 104	0 to 88.6	24.4 to 55.9	52.4 to 109.6
	1981-2000	6.8 to 63.9	43.6 to 75.6	31.6 to 70.0	16.7 to 133	134.7 to 164.7
	2001-2017	14.9 to 37.5	23.7 to 60.5	20.5 to 46.3	17.9 to 72.2	76.7 to 94.6

A perusal of **Table 3.4** reveals that there is not only a wide variation in instability across districts, in some cases the range of instability at district level narrowed down, in contrast to the

increase at the state level. A similar pattern was observed in the case of production, yield, farm harvest price and gross returns. In some cases, instability shown by the state aggregate was found lower than the minimum value in the range of instability across districts. These results indicated that in a large state like Telangana, the state level estimates of risk involved in agriculture production, prices and return highly under estimate instability at the disaggregate level. These state-level estimates provided indication of shock in supply or agriculture output at the aggregate level, but they completely concealed the volatility to which the sub-region was subjected. The district level instability estimates had shown that the range of instability in gross returns narrowed down for cotton, but widened for rice and maize during green revolution period but narrowed down during liberalization period followed by widened during post liberalization period. The widening of instability during the post-liberalisation period compared to liberalisation period might be due to the widening disparities among agriculturally prosperous districts and less-endowed districts in terms of irrigated area, market infrastructure etc., so that the well-off districts reduced instability in production, while less-endowed regions are not picked up.

### **Karnataka:**

A difference in agricultural production consists of variability in area, yield and their interactions. Fluctuation in area under a crop occurred mainly in response to distribution, timeliness and variations in rainfall and other climatic factors, expected prices and availability of crop-specific inputs. All these factors also affected the variations in yield. Further, yield is also affected by outbreak of diseases, pests, and other natural or man-made hazards like floods, droughts and fire and many other factors. Different events may affect area and yield in the same, opposite or different way.

Instability in area, production and yield of paddy, sorghum and pigeon pea experienced at the state level in Karnataka for a period between 1966-67 to 1980-81, 1981-82 to 2000-01 and 2001-02 to 2017-18 had been presented in Table 4.5. Instability index for area had exhibited an increasing trend during 2001-2017 for all three crops. Whereas, during liberalization period instability of sorghum showed a decreasing trend but at the end it showed an increasing trend in post liberalization period. Instability in area of sorghum increased from 27.1 to 56.0 for sorghum from liberalization to post-liberalisation period. During these three periods, instability in area of paddy and pigeon pea showed less variation compared to sorghum because generally paddy grown under irrigated conditions, showed somewhat higher stability in area as compared to pigeon pea. Fluctuation in area under sorghum was more than twice that of paddy. Sorghum displayed a highest instability in area because it is completely rainfed, frequent droughts, floods, delay in onset of monsoons, low-input and low-output conditions and lack of technology and lack of awareness.

Instability was found lower in yield than area in the case of paddy, whereas yields of sorghum and pigeon pea showed much higher fluctuations than in area. The instability index of sorghum shows an increasing trend in yield, whereas it showed a decreasing trend in case of paddy and pigeon pea, in pigeon pea during liberalization period there was an increase in instability index to 58.2 per cent, but in the post-liberalisation period it displayed a decreasing trend of about 43.4 per cent. Despite lot of concern about pigeon pea to various pests and diseases in recent years, its productivity had shown less fluctuation in these periods. Instability of pigeon pea was high during liberalization period of about 58.2 per cent and later it decreased to 43.4 per cent during post liberalization period mainly due to the adoption of improved varieties and also use of inputs like fertilizers and micro-nutrients.

**Table 3.5: Instability in Karnataka**

Crops	Periods	Area	Yield	Production	FHP	Gross returns
Paddy	1966-1980	17.1	31.5	41.2	19.7	34.6
	1981-2000	20.0	23.7	35.4	15.3	26.0
	2001-2017	20.9	18.7	33.1	23.3	20.3
Sorghum	1966-1980	45.6	40.0	64.9	22.5	42.1
	1981-2000	27.1	34.5	47.7	26.1	44.3
	2001-2017	56.0	54.4	76.8	37.9	63.9
Pigeon pea	1966-1980	27.5	53.6	64.5	31.0	53.0
	1981-2000	30.8	58.2	67.0	31.1	61.1
	2001-2017	31.8	43.4	60.8	34.5	47.9

In case of paddy, instability index of production was almost twice than the yield. In the case of sorghum and pigeon pea, deviations from trend growth were higher in production than yield and area during three periods. Volatility in production of sorghum and pigeon pea increased after 1981-2000 and it was as high as 76.8 and 60.8 per cent in terms of standard deviation from trend. Whereas in sorghum and pigeon pea during 1981-2000 instability of production was higher than area and yield, volatility in production of pigeon pea was highest in liberalization period compare to green revolution period. Among the three crops, paddy production showed lowest year- to- year fluctuations compare to other crops.

Beside fluctuations in production, prices received by the farmers for their produce are equally important in causing variations in farm income. Farm harvest prices showed much lower fluctuations than those in yield and production. Second, instability in farm harvest prices showed an increasing trend over time in the case of sorghum and pigeon pea. Among the three crops, farm harvest prices of paddy showed the lowest instability, 15.3 per cent in liberalisation period.



The increase in price fluctuations in sorghum and pigeon pea after 2000 appeared to be the result of scattered and thin distribution of markets and under-development of global markets.

The reason for increase in price instability of paddy seemed to be the result of liberalization of rice trade after 1995, which was exposed to international price fluctuations. Generally, prices and production were projected to have negative co-variance as increase in production had put downward pressure on price and a decrease in production should have resulted in an increase in price. It was generally expected to have a smoothening effect on gross return from a crop. But this expectation could be met if negative covariance in fluctuations between farm harvest prices and production exceeded the variance of either price or production. The net effect of fluctuations in production and prices on farm income represented by gross returns showed that instability in area, production, yield and prices did not negate each other. Rather, their impact got accumulated to some degree because of which instability in farm income was found higher than that in area, yield and prices in all the cases, and it had not changed over time.

To examine whether instability in agriculture at the disaggregate level presents a different picture than that at the aggregate level, instability in selected dimensions was estimated for each district in the state. Rather than presenting instability results for each district in Andhra Pradesh, these estimates were presented in terms of range, frequency of decline and increase or no significant change between the three periods selected for the study are presented in Table 3.6. These results were then compared with those revealed by the aggregate data.

**Table 3.6. Range of instability at district level in Karnataka**

Crops	Periods	Area	Production	Yield	FHP	Gross returns
Paddy	1966-1980	1.1 to 48.7	13.8 to 74	15.3 to 46.5	12.4 to 27.6	20.6 to 49.6
	1981-2000	1.8 to 57.1	10.1 to 73.6	6.9 to 58.1	9.4 to 25.8	13.9 to 57.4
	2001-2017	2 to 60.1	7.2 to 75.8	6.9 to 57.7	11.9 to 40.1	11.1 to 56.6
Sorghum	1966-1980	7.4 to 128.9	30.3 to 102.3	19.5 to 58.7	17 to 32.5	23.4 to 58.3
	1981-2000	6.7 to 55.8	24 to 85.3	17.3 to 64	11.6 to 39.1	27.5 to 69.7
	2001-2017	9.6 to 311.3	29.4 to 284.5	26.2 to 224.7	14.6 to 246.8	32.2 to 226.2
Pigeon pea	1966-1980	8.8 to 62.3	45.7 to 90.2	31.4 to 86.4	25.9 to 43.5	36 to 88.8
	1981-2000	8.2 to 65.7	39.6 to 98.5	31.5 to 95	18.5 to 193.3	38.6 to 98.7
	2001-2017	7.9 to 51.4	45.3 to 89.2	26.3 to 60.2	27.2 to 46	26.2 to 61.2

An analysis of Table 4.3.2 revealed that there was not only a wide variation in instability across districts, in some cases the range of instability at district level narrowed down, in contrast to the

increase at the state level. A similar pattern was observed in the case of production, yield, farm harvest price and gross returns. In some cases, instability shown by the state aggregate was found lower than the minimum value in the range of instability across districts. These results indicated that in a large state like Karnataka, the state level estimates of risk involved in agriculture production, prices and return highly underestimate instability at the disaggregate level. These state-level estimates provided indication of shock in supply or agriculture output at the aggregate level, but they completely concealed the volatility to which the sub-region was subjected. The district level instability estimates have shown that the range of instability in gross returns narrowed down for paddy and pigeon pea, but widened for sorghum during post liberalization period.

## Chapter-4

### Basic characteristics and asset ownership of the sample households

Farmers in India are a diverse group with varying characteristics, depending on factors such as their geographical location, landholding size, and the crops they cultivate. Here are some general characteristics of farmers in India:

**Landholding:** Farmers in India own or operate farms of varying sizes, ranging from smallholder farmers with landholdings of less than 2 hectares to large farmers with landholdings of over 10 hectares.

**Income:** Farmers in India generally have low levels of income, with their livelihoods being dependent on the success of their crop yields. They often rely on subsistence farming, selling some of their produce in local markets, and government subsidies.

**Farming practices:** Farmers in India use a variety of farming practices, ranging from traditional to modern techniques. Many farmers still rely on family labor and traditional knowledge, while others have adopted modern farming equipment and technologies.

**Crops:** Farmers in India cultivate a wide variety of crops, including rice, wheat, pulses, fruits, and vegetables. The crops they cultivate often depend on factors such as the climate and soil type in their region.

**Access to resources:** Farmers in India often face challenges in accessing resources such as credit, markets, and government support. They may also face challenges in accessing inputs such as seeds, fertilizers, and pesticides.

**Climate change:** Farmers in India are particularly vulnerable to the impacts of climate change, such as droughts and floods, which can affect their crop yields and livelihoods.

**Gender:** Agriculture in India is often a family affair, with women playing a significant role in agricultural production. However, women farmers often face discrimination and lack of access to resources, which can impact their productivity and income levels.

Overall, farmers in India are an important part of the country's agricultural sector, and face numerous challenges in their agricultural practices and economic livelihoods. Addressing these challenges and supporting farmers is critical for sustainable and inclusive development of the agricultural sector in India.

Out of the total sample of 1440 households in three states, namely Andhra Pradesh, Karnataka and Telangana majority in all three states are Hindu (94.7%) households by religion followed by Muslims (3.7%) and Christians (1.6%) (Table 4.1). Share of Hindus are higher in Telangana

(97.2%) followed by Karnataka (94%) and Telangana (93.1%). The share of Hindu households is more among the sample households as the sample is collected from mainly who are directly dependent on agriculture as major source of income and who claims themselves as farmers. In general, share of farmers in Hindu religion is higher than both Muslim and Christians as the later group's engagement in non-agricultural activities, self-employment in non-agriculture are higher. Overall, in the sample share of forward caste households are higher with 40.9%, followed by Other Backward Caste (OBC) with 39.6%, Scheduled Tribe (10.3%) and least is for Scheduled Caste (9.2%). Probably, the sample is more biased towards landowners, hence the share of FCs and STs was higher than their actual share in the population, but they reflect that when compared to their share in population, FCs and STs representation in farming activities as cultivators is more. Again, there is some under representation of tenant farmers in the sample, although we try to incorporate tenant farmers in the sample, as many tenant farmers are not came forward for answering to our questionnaire probe due to the fear of landowners.

There are some slight inter-state differences in share of social groups, share of FCs was higher in Andhra Pradesh, while share of OBCs was higher in Telangana, share of STs was higher in Karnataka. The share of pakka houses in the sample households is 76.8%, highest in Andhra Pradesh (89.6%) followed by Telangana (73.9%) and Karnataka (70.3%). The reported tenancy was 5.1% in the overall sample, highest at 7.7% in Andhra Pradesh, followed by Karnataka (5.8%) and least in Telangana (1.5%). However, this reported tenancy is under estimation of prevalence of actual tenancy due to many reasons like fear from landowners not to disclose openly, informal nature of tenancy which is not legal in any respect and no written document to authenticate the tenancy. As per the poverty line, poverty levels in the study area are 33.2%, highest in Andhra Pradesh (39.1%) and lowest in Telangana (21.7%). However, these poverty numbers should not be generalised to the whole population of the respective states, as these districts are selected purposively and not represent whole states. We follow land size classification followed by Indian government with less than 1 acre as marginal farmers; 1-2 acre as small farmers, 2-4 acre as medium farmers, 4-10 acre as semi-large and more than 10 acres as large farmers. Marginal landholding farmers are more, and large landholders are less in Andhra Pradesh as against more large farmers and less marginal farmers in Karnataka. Overall, 13.9% are marginal landholders, 17.8% are small landholders, 32.1% are medium landholders, 29.0 % are semi-large and 7.1% are large landholders.

Among the states, as per the land capabilities, Andhra Pradesh lands are more fertile and can support more population per unit area, while Karnataka lands are less fertile and can support less population per unit area, the results seem to reflect the land capability to support households. Our field observations are also reflected these inter-state differences, however with some changes happened over the last two decades.

Our survey district in Andhra Pradesh are around Amaravati (Amaravati declared as state capital recently), where in land values have increased recently, but there is no commensurate development and non-farm opportunities for employment and income (McMorrow and Talip, 2001; Rigg, 2006). In Andhra Pradesh in some villages farmers are stuck up in old cropping pattern like rice-rice cultivation, which is not that profitable as that of commercial crops like cotton and chillies. On the other hand, farmers in Telangana are shifted to high-risk-high profitable cropping patterns like chillies and cotton, as a result their incomes from agriculture have increased, but with huge risk. In northern Karnataka, farmers are still practicing paddy and other diversified crops like jowar, millets, pulses and oilseeds, but their level of development in all respects are lower when compared to survey districts of Andhra Pradesh and Telangana. Their level of mechanisation and commercialisation is low in terms of tractorization and use of inputs like fertilizers and pesticides, cultivated area under commercial crops like cotton and chillies. Overall, the selected sample households cannot be interpreted as representative sample of the respective states, but can be treated as some case studies of farmers who are exposed to high level of hazard (more than 50% of the farmers in the study area reported crop loss due to thrips attack on chillies) in year 2021 but exposed to normal year in 2020. The design of the sample and selection of the sample households are purposeful, mainly to assess coping and adaptation strategies for exposure to high hazard in crop year 2021 when compared to normal year 2020.

## **Assets**

Physical assets play a crucial role in the success of agriculture and farmers. These assets refer to the tangible resources, such as machinery, equipment, buildings, and land, that are necessary for the production, storage and transportation of agricultural products.

1. **Machinery and Equipment:** Farmers rely heavily on machinery and equipment to cultivate, plant, harvest, and process crops and livestock. These tools can range from basic hand tools to complex machines such as tractors and irrigation systems. The proper and efficient use of machinery and equipment can significantly increase a farmer's productivity and profitability.
2. **Buildings:** Buildings are essential for the storage and processing of crops and livestock. They provide shelter for animals and protect crops from the elements. In addition, buildings such as barns, silos, and warehouses are used to store fertilizer, seed, and other supplies. They can also serve as workspaces for farmers and their employees.
3. **Land:** Land is the foundation of agriculture, and it is the most important physical asset for farmers. The quality and location of the land determine its potential for producing crops and livestock. Farmers must take care of their land to maintain its fertility and productivity over time. This includes practices such as soil conservation, crop rotation, and proper irrigation.
4. **Infrastructure:** Physical assets such as farm ponds and water systems are essential for the transportation of crops and livestock to market. These assets are critical for the economic viability of agriculture and the success of farmers.

**Table 4.1: Basic socio-economic status of sample households (% of households)**

	Andhra Pradesh	Karnataka	Telangana	All
<b>Religion</b>				
Hindu	93.1	94.0	97.2	94.7
Muslim	2.7	6.0	2.2	3.7
Cristian	4.2	0.0	0.7	1.6
<b>Social group</b>				
SC	9.8	11.5	6.3	9.2
ST	2.5	13.5	15.0	10.3
OBC	25.6	37.9	55.9	39.6
FC	62.1	37.1	22.8	40.9
<b>House type</b>				
Katcha	10.2	29.3	26.1	23.1
Pakka	89.6	70.3	73.9	76.8
<b>Tenancy</b>				
Owner	92.3	94.2	98.5	94.9
Tenant	7.7	5.8	1.5	5.1
<b>Poverty status(2020-21)</b>				
Non-Poor	57.7	64.8	78.3	66.8
Poor	42.3	35.2	21.7	33.2
<b>Land size</b>				
Marginal (<1 acre)	18.8	10.4	12.6	13.9
Small (1-2 acre)	17.1	14.8	21.7	17.8
Medium (2-4 acre)	29.6	27.9	39.1	32.1
Semi-large (4-10 acre)	28.3	34.0	24.6	29.0
Large (> 10 acre)	6.2	12.9	2.0	7.1
All	100.0	100.0	100.0	100.0

In conclusion, physical assets play a critical role in the success of agriculture and farmers. They provide the necessary resources for the production and distribution of crops and livestock and contribute to the overall economic viability of the agricultural sector. Farmers must carefully manage and maintain their physical assets to ensure their long-term productivity and profitability.

Households' socio-economic status is a multi-dimensional phenomenon is determined by a wide range of factors one of which is the non-equity in distribution and scarcity of assets in development opportunities (Kuang et al., 2020; Udoh et al., 2017; Jansen et al., 2017; Yang et al., 2018; Lindenberg, 2002). Physical, social, and natural assets have significant and positive effects on farmers' adoption of adaptation strategies in addition to human and financial assets. The basis for livelihoods in the villages are physical assets mainly land owned, different farm machinery like plough to tractors, travel facilities like bicycle, two wheelers and four wheelers and communication facilities like TV, radio, having smart phones etc., which may help in

updating farming technologies and infrastructure on the farm like farm ponds, storage house etc. which help in not only enhancing the farm productivity and also enhance resilience to droughts as well as floods. Even non-farm related assets like sewing machines can also increase resilience of farm-households. In this chapter, we explore ownership of different assets by different categories of households classified based on religion, social groups, landownership class, etc to get insights about the factors influencing the ownership of assets.

Physical assets available with households by religion groups.

Among the different religious groups ownership of assets is presented in Table 4.2. For Hindu respondents of total 1345 members, 96 per cent of had land with an average landholding size of 5.0 acres. Out of the total 52 Muslim respondents, 90 per cent had land with average holding of 5.0 acres and out of the total 23 Christian respondents, 87 per cent had land with average landholding size of 2.4 acre in the study area. While about 18 per cent of Hindu respondents had cattle shed, only 8 percent of Muslims group had cattle shed and 13 per cent among Christian population had cattle shed in the study area. It is also evident that majority of Hindu respondents owned Milk Cattle/ Buffalo (36 per cent), followed by Muslims (only 23 per cent) and only 22% among Christians. However, differences in ownership of sheep and goat are not significant, with only 5% of households owned sheep and only 2% owned goats. And only 9 per cent owned poultry and duck. Further, 93 percent of Hindus and 94 percent among Muslims and 91 per cent Christian were having 1 LPG cylinder connections on an average.

From the table 4.1 it is evident that 77% of the households from study area had smart phones with highest among Hindus (78%) and least among Christians (43% of households), but majority of Christian households had basic phones (91%), which indicates that majority of households had some sort of mobile phone connectivity, which can be a leading source of information and also a way to connect to the masses for enrolling them for different government schemes. Overall, 15% of households are owning tractors, it is slightly higher among Hindus. The table also showed the average ownership of different farm machinery and basic amenities of respondents from which it was clear that total machinery owned by Hindu households are higher than other two religions mainly due to their dependence on agriculture more than other two religions. It is also to be noted that, in the recent years, farmers dependence on the hired farm machinery, contractual pesticide sprayers is increasing with less emphasis on ownership of farm machinery. Government of India also encouraging custom hiring centres, which are supplemented by growing small scale entrepreneurs at village level lending their services like spraying pesticides and herbicides on per hectare basis and contractual weeding services, transplanting of paddy on per hectare basis are growing. In some villages, some private companies and foundations are setting up custom hiring centres and providing services on per hectare or per hour basis (Tayad and Jogdand, 2022; Mehta et al., 2019; Aryal et al., 2021; Pathak et al., 2020).

Ownership of lifestyle assets like TV (89% of households own), refrigerator (43% of households own), two-wheeler (77% of households) and four wheelers (3 percent) are also percolated into the rural households significantly in recent years. They have significantly improved the lifestyle and easy of living in the rural areas (Rönnlund, 2020, Vu et al., 2020).

**Table 4.2: Physical assets available with households by religion groups**

Religion	Hindu		Muslim		Christian		Total	
Number of farmers	1345		52		23		1420	
	Mean	%	Mean	%	Mean	%	Mean	%
Cultivated land (Acres)	5.0	96	5.0	90	2.4	87	5.0	96
Cattle shed/ Farmhouse (No.)	1.0	18	1.0	8	1.0	13	1.0	18
Farm Pond (no)	1.0	6	1.0	6		0	1.0	6
Storage house (No)	1.1	2		0		0		0
a. Working Cattle/ Buffalo (Agriculture)	2.0	21	2.2	8	4.5	9	2.0	20
b. Milk Cattle/ Buffalo	1.9	36	2.2	23	1.8	22	1.9	35
c. Young Stock	1.6	15	1.3	6	2.0	17	1.6	15
d. Sheep	10.4	5	3.7	6		0	10.1	5
e. Goats	8.0	2		0		0	8.0	2
f. Poultry & duck	8.1	9	3.8	8	3.7	13	7.9	9
g. Tractor/trolley	1.0	16	1.2	10	1.0	4	1.0	15
h. Power tiller	1.0	5		0	1.0	4	1.0	4
i. Bullock cart	1.0	9	1.0	4	1.0	4	1.0	9
j. Wooden/Iron Plough	1.0	25	1.0	27	1.0	13	1.0	24
k. Sprayer/duster	1.0	58	1.0	48	1.0	26	1.0	57
l. Weeder	1.0	14	1.0	17	1.0	9	1.0	14
m. Seed drill/hoes	1.0	8	1.0	6	1.0	9	1.0	8
a. Bicycle (Non-agriculture)	1.0	12	1.0	15	1.0	13	1.0	13
b. Auto Rickshaw	1.0	3	1.0	13		0	1.0	3
c. Two wheelers	1.0	77	1.1	73	1.0	57	1.0	77
d. Four wheelers	1.0	3	1.0	4		0	1.0	3
e. Sewing Machine	1.0	5	1.0	13	1.0	4	1.0	5
f. TV	1.0	89	1.0	87	1.0	87	1.0	89
g. Computer/Laptop	1.1	6	1.0	4	1.0	9	1.1	6
h. Refrigerator	1.0	43	1.0	31	1.0	30	1.0	43
i. LPG with Cooking set	1.0	93	1.0	94	1.0	96	1.0	93
j. Smart phone	1.1	78	1.1	69	1.0	43	1.1	77
k. Basic phone	1.0	66	1.1	65	1.0	91	1.0	66

### Physical assets available with households by social group

Further, Table 4.3 shows physical assets available with households by social group. From the table, it is apparent that the average landholding size among the sample households is 5 acre, with 96% of households owned agricultural land. Average size of landholding was higher among forward caste households (at 5.7 acre), while least among scheduled caste (3.1 acre). Especially SCs are having low level of asset ownership in all types of assets except small ruminants like sheep and goat and poultry. Ownership of Smart phones was high among general caste farmers (81% of households own smart phone) with average of 1.2 Smart phone ownership per household followed by OBC, ST and SC. Further the results indicate that more than 70 per cent of all caste farmers had smart phones with them which



revealed that irrespective of caste and religion groups, phones are accessible for all households, and which may be used as communication devise to disseminate information to farmers on new farm technology and government schemes (Sedai et al., 2021).

**Table 4.3: Physical assets available with households by social group**

Caste	SC		ST		OBC		FC		Total	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Number of farmers	131		146		562		581		1420	
Cultivated land (Acres)	3.1	91	4.0	97	5.0	95	5.7	97	5.0	96
Cattle shed/ Farmhouse (No.)	1	8	1.2	21	1.0	19	1.0	18	1.0	18
Farm Pond (no)	1	7	1.0	12	1.0	6	1.0	4	1.0	6
Storage house (No)	1	2	1	1	1	2	1.2	1	1.1	1
a. Working Cattle/ Buffalo (Agriculture)	2.4	12	1.9	36	1.9	23	2.1	15	2.0	20
b. Milk Cattle/ Buffalo	1.8	24	1.7	34	1.8	38	2.2	36	1.9	35
c. Young Stock	1.3	8	1.4	7	1.6	17	1.6	15	1.6	15
d. Sheep	6.6	5	13.0	14	10.5	5	4.0	1	10.1	5
e. Goats	4.5	3	2.5	7	12.8	3	2.0	0	8.0	2
f. Poultry & duck	9.14	11	9.9	24	7.0	9	6.4	5	7.9	9
g. Tractor/trolley	1.1	9	1.0	13	1.0	12	1.0	20	1.0	15
h. Power tiller	1	2	1.0	5	1.0	2	1.1	7	1.0	4
i. Bullock cart	1	5	1.0	11	1.0	12	1.0	7	1.0	9
j. Wooden/Iron Plough	1	18	1.0	26	1.0	30	1.0	20	1.0	24
k. Sprayer/duster	1.0	40	1.0	53	1.0	61	1.0	58	1.0	57
l. Weeder	1	6	1.0	12	1.0	19	1.0	12	1.0	14
m. Seed drill/hoes	1	6	1.0	5	1.0	8	1.0	10	1.0	8
a. Bicycle (Non-agriculture)	1	17	1.0	16	1.0	16	1.0	7	1.0	13
b. Auto Rickshaw	1	2	1.0	5	1.0	4	1.0	2	1.0	3
c. Two wheelers	1.0	57	1.0	65	1.0	81	1.1	80	1.0	77
d. Four wheelers	1	1	1.0	2	1.0	4	1.0	4	1.0	3
e. Sewing Machine	1	5	1.0	5	1.0	7	1.0	4	1.0	5
f. TV	1	85	1.0	79	1.0	90	1.0	92	1.0	89
g. Computer/Laptop	1.33	2	1.0	3	1.0	6	1.1	7	1.1	6
h. Refrigerator	1	21	1.0	34	1.0	43	1.0	49	1.0	43
i. LPG with Cooking set	1	91	1.0	92	1.0	93	1.0	95	1.0	93
j. Smart phone	1.1	71	1.2	73	1.1	75	1.2	81	1.1	77
k. Basic phone	1.0	68	1.0	64	1.0	63	1.0	70	1.0	66

### Physical assets owned by land size class.

Various assets ownership based on land size of farmers is shown in the table 4.4, it is apparent that in all three states large farmers own about 19.4 acres of land on average, followed by medium farmers (6.5acres), and

semi -medium (3.3acres). Small and marginal farmers owned 1.8 acres and 1.7 acres of land on average respectively, which are way less than large and medium farmers. Further, 56per cent of large farmers and 20per cent of medium farmers owned tractor which stands to be secondary source of income to them.

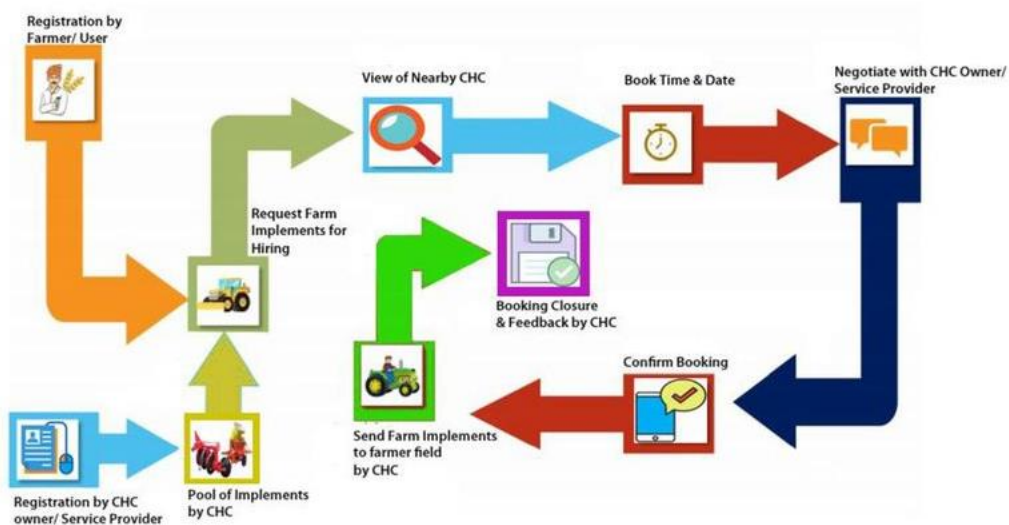
**Table 4.4: Physical assets owned by land size category**

Total wonland-2022	Marginal		Small		Semi-Medium		Medium		Large	
Number of farmers		199		255		457		408		101
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Cultivated land (Acres)	1.7	70	1.8	100	3.3	100	6.5	100	19.4	100
Cattle shed/ Farmhouse (No.)	1.0	8	1.1	11	1.0	18	1.0	25	1.0	26
Farm Pond (no)	1.0	5	1.0	4	1.0	6	1.0	9	1.0	5
Storage house (No)	1	2	1	1	1	1	1	1	1	2
a. Working Cattle/ Buffalo (Agriculture)	2	10	2	15	2	21	2	26	2	21
b. Milk Cattle/ Buffalo	2	25	2	27	2	38	2	40	3	47
c. Young Stock	1.6	10	1.4	9	1.4	14	1.5	18	2.3	22
d. Sheep	16.6	5	14.8	5	6.0	4	8.8	5	6.3	4
e. Goats	3.0	2	5.9	4	11.2	2	9.0	2		0
f. Poultry & duck	5.6	8	6.0	13	7.6	9	10.1	7	13.5	8
g. Tractor/trolley	1.0	5	1.1	10	1.0	10	1.0	20	1.0	56
h. Power tiller	1.0	2	1.0	2	1.0	3	1.0	4	1.1	23
i. Bullock cart	1.0	3	1.1	5	1.0	8	1.0	13	1.0	15
j. Wooden/Iron Plough	1.0	13	1.0	18	1.0	23	1.0	31	1.0	46
k. Sprayer/duster	1.0	37	1.0	47	1.0	52	1.0	73	1.0	81
l. Weeder	1.0	8	1.0	8	1.0	10	1.0	20	1.0	40
m. Seed drill/hoes	1.0	5	1.0	4	1.1	5	1.0	12	1.0	26
a. Bicycle (Non-agriculture)	1.0	12	1.0	14	1.0	15	1.0	11	1.1	7
b. Auto Rickshaw	1.0	5	1.0	2	1.0	3	1.0	3	1.0	3
c. Two wheelers	1.0	72	1.0	68	1.0	74	1.0	84	1.2	91
d. Four wheelers	1.0	2	1.0	2	1.1	2	1.0	4	1.0	15
e. Sewing Machine	1.0	4	1.0	4	1.0	5	1.0	7	1.0	9
f. TV	1.0	88	1.0	89	1.0	88	1.0	91	1.0	93
g. Computer/Laptop	1.0	5	1.0	2	1.0	5	1.1	8	1.1	12
h. Refrigerator	1.0	35	1.0	31	1.0	42	1.0	47	1.0	70
i. LPG with Cooking set	1.0	92	1.0	92	1.0	94	1.0	94	1.0	95
j. Smart phone	1.1	73	1.1	65	1.1	74	1.1	85	1.3	94
k. Basic phone		100		100		100		100		100

#### Physical assets owned by cultivated land group.

In the recent years, tenancy rate is increasing across India. Table 4.5 shows ownership by different according to cultivated land class, among total of 232 large farmers (based on cultivated

area), 95% owned land with an average size of land owned is 11.5 acres, whereas out of total 506 medium farmers, 95% owned land with an average owned land is 5.4 acres. Only about 3.1, 1.9 and 1.7 acres of land on an average was owned by semi medium, small, and marginal farmers respectively. In all land size (cultivation) groups about five per cent are not having owned land, it means about five per cent of cultivators are tenant farmers. Sheep and goat ownership was more among medium size landholdings cultivators. Ownership of tractors, dusters/sprayers, weeders, seed drills/hoes are much higher among large cultivators and very least among marginal cultivators. However, there is not much difference in ownership of LPG gas cylinder, smart phones, two wheelers, etc., which may be due to the gigantic changes seen in the last 2-3 decades of development in the rural India. Overall, it seems the spread of some non-agricultural technologies like smart phones, TVs, LPG gas cylinders and two-wheelers, etc., are rapid even among small and marginal farmers even in the remotest parts of India, as against this diffusion of agricultural technologies are not that fast, except in use of some improved varieties like Bt-cotton, improved varieties, fertilizers, and pesticides etc. Hence, we need a different type of institutional framework for covering the small and marginal farmers by improved farm implements like sprayers and dusters. The recently evolving Custom Hiring Centres (CHCs) are a good way forward for improving accessibility of farm implements among the small and marginal farmers. There are different location specific institutional frameworks which are in public-private-community participation, which can be upscaled for the benefit of small farmers (Kadaraian et al., 2022; Mehta et a., 2019; Sarkar, 2020; Aryal et al., 2019; Aryal et al., 2021). A basic model of Custom Hiring Centres (CHCs) is given in Figure 4.1.



**Figure 4.1: Digital platform for Custom Hiring Centres (CHC)**

**Table 4.5: Physical assets available with households by cultivated land category.**

Total cultivated land-2022	Marginal		Small		Semi-Medium		Medium		Large	
Number of farmers	80		195		407		506		232	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Cultivated land (Acres)	1.3	99	1.9	95	3.1	96	5.4	95	11.5	95
Cattle shed/ Farmhouse (No.)	1.0	8	1.2	9	1.0	14	1.0	21	1.0	29
Farm Pond (no)	1.0	6	1.0	4	1.0	7	1.0	7	1.0	5
Storage house (No)	1	3	1	1	1	2	1	1	1	2
a. Working Cattle/ Buffalo (Agriculture)	2	8	2	12	2	18	2	22	2	28
b. Milk Cattle/ Buffalo	2	25	2	17	2	33	2	38	3	51
c. Young Stock	1.9	9	1.4	5	1.3	12	1.5	17	1.8	24
d. Sheep	25.8	5	15.2	7	5.6	4	8.3	5	8.1	4
e. Goats	2.0	1	1.9	4	8.6	2	12.1	2	7.3	2
f. Poultry & duck	6.3	5	5.8	12	7.4	10	8.9	8	10.1	7
g. Tractor/trolley	1.0	1	1.0	6	1.1	5	1.0	14	1.0	48
h. Power tiller	1.0	1	1.0	1	1.0	2	1.0	3	1.1	15
i. Bullock cart	1.0	3	1.1	5	1.0	6	1.0	10	1.0	17
j. Wooden/Iron Plough	1.0	11	1.0	14	1.0	19	1.0	25	1.0	47
k. Sprayer/duster	1.0	33	1.0	39	1.0	45	1.0	67	1.0	78
l. Weeder	1.0	4	1.0	7	1.0	8	1.0	15	1.0	33
m. Seed drill/hoes	1.0	5	1.0	5	1.1	4	1.0	9	1.0	17
a. Bicycle (Non-agriculture)	1.0	13	1.0	16	1.0	16	1.0	11	1.1	6
b. Auto Rickshaw	1.0	6	1.0	3	1.0	3	1.0	3	1.0	3
c. Two wheelers	1.0	60	1.0	64	1.0	69	1.0	83	1.1	93
d. Four wheelers	1.0	3	1.0	1	1.1	2	1.0	3	1.0	10
e. Sewing Machine	1.0	6	1.0	4	1.0	5	1.0	6	1.0	8
f. TV	1.0	89	1.0	88	1.0	86	1.0	91	1.0	93
g. Computer/Laptop	1.0	6	1.0	3	1.1	4	1.0	6	1.1	10
h. Refrigerator	1.0	34	1.0	25	1.0	37	1.0	46	1.0	63
i. LPG with Cooking set	1.0	93	1.0	89	1.0	93	1.0	94	1.0	97
j. Smart phone	1.1	71	1.1	63	1.1	70	1.1	83	1.3	90
k. Basic phone										

**Ownership of physical assets by poverty status**

Physical asset holding either land or non-land assets or non-agricultural income generating assets play a key role in reducing poverty and increase any sort of natural hazards like attack of severe pests and diseases and droughts and floods (Wang et al., 2021; Moeis et al., 2020; Eichsteller et al., 2022). In 2020-21 among total of 1420 respondents 472 belonged to below poverty line (BPL), that is 33.2% are poor (Table 4.6). Further the result shows that average land holding of farmers who belonged to BPL was 3.9 acres, as against 5.6 acre for non-poor.

**Table 4.6: Ownership of assets by poverty status .**

	BPL21						BPL22					
	Non-Poor		Poor		Total		Non-Poor		Poor		Total	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Number of farmers		948		472		1420	0	755		665		1420
Cultivated land (Acres)	5.6	95	3.9	96	5.0	96	5.6	95	4.3	96	5.0	96
Cattle shed/ Farmhouse (No.)	1.0	20	1.0	14	1.0	18	1.0	19	1.0	16	1.0	18
Farm Pond (no)	1.0	6	1.0	6	1.0	6	1.0	5	1.0	7	1.0	6
Storage house (No)	1	1	1	2	1	1	1	1	1	2	1	1
a. Working Cattle/ Buffalo (Agriculture)	2	22	2	17	2	20	2	22	2	17	2	20
b. Milk Cattle/ Buffalo	2	39	2	32	2	35	2	39	2	32	2	35
c. Young Stock	1.6	15	1.5	13	1.6	15	1.7	15	1.4	14	1.6	15
d. Sheep	11.4	5	6.3	4	10.1	5	12.8	5	5.5	4	10.1	5
e. Goats	6.7	2	10.6	2	8.0	2	6.0	2	9.7	3	8.0	2
f. Poultry & duck	8.0	10	7.8	8	7.9	9	8.1	9	7.7	9	7.9	9
g. Tractor/trolley	1.0	18	1.1	9	1.0	15	1.0	19	1.0	11	1.0	15
h. Power tiller	1.0	6	1.0	1	1.0	4	1.0	6	1.0	2	1.0	4
i. Bullock cart	1.0	11	1.0	5	1.0	9	1.0	10	1.0	7	1.0	9
j. Wooden/Iron Plough	1.0	29	1.0	15	1.0	24	1.0	30	1.0	19	1.0	24
k. Sprayer/duster	1.0	63	1.0	44	1.0	57	1.0	61	1.0	52	1.0	57
l. Weeder	1.0	16	1.0	10	1.0	14	1.0	18	1.0	9	1.0	14
m. Seed drill/hoes	1.0	9	1.0	6	1.0	8	1.0	10	1.0	7	1.0	8
a. Bicycle (Non-agriculture)	1.0	13	1.0	13	1.0	13	1.0	12	1.0	13	1.0	13
b. Auto Rickshaw	1.0	4	1.0	2	1.0	3	1.0	5	1.0	2	1.0	3
c. Two wheelers	1.1	79	1.0	72	1.0	77	1.1	78	1.0	75	1.0	77
d. Four wheelers	1.0	3	1.0	3	1.0	3	1.0	4	1.1	3	1.0	3
e. Sewing Machine	1.0	6	1.0	4	1.0	5	1.0	6	1.0	5	1.0	5
f. TV	1.0	89	1.0	89	1.0	89	1.0	90	1.0	88	1.0	89
g. Computer/Laptop	1.1	7	1.1	3	1.1	6	1.1	7	1.0	4	1.1	6
h. Refrigerator	1.0	44	1.0	39	1.0	43	1.0	43	1.0	42	1.0	43
i. LPG with Cooking set	1.0	93	1.0	95	1.0	93	1.0	93	1.0	94	1.0	93
j. Smart phone	1.2	81	1.1	69	1.1	77	1.1	81	1.1	72	1.1	77
k. Basic phone		100		100		100		100		100		100

Among the sample farmers, 81 per cent of non-poor households were having smart phones, while only 69% of the poor are having smart phones. Further, during the year 2021-2022 the total number of respondents who belonged to BPL was 665 among 1420 farmers that is 46.8 percent are poor. Poverty increased by 13.6 per cent due to severe thrips attack on chilli and other crops.

It indicates that the severity of the thrips attack is impacted on farmers income significantly. A few households are having alternative non-agricultural income generating machinery like sewing machine (about 5 per cent of households; auto rickshaw 3 percent of households, four wheelers about 3 per cent of households).

### Ownership of assets by tenancy status

**Table 4.7. Ownership of assets by tenancy status (2020-21)**

	Owner-farmer		Pure tenant farmer		Total	
	Mean	N	Mean	N	Mean	N
Number of farmers	1348		72		1420	
Cultivated land (Acres)	5.0	100	4.7	17	5.0	96
Cattle shed/ Farmhouse (No.)	1.0	18	1.0	6	1.0	18
Farm Pond (no)	1.0	6	1.0	4	1.0	6
Storage house (No)	1	1	1	2	1	1
a. Working Cattle/ Buffalo (Agriculture)	2	22	2	17	2	20
b. Milk Cattle/ Buffalo	2	39	2	32	2	35
c. Young Stock	1.6	15	1.5	14	1.6	15
d. Sheep	10.0	5	12.7	4	10.1	5
e. Goats	8.3	2	3.5	3	8.0	2
f. Poultry & duck	8.0	9	3.8	6	7.9	9
g. Tractor/trolley	1.0	16	1.0	4	1.0	15
h. Power tiller	1.0	5	1.0	1	1.0	4
i. Bullock cart	1.0	9	1.0	6	1.0	9
j. Wooden/Iron Plough	1.0	25	1.0	11	1.0	24
k. Sprayer/duster	1.0	58	1.1	44	1.0	57
l. Weeder	1.0	14	1.0	14	1.0	14
m. Seed drill/hoes	1.0	8	1.0	6	1.0	8
a. Bicycle (Non-agriculture)	1.0	13	1.0	13	1.0	13
b. Auto Rickshaw	1.0	3	1.0	4	1.0	3
c. Two wheelers	1.0	76	1.1	82	1.0	77
d. Four wheelers	1.0	4	1.0	1	1.0	3
e. Sewing Machine	1.0	5	1.0	6	1.0	5
f. TV	1.0	89	1.0	90	1.0	89
g. Computer/Laptop	1.1	6	1.0	6	1.1	6
h. Refrigerator	1.0	43	1.0	36	1.0	43
i. LPG with Cooking set	1.0	93	1.0	94	1.0	93
j. Smart phone	1.1	77	1.1	76.4	1.1	77
k. Basic phone		100		100		100

Pure tenancy is a severe form of distressed farming condition. Pure tenancy refers to the legal relationship between a tenant and a landlord in which the tenant rents a property from the landlord for a specified period. In a pure tenancy, the tenant has exclusive possession and use of the property but does not have any ownership rights. The landlord retains ownership of the property and has a right to receive rent from the tenant in

exchange for allowing the tenant to use the property. This relationship is governed by the terms of the tenancy agreement, which sets out the rights and obligations of both the tenant and the landlord. However, in general in India, these are purely unwritten agreements. Basic amenities available with farmers based on pure tenancy are explained in the table 4.7 which reveals that among total of 1420 respondents 72 were pure tenant and 1340 were non-tenant. That is only 5% of the respondents are pure tenants in the sample. Further the result shows that average land holding of farmers who were pure tenants was 4.7 acre, while owner farmer it is 5 acres. Only a very few tenant farmers owning the modern and high capital-intensive machinery like tractors (4% of tenant's vs 16% among owner farmer) and power tillers (one percent among tenant farmers vs five percent among owner farmer). The similar trend is also visible among other small implements, but the difference is not significant. However, tenant farmers own more two-wheelers, auto-rickshaw, sewing machines than the owner-farmers, as they are source of employment from non-agricultural sector. It indicates that there is a tendency of tenant farmers to depend on not only agriculture but also move in and out to get employment in non-agricultural income sources (Bansal, 2020; Bhattacharya 2019; Baruah et al., 2022; Hossain et al., 2019).

### **Ownership of physical assets by irrigated and dryland farmers**

In general, irrigated farmers have more farm machinery, assets and other assets which complement high input agriculture in irrigated farms. In drylands, farmers generally invest less, as they expect less returns to investment (Lauer and Sanderson, 2000; Tiwari et al., 2019; Kuchimanchi et al., 2021). Among total of 1420 respondent farmers, 876 are dryland farmers (38.3% of the respondent farmers are dryland farmers without irrigation facilities). Average cultivated land was slightly higher among irrigated farmers than unirrigated farmers. More irrigated farmers have cattle sheds and farm ponds than dryland farmers. In general, irrigated farmers also have a greater number of farm-implements and machinery than non-irrigated farmers.

**Table 4.8: Ownership of physical assets owned by irrigated and unirrigated farmers (2021)**

	Dry Land farmers		Irrigated farmers		Total	
	Mean	N	Mean	N	Mean	N
Number of farmers	544		876		1420	
Cultivated land (Acres)	4.6	89	5.2	100	5.0	96
Cattle shed/ Farmhouse (No.)	1.0	13	1.0	20	1.0	18
Farm Pond (no)	1.0	3	1.0	8	1.0	6
Storage house (No)	1	1	1	2	1	1
a. Working Cattle/ Buffalo (Agriculture)	2	22	2	17	2	20
b. Milk Cattle/ Buffalo	2	39	2	32	2	35
c. Young Stock	1.4	13	1.6	16	1.6	15
d. Sheep	12.8	4	8.9	5	10.1	5
e. Goats	14.3	1	6.2	3	8.0	2
f. Poultry & duck	4.2	7	9.5	10	7.9	9
g. Tractor/trolley	1.0	14	1.0	16	1.0	15
h. Power tiller	1.0	4	1.1	4	1.0	4
i. Bullock cart	1.0	7	1.0	10	1.0	9
j. Wooden/Iron Plough	1.0	20	1.0	27	1.0	24
k. Sprayer/duster	1.0	49	1.0	62	1.0	57
l. Weeder	1.0	15	1.0	14	1.0	14
m. Seed drill/hoes	1.0	9	1.0	8	1.0	8
a. Bicycle (Non-agriculture)	1.0	8	1.0	15	1.0	13
b. Auto Rickshaw	1.0	2	1.0	4	1.0	3
c. Two wheelers	1.0	75	1.0	78	1.0	77
d. Four wheelers	1.0	2	1.0	4	1.0	3
e. Sewing Machine	1.0	5	1.0	6	1.0	5
f. TV	1.0	91	1.0	88	1.0	89
g. Computer/Laptop	1.1	4	1.1	7	1.1	6
h. Refrigerator	1.0	41	1.0	44	1.0	43
i. LPG with Cooking set	1.0	95	1.0	92	1.0	93
j. Smart phone	1.1	73	1.2	79	1.1	77
k. Basic phone		100		100		100



**Table 4.9: Ownership of assets of households by State**

State Name	Telangana		Karnataka		Andhra Pradesh		Total	
	Mean	N	Mean	N	Mean	N	Mean	N
Cultivated land (Acres)	3.6	99	6.8	95	4.6	94	5.0	96
Cattle shed/ Farmhouse (No.)	1.0	25	1.1	15	1.0	14	1.0	18
Farm Pond (no)	1.0	12	1.0	7	1.0	0	1.0	6
Storage house (No)	1.1	4	1.0	0	1.0	1	1.1	1
a. Working Cattle/ Buffalo (Agriculture)	1.9	26	2.1	27	2.0	7	2.0	20
b. Milk Cattle/ Buffalo	1.6	37	2.1	37	2.1	32	1.9	35
c. Young Stock	1.5	15	1.6	14	1.5	15	1.6	15
d. Sheep	9.8	4	10.9	9	4.0	1	10.1	5
e. Goats	2.9	3	5.0	2	23.3	1	8.0	2
f. Poultry & duck	8.5	15	11.8	5	3.8	7	7.9	9
g. Tractor/trolley	1.0	12	1.0	16	1.0	18	1.0	15
h. Power tiller	1.0	3	1.1	5	1.0	5	1.0	4
i. Bullock cart	1.0	10	1.0	13	1.0	4	1.0	9
j. Wooden/Iron Plough	1.0	29	1.0	27	1.0	18	1.0	24
k. Sprayer/duster	1.0	61	1.0	58	1.0	52	1.0	57
l. Weeder	1.0	8	1.0	25	1.0	9	1.0	14
m. Seed drill/hoes	1.1	2	1.0	16	1.0	7	1.0	8
a. Bicycle (Non-agriculture)	1.0	21	1.0	11	1.0	6	1.0	13
b. Auto Rickshaw	1.0	3	1.0	3	1.0	3	1.0	3
c. Two wheelers	1.0	77	1.1	76	1.0	78	1.0	77
d. Four wheelers	1.1	4	1.0	5	1.0	1	1.0	3
e. Sewing Machine	1.0	7	1.0	7	1.0	3	1.0	5
f. TV	1.0	89	1.0	84	1.0	95	1.0	89
g. Computer/Laptop	1.1	8	1.1	3	1.0	6	1.0	6
h. Refrigerator	1.0	52	1.0	32	1.0	44	1.0	43
i. LPG with Cooking set	1.0	90	1.0	93	1.0	97	1.0	93
j. Smart phone	1.1	73	1.2	84	1.1	73	1.1	77
k. Basic phone	1.0	52	1.0	62	1.0	85	1.0	66

Andhra Pradesh, Karnataka, and Telangana had slightly different agrotechnology and social background. On average, Karnataka farmers are having large landholdings, while Telangana farmers are having small landholdings. In terms of many asset classes (like cattle sheds, farm ponds, storage house, sprayers, dusters, working cattle and milk cattle), Telangana farmers are more resource endowed than both Karnataka and Andhra Pradesh farmers. This is basically due to the location of survey villages are situated in highly commercial chilli belt, wherein both costs and returns for agriculture are higher and farmers are using high input-high out put agriculture, but at the same time, these practices are highly risky as we have seen in year 2021, where in chilli farmers lost about Rs.1.25 lakh per acre due to heavy crop loss. However, In Karnataka a greater number of farmers having tractors, power tillers, weeders and seed drillers than Telangana, may be due to large landholdings. Otherwise, in lifestyle related assets like mobile phones, refrigerators there is no much difference between Telangana and Karnataka. Popularity of TV, LPG connections and tractors are much higher in Andhra Pradesh. It is also to be noted that in Andhra Pradesh state government agricultural development

schemes reach is much higher compared to Karnataka and Telangana due to the introduction of Rythu Barosa Kendras (RBKs) (Babu et al., 2021; Anuhya et al., 2022).

### Value of assets

The value of farm assets refers to the monetary worth of the tangible resources that a farmer owns and uses to produce, store and market agricultural products. These assets include land, machinery and equipment, farm buildings like cattle shed and storage house, and farm ponds. The value of these assets is determined by factors such as their age, condition, and market demand.

The value of farm assets can have a major impact on the financial stability and success of a farming operation. If a farmer has a high value of assets, it can provide them with a strong financial foundation and the ability to invest in the growth and expansion of their operation. On the other hand, if the value of their assets is low, it can limit their ability to access credit, make investments, and maintain operations.

Additionally, the value of farm assets is also a critical factor in determining a farmer's net worth. This, in turn, can impact their ability to secure loans and financing for their operation, as well as their ability to transfer the farm to the next generation.

The value of farm assets is a key factor in determining the financial stability and success of a farming operation. Managing and maintaining their assets to ensure their long-term value and to provide a strong foundation for their farming activities are one of the crucial determining factor for their resilience,

### Asset value by religion group

Among Hindu respondents nearly 99 per cent of respondents had residential house and valued on average of Rs.6,10,935(Table 4.10). Further 98 of Muslim respondents possessed residential house which is valued at Rs.5,00,980 and 96 per cent of Christian respondents had residential house which is valued at the current price is Rs.4,06,818. While about 96% of the Hindu respondents had cultivated land with present value was Rs.59,38,180, 90 per cent Muslim respondents in all three states had cultivated land which is valued Rs. 44,82,660 in current prices but only 87 per cent of Cristian households had ccultivated land with present value of Rs.27,22,500. The result of the study also shows that on average Hindu respondents' total assets value was Rs.63,57,354, Muslim households total assets value was Rs.46,15,010 and lastly Christian households had total assets worth of Rs. 28,94,565. In general, 90 per cent of the value of total assets are from land and remaining 10 per cent is mainly contributed by residential house, indicating very low investments on land development activities, farm buildings, farm ponds and storage warehouses. Less than 20% of households have cattle shed/farmhouse, only 5 per cent had farm pond and only one per cent had storage houses.

**Table 4.10 Religion wise assets value with households:**

Religion	Hindu		Muslim		Christian		Total	
	Mean	N	Mean	N	Mean	N	Mean	N
Residential house Present Value (Rs.)	610935	99	500980	98	406818	96	603743	99
Cultivated land Present Value (Rs.)	5938180	96	4482660	90	2722500	87	5840446	96
Cattle shed/ Farmhouse Present Value (Rs.)	51989	17	34833	6	41667	13	51641	17
Farm Pond Present Value (Rs.)	77183	5	47000	6		0	75959	5
Storage house Present Value (Rs.)	229765	1		0		0	229765	1
Total Assets(value)	63,57,354	100	46,15,010	100	28,94,565	100	62,37,462	100

Note: N= percent of households having an asset.

### Asset value by social group

In India, the ownership and control of agricultural assets have been historically influenced by the caste system. The caste system, which is a social and economic hierarchy based on birth, has resulted in unequal access to resources and opportunities for different castes, including agricultural assets.

Traditionally, members of higher castes have had greater access to land, capital, and other resources, while members of lower castes have been excluded from owning or controlling significant agricultural assets. This has contributed to a persistent pattern of economic and social inequality in the Indian agriculture sector.

However, in recent years, there have been efforts to address these inequalities and increase access to agricultural assets for marginalized communities. Government programs, such as land reform initiatives and affirmative action policies, have aimed to increase the ownership and control of agricultural assets by members of lower castes.

In addition, non-government organizations and civil society groups are working to promote equitable access to agricultural assets through education, training, and the provision of financial services and resources. These efforts aim to provide marginalized communities with the tools and resources they need to increase their ownership and control of agricultural assets and build more sustainable and resilient agricultural operations.

Table 4.11 shows social group wise assets owned and their value. From the table it is evident that residential house present value among FCs was highest with Rs.6,38,591 and lowest for SCs with Rs.4,32,326. While value of cultivated land was the highest among OBCs with Rs.67,20,244 and lowest was among SCs at Rs.28,15,042. Further it is seen in the data that total asset value was highest among OBC group with Rs. 70,16,343 followed by FC respondents valued at Rs. 67,73,009 and least among SC respondents with Rs.30,19,756. (Tewathia et al., 2020; Pretty et al., 2020; Blakeslee et al., 2020). The caste system has had a significant impact on the ownership and control of agricultural assets in India. While progress has been made to address these inequalities, much work remains to be done to ensure equitable access to these critical resources for all members of Indian society.

**Table 4.11: Social group wise assets value with households**

Caste	SC		ST		OBC		FC		Total	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Residential house value (Rs.)	432326	98	580308	100	613664	99	638591	99	603743	99
Number of rooms (no)	3	98	3	100	3	99	3	99	3	99
Cultivated land value (Rs.)	2815042	91	3490352	97	6720244	95	6239034	97	5840446	96
Cattle shed/ Farmhouse value (Rs.)	28182	8	70846	18	54250	18	46620	17	51641	17
Farm Pond value (Rs.)	41625	6	72000	10	54778	5	112040	4	75959	5
Storage house value (Rs.)	11667	2	100000	1	321375	1	240000	1	229765	1
Total Assets(value)	3019756	100	3995240	100	7016343	100	6773009	100	6237462	100

### **Asset value by own land size category**

In India, the asset value and land size of a household are significant indicators of its economic status and can vary widely among different classes in rural villages. In general, larger landholdings are associated with higher levels of assets and higher economic status and greater access to further resources and opportunities like access to credit, crop insurance.

Small and marginal farmers, who often belong to lower castes or economically marginalized communities, typically have limited access to land and other resources, resulting in lower levels of assets and lower economic status. On the other hand, larger and more affluent farmers, who are often members of higher castes or more economically privileged communities, tend to have larger landholdings and higher levels of assets, providing them with greater economic stability and access to resources and opportunities.

However, there is significant variation within each land class, and some small and marginal farmers may have relatively high levels of assets, while some larger and more affluent farmers may have relatively low levels of assets. Additionally, the distribution of assets and landholdings can vary widely across different regions and villages in India.

Ownership of various assets among different land size category farmers is presented in the table 4.12. The total asset value ranged from Rs. 252,34,752 among large farmers to Rs.18,08,920 among marginal farmers. In this as reported land and residential house values are as high as 90% of total asset value. It is seen that large farmer's residential house value is as high as Rs. 8,34,653 and cultivate land value was highest with Rs. 243,67,228. While among marginal farmers residential house value is Rs.5,77,026 and land value is Rs.17,10,357. As earlier mentioned even among the large farmers, the asset value of cattle shed, farmhouse, farm ponds are limited and vary few farmers having them on their farms. The asset value is a significant indicator of its economic status in rural villages in India. The distribution of assets is highly correlated with land size class, and efforts to promote equitable access to assets and resources will increase opportunities and ensuring sustainable and inclusive economic growth in the agriculture sector.

**Table 4.12 Own land size wise assets value with households**

Variable	Marginal		Small		Semi-Medium		Medium		Large		Total	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Residential house value (Rs.)	577026	98	514683	99	580586	99	640371	99	834653	100	603743	99
Number of rooms (no)	3	98	3	99	3	99	3	99	4	100	3	99
Cultivated land value (Rs.)	1710357	70	2196059	100	3892615	100	7124447	100	24367228	100	5840446	96
Cattle shed/ Farmhouse value (Rs.)	37308	7	65346	10	44083	17	55761	23	52885	26	51641	17
Farm pond value Rs.)	37857	4	86111	4	67773	5	89355	8	64000	5	75959	5
Storage house Present Value (Rs.)	52500	1	1007500	1	66200	1	138333	1	312500	2	229765	1
Total Assets(value)	1808920	100	2773075	100	4501697	100	7804170	100	25234752	100	6237462	100

#### **Asset value by total cultivated land size category**

Asset value by land size class based on cultivated area was given in table 4.13. It is evident from the table that residential house value of large farmers was highest with Rs. 7,07,013. The next highest residential house value was for medium farmers with Rs. 6,46,687 but only 98 per cent have own house. Moreover, large size farmers also had land with highest value of Rs. 1,38,32,308 but only 95 per cent of them have own land. However, large farmers total assets worth was also highest with Rs.139,42,931 in comparison to medium, semi medium, small, and marginal farmers. It indicates that a few of the large cultivators are on tenant basis with almost no value on land assets, which be alarming without institutional supports like credit, crop insurance and input subsidies, loan waivers, crop loss compensation.

**Table 4.13: Total cultivated land size wise assets value with households:**

Assets	Marginal		Small		Semi-Medium		Medium		Large		Total	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Residential house value (Rs.)	5,88,718	98	4,51,179	100	5,68,704	100	6,46,687	98	7,07,013	100	6,03,743	99
Number of rooms (no)	3	98	2	100	3	100	3	98	3	100	3	99
Cultivated land value (Rs.)	15,04,430	99	20,96,478	95	34,58,256	96	62,59,066	95	1,38,32,308	95	58,40,446	96
Cattle shed/ Farmhouse value (Rs.)	18,000	6	44,857	7	51,047	13	54,624	19	51,721	29	51,641	17
Farm pond value (Rs.)	40,600	6	84,167	3	72,182	5	80,733	6	82,091	5	75,959	5
Storage house value (Rs.)	52,500	3	15,000	1	66,200	1	5,56,250	1	2,46,000	2	2,29,765	1
Total assets(value)	20,74,600	100	24,86,528	100	39,30,269	100	66,63,983	100	1,39,42,931	100	62,37,462	100

### Asset value by poverty status

There is a strong association between the value of assets and poverty in rural India. Households with lower levels of assets are more likely to be living in poverty, while households with higher levels of assets are more likely to be economically secure.

In rural India, many households rely on agriculture as their primary source of income, hence there is strong association between ownership of assets and income-poverty status. The value of assets, including land, livestock, and machinery, directly affects the ability of these households to produce and sell crops, earn an income, and meet their basic needs. Households with higher levels of assets have greater capacity to invest in their agricultural operations, access credit and financing, and increase their income-generating potential and get out of poverty.

On the other hand, households with limited assets are often unable to invest in agriculture and non-agricultural income generation activities and are more vulnerable to economic shocks and downturns. They may also have limited access to credit and financing, which can further limit their ability to increase their income and escape poverty.

Additionally, the unequal distribution of assets in rural India, often influenced by factors such as caste and gender, can further exacerbate poverty and inequality. The lack of access to assets and resources by marginalized communities can create a cycle of poverty, in which they are unable to break out of poverty due to limited economic opportunities and insufficient assets.

Table 4.14 shows association between poverty status and value of assets in year 2020 and 2021. The result of the study shows that in 2020 total value of assets of households is Rs.62,37,462, which was increased to Rs. 62,37,462 in year 2021 even though in year 2021 majority of the farmers experienced crop loss. Even among the poor the asset value was increased from Rs.46,80,761 to Rs.52,50,962. It indicates that the assets particularly land and residential house play a crucial role in stabilizing the economic status even in the event of hazards like huge crop loss in the villages.

In conclusion, the value of assets is a critical factor in determining poverty and economic stability and increasing resilience against natural calamities such as droughts/floods and huge crop losses in rural India. Addressing the unequal distribution of assets and promoting equitable access to resources is essential for reducing poverty and promoting sustainable economic growth and resilience to climate change in the agriculture sector.

**Table 4.14: Value of assets and poverty status of households**

Total Assets(value)	Year 2020						Year 2022					
	Non-poor		Poor		Total		Non-poor		Poor		Total	
Assets	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Residential house value (Rs.)	6,51,503	99	5,07,607	99	6,03,743	99	6,22,644	99	5,82,375	99	6,03,743	99
Number of rooms (no)	3	99	3	99	3	99	3	99	3	99	3	99
Cultivated land value (Rs.)	66,43,468	95	42,41,476	96	58,40,446	96	67,84,451	95	47,78,255	96	58,40,446	96
Cattle shed/ Farmhouse value (Rs.)	53,736	18	45,857	13	51,641	17	52,332	18	50,695	15	51,641	17
Farm pond value (Rs.)	78,308	5	70,409	5	75,959	5	91,394	4	63,537	6	75,959	5
Storage house value (Rs.)	3,65,000	1	36,571	1	2,29,765	1	1,97,286	1	2,52,500	2	2,29,765	1
Total assets(value)	70,12,528	10	46,80,761	10	62,37,462	10	71,06,366	10	52,50,962	10	62,37,462	10

Note: N= per cent of households owning the asset

### Asset value by tenant status

Tenant farmers are individuals or families who rent agricultural land from a landlord to grow crops or raise livestock. The value of their assets refers to the worth of the items they own, such as machinery, equipment, buildings, livestock, and crops.

The value of assets is important for tenant farmers because it affects their ability to secure loans, invest in their operations, and generate income. The more assets a tenant farmer has, the more collateral they can offer to secure loans, which allows them to make investments that can improve the productivity of their operation and increase their income.

However, the value of assets can also be a source of vulnerability for tenant farmers, as it is subject to market fluctuations and changes in the agricultural economy. For example, a decline in crop prices can result in a decrease in the value of a tenant farmer's crops and land, making it more difficult for them to secure loans and investments.

Value of assets of households by land tenancy status (owner-cultivator and tenant-cultivator) was given in Table 4.15. about three per cent of tenant farmers don't have own house and only 18 per cent of tenant farmers have own agricultural land among the pure tenants. For this 18% of tenant farmers who possess some owned land, the value is Rs.35,80,769, while remaining 82 per cent of the tenant farmers don't possess any agricultural land. As a result total assets possessed by tenant farmers were significantly lower (Rs.12,78,542) than the owner-farmer (Rs. 65,02,330). Overall, the value of assets is an important consideration for tenant farmers as they seek to maintain and improve their financial stability and success in agriculture. Their productive capacity is limited by lack of owned land as most of the government agricultural development schemes like agricultural credit and crop insurance are tied to the landownership.

**Table 4.15 Pure Tenant wise Total assets value with households**

Assets	Owner-farmer		Tenant farmer		Total	
	Mean	N	Mean	N	Mean	N
Residential house value (Rs.)	6,03,789	99	6,02,857	97	6,03,743	99
Number of rooms (no)	3	99	3	97	3	99
Cultivated land value (Rs.)	58,62,286	100	35,80,769	18	58,40,446	96
Cattle shed/ Farmhouse value (Rs.)	51,863	17	38,750	6	51,641	17
Farm Pond value (Rs.)	76,315	5	50,000	1	75,959	5
Storage house value (Rs.)	2,29,765	1		0	2,29,765	1
Total assets(value)	65,02,330	100	12,78,542	100	62,37,462	100

### Asset value by irrigation status

The value of farm assets in irrigated and dryland farming can vary significantly. Irrigated farming, which involves the application of water to crops, often results in higher yields and a more consistent crop production, leading to potentially higher values for farm assets such as land, buildings, equipment, and infrastructure. On the other hand, dryland farming, which relies solely on rainwater, can result in lower yields and more unpredictable crop production, potentially leading to lower values for farm assets.

Factors that can influence the value of farm assets in both irrigated and dryland farming include the quality of the soil, the availability of water and other resources, the state of the local and global economy, and the cost of inputs such as seeds, fertilizers, and labor. Additionally, government policies and programs that support agriculture, as well as technological advancements and innovations, can also have a significant impact on the value of farm assets.

The table 4.16 analyses the assets value in both irrigated and dryland farmers. The results shows that total asset value of irrigated farmers was Rs.72,90,553 while that of dryland farmers is Rs.45,41,676 in year 2020. In all asset classes that in residential value, land value, cattle shed and farm ponds the asset value for irrigated farmers was higher than the dryland farmers.

It's important to note that the value of farm assets can fluctuate over time and may be subject to various risks, including natural disasters, disease outbreaks, market changes, and fluctuations in commodity prices. To mitigate these risks, farmers may choose to diversify their operations, invest in risk management strategies like digging bore well to expand irrigated area or invest in drip or sprinkler irrigation systems to increase irrigation efficiency.

**Table 4.16: Assets value by irrigation status**

Assets	Dry land		Irrigated land		Total	
	Mean	N	Mean	N	Mean	N
Residential house value (Rs.)	5,14,578	98	6,58,307	99	6,03,743	99
Number of rooms (no)	3	98	3	99	3	99
Cultivated land value (Rs.)	44,28,495	89	66,24,863	100	58,40,446	96
Cattle shed/ Farmhouse value (Rs.)	43,639	13	55,133	19	51,641	17
Farm pond value (Rs.)	40,286	3	84,283	7	75,959	5
Storage house value (Rs.)	25,200	1	3,15,000	1	2,29,765	1
Total assets value (Rs)	45,41,676	100	72,90,553	100	62,37,462	100

### Asset value by state

The value of agricultural assets in a region can vary widely depending on several factors such as the type of crops grown, the productivity of the land, the availability of water, and the infrastructure available in the region. Some regions in India, such as the states of Punjab and Haryana, are known for their high productivity in agriculture, while others, such as certain parts of eastern India, are characterized by low agricultural productivity due to a lack of infrastructure and resources. As a result, asset values in the former state are more than the later regions.

In the value of total assets, Karnataka farmers are having highest (Rs.79,46,403) followed by Telangana state (Rs.57,36,582) and the least in Andhra Pradesh (Rs.50,08,531) (Table 4.17). Of the total assets agricultural and residential house are contributing major share in all the states. Although in Telangana farmers have smaller landholding because of the higher land prices, their asset value is more than Andhra Pradesh. The higher land value in Telangana is attributed to Rythu Bandhu scheme.

Rythu Bandhu is an agriculture investment support scheme introduced by the government of Telangana, aimed at providing financial assistance to farmers for their agriculture activities. The scheme provides farmers with

financial assistance of Rs. 5,000 per acre per season for two crop seasons, i.e., Kharif and Rabi. The scheme is designed to provide financial support to all farmers irrespective of the land size, who often face difficulty in obtaining credit from banks, to invest in their farm activities. If a farmer is owning 40 acre, he will get Rs. 4 lakh per year Rs.5000/season/acre without any upper limit of financial assistance. This is contributing increased land prices, as irrespective of profitability of agriculture, land-owners are at least getting guaranteed financial assistance. Although PM-KISAN and YSR Barosa schemes are implemented in Karnataka and Andhra Pradesh respectively, there is a limit on the financial assistance like Rs.6,000/year/farmers in former and Rs.13,500/farmer in case of later irrespective of farm size. And large landholders are ineligible, hence there is no demand for agricultural land from non-farmers, who merely seeing some real estate benefits and satisfied with Rs.10,000/acre.

The Rythu Bandhu scheme is considered as a major initiative by the Telangana government to improve the livelihoods of farmers and provide them with the necessary resources to sustain their agriculture activities. Overall, the Rythu Bandhu scheme is seen as a step towards improving the financial stability of farmers in Telangana and enabling them to invest in their farm activities and improve their yields. The scheme has been well received by the farming community in Telangana and is being considered for implementation in other states as well.

**Table 4.17 Assets value by state**

State Name	Telangana		Karnataka		Andhra Pradesh		Total	
	Mean	N	Mean	N	Mean	N	Mean	N
Residential house value	7,13,043	100	5,52,406	100	5,48,491	97	6,03,743	97
Cultivated land value	50,63,998	99	77,84,912	95	46,55,089	94	58,40,446	96
Cattle shed/ Farmhouse value	54,828	22	53,379	15	44,769	14	51,641	17
Farm pond value	70,810	9	82,719	7			75,959	5
Storage house value	2,29,000	3	6,00,000	0	50,000	0	2,29,765	1
Total asset value	57,36,582	100	79,46,403	100	50,08,531	100	62,37,462	100



## Chapter-5

### Savings behaviour of households

Savings of farmers can play an important role in the financial stability and well-being of the farming community. Farmers often face numerous financial challenges, such as fluctuations in crop prices, unpredictable weather patterns, and the high cost of inputs, which can make it difficult for them to save money. Despite these challenges, farmers can still build their savings through a combination of good financial practices and government support programs.

Some ways in which farmers can increase their savings include:

**Diversifying their income sources:** Farmers can diversify their income sources by growing multiple crops, engaging in non-farm activities, and participating in government schemes.

**Controlling expenses:** Farmers can control their expenses by reducing the cost of inputs, using efficient farming practices, and avoiding waste.

**Availing of government support schemes:** Farmers can avail of government support schemes, such as loan waiver programs and investment support schemes, which can help them build their savings.

**Investing in assets:** Farmers can invest in assets such as land, livestock, and equipment, which can provide them with a steady source of income and increase their net worth over time.

**Planning for retirement:** Farmers can plan for their retirement by setting aside a portion of their income each year and investing in long-term savings instruments.

Overall, increasing the savings of farmers is critical for their financial stability and well-being, and can help them to weather financial challenges and invest in their future.

#### Savings by religion category

Savings of households by religion are presented in table 5.1 which shows that, 23 per cent of Hindu farmers saved with an average amount of Rs.29,857 in Self Help Group, while Muslim respondents saved an average amount of Rs.32,550 (15% of Muslims) and Christian respondents saved Rs.22,236 (43% of Christians). Savings are slightly higher among Christians (Rs.9,668) and Hindus (Rs.9,323), while lower in Muslims (Rs.7,642). It is to be noted that these savings are included savings in commercial banks. Overall, savings rates are very low compared to their needs and operational expenses in agriculture, which is an alarming situation.

**Table 5.1. Savings by religion category**

Religion	Hindu		Muslim		Christian		Total	
	Mean	N	Mean	N	Mean	N	Mean	N
Self Help Group Amount saved (cumulative)	29,857	23	32,550	15	22,236	43	29,690	23
Co-operatives Amount saved	87,313	2	68,500	4		0	86,206	2
Farmer Producer Organization	24,733	1		0		0	24,733	1
Others	2,500	0	0	2		0	1,250	0
Total savings	9,323	100	7,642	100	9,668	100	9,267	100

## Savings by social group

Scheduled Castes (SCs), Scheduled Tribes (STs), and Other Backward Classes (OBCs) are socially and economically disadvantaged groups in India. The government has implemented various schemes and programs aimed at improving the financial status and standard of living of farmers belonging to these groups.

Here are some of the schemes for SC, ST, and OBC farmers, which can improve savings capabilities of the farmers in India:

1. Pradhan Mantri Fasal Bima Yojana (PMFBY): This is a crop insurance scheme for farmers in India, including those from SC, ST, and OBC communities. The scheme provides insurance coverage for crops against natural calamities, pests, and diseases.
2. Pradhan Mantri Kisan Samman Nidhi (PM-KISAN): This is a central sector scheme aimed at providing financial support to farmers in India, including those from SC, ST, and OBC communities. Under this scheme, farmers receive an amount of INR 6,000 per year in three equal instalments.
3. National Scheduled Castes Finance and Development Corporation (NSFDC): This is a government organization that provides financial assistance to SC families for income-generating activities, including agriculture.
4. National Backward Classes Finance and Development Corporation (NBCFDC): This is a government organization that provides financial assistance to economically backward classes, including OBCs, for income-generating activities, including agriculture.
5. National Scheduled Tribes Finance and Development Corporation (NSTFDC): This is a government organization that provides financial assistance to ST families for income-generating activities, including agriculture.

Overall, these schemes aim to provide financial support and resources to farmers from SC, ST, and OBC communities, which can help them improve their standard of living and increase their savings.

Table 5.2 reported the amount of savings by social group among the sample farmers. Overall, 23 per cent of sample farmers saved in SHGs, more number of SC households (32%) saved in SHGs. Overall, the amount saved through SHGs per household was Rs.29,690, it was highest among OBC (Rs.38,618) and lowest among FC households (Rs.20,186). FPOs, cooperatives, play a minor role in promoting savings. Overall, only 2 per cent of the sample farmers saved in cooperatives and only one percent saved through FPOs. Through cooperatives about 4 percent of OBC and 2 percent of FC households are saved their money, but SC and ST sample households didn't save any money through cooperatives. These figures indicates that SHGs as saving vehicles are more inclusive than the cooperatives. While FPOs are yet to pick up, but there is a huge potential as government of India and state governments are also encouraging FPOs in agricultural value chain development from local to global level.

**Table 5.2 Patterns of savings by households by social group**

Caste	SC		ST		OBC		FC		Total	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Self Help Group	34,098	25	29,490	32	38,618	22	20,186	22	29690	23
Co-operatives		0		0	1,00,143	4	63,692	2	86206	2
Farmer Producer Organizations	60,000	1		0	23,846	2	1,000	0	24733	1
Others		0		0	0	0	2,500	0	1250	0
Total savings	9,047	100	9,291	100	12,608	100	6,077	100	9267	100

There are several reasons why savings among SC, ST, and OBC farmers in India tend to be low:

**Low-income levels:** Farmers belonging to SC, ST, and OBC communities often have low income levels, which limits their ability to save money. Their low income is largely due to factors such as limited access to resources, lack of education, and discrimination.

**High levels of debt:** Many farmers in these communities are burdened by high levels of debt, which reduces their ability to save money. This debt can be due to factors such as poor crop yields, lack of access to credit, and high interest rates.

**Limited access to formal banking systems:** Many farmers in SC, ST, and OBC communities do not have access to formal banking systems and are unable to open a savings account or take advantage of other financial services. This further limits their ability to save and invest their money.

**Agricultural risks:** Agriculture is a risky business, and farmers in SC, ST, and OBC communities are often more vulnerable to agricultural risks such as droughts, floods, and pest infestations. These risks can have a major impact on their income and savings.

**Lack of financial literacy:** Many farmers in these communities have limited financial literacy and are unaware of the various savings and investment options available to them. This limits their ability to make informed financial decisions and grow their savings.

Overall, the low savings levels among SC, ST, and OBC farmers in India are a result of a complex interplay of social, economic, and systemic factors. Addressing these factors is crucial to improving the financial status and standard of living of farmers in these communities.

### **Savings by owned land category**

Table 5.3 presents saving pattern of households by land-ownership category. More number of small and medium farmers are having savings with SHGs when compared to both marginal and large farmers. Especially share of large farmers who saved with SHGs drastically low compared to other land-size groups. However, large farmers save more amount Rs.58,800 per household compared to other households (about Rs.29,000) in SHGs. Another important aspect is, households who have savings with cooperatives are higher among marginal and large farmers compared to small and medium farmers. This pattern is exactly opposite as that of saving with SHGs. In general savings with cooperatives are much higher per household compared to SHGs. Average amount of savings with cooperatives are higher among semi-medium farmers (Rs.1,22,727), followed by large farmers (Rs.81,667), medium farmers (Rs.71,556), small (Rs.63,667) and the least in marginal farmers (Rs.62,000). However, it may be the possibility

that many medium and large farmers are also savings with commercial banks and in larger quantity, which were not covered in this study.

Small farmers in India often face challenges in saving money due to their limited income levels, high levels of debt, limited access to formal banking systems, and other factors (Deolalikar and Rose, 1998; Neti et al., 1998; Benami and Carter, 2021). Despite these challenges, small farmers can still take steps to improve their savings and financial stability. Here are some ways that small farmers can increase their savings:

1. Diversify their income sources: Small farmers can look for ways to diversify their income sources, such as by engaging in non-farm activities or taking up off-farm employment.
2. Use informal savings networks: Small farmers can participate in informal savings networks, such as rotating savings and credit associations (ROSCAs), participate in SHG groups and taking membership in FPOs which can help them save and access credit when needed.
3. Avail government schemes: Small farmers can take advantage of government schemes and programs, such as the Pradhan Mantri Fasal Bima Yojana (PMFBY) and Pradhan Mantri Kisan Samman Nidhi (PM-KISAN), which provide insurance coverage and financial support for the farmers.
4. Participate in financial literacy programs: Small farmers can participate in financial literacy programs, which can help them understand financial management and investment options.
5. Develop a household budget: Small farmers can develop a household budget to keep track of their expenses and identify areas where they can reduce costs and increase savings.

Overall, increasing savings is important for small farmers in India to improve their financial stability and secure their future and to become resilient to climate vulnerability and implement adaptation strategies. By taking advantage of government schemes, participating in financial literacy programs, and developing a household budget, small farmers can increase their savings and achieve their financial goals.

**Table 5.3. Household savings by own-land size category.**

Institution	Marginal		Small		Semi-Medium		Medium		Large		Total	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Self Help Group	29,143	21	29,561	30	28,799	26	29,274	21	58,800	6	29,143	21
Co-operatives	62,000	3	63,667	2	1,22,727	2	71,556	2	81,667	3	62,000	3
Farmer Producer Organizations		0	60,000	0	30,100	2	2,500	1		0		0
Others		0		0	0	0	2,500	0		0		0
Total savings	7,709	100	10,544	100	11,175	100	7,748	100	6,612	100	7,709	100

## Savings by cultivated land size category

The table 5.4 presented savings of farmers based on total cultivated land. Savings with SHGs are highest among marginal farmers than large farmers. About 25 per cent of marginal farmers on average saved Rs.41,656, while only 14 percent of the large farmers on average saved Rs.38,834. While only 8 per cent of marginal farmers are also saving with cooperatives and only 3 percent of large farmers saved with cooperatives. So, SHGs and cooperatives are creating more enabling environment for savings among marginal cultivators (who are either cultivating owned land or on tenant basis) than the large farmers. As previously mentioned, large farmers may be depending more on commercial banks for their savings as well as borrowings as they can get larger sums as credit from them than that of the SHGs and cooperatives.

Self-help groups (SHGs) and cooperatives can play an important role in helping small farmers increase their savings. Here are some ways that SHGs and cooperatives can support farmers in saving:

**Pooled savings:** SHGs and cooperatives allow farmers to pool their savings together, which can help increase their overall savings and provide them with access to larger amounts of credit.

**Increased access to formal banking systems:** SHGs and cooperatives can help farmers gain access to formal banking systems, such as savings accounts and loans, which can help them increase their savings and improve their financial stability.

**Improved financial literacy:** SHGs and cooperatives can provide training and education on financial management, which can help farmers make informed financial decisions and improve their savings.

**Shared risk management:** By pooling their savings and resources, farmers in SHGs and cooperatives can better manage risks and cope with shocks, such as droughts or pest infestations, which can have a major impact on their income and savings.

**Increased bargaining power:** Farmers in SHGs and cooperatives can leverage their collective bargaining power to negotiate better prices for their crops, which can help increase their income and savings.

Overall, SHGs and cooperatives can provide valuable support to small and marginal farmers in increasing their savings and improving their financial stability. By pooling their savings, improving their financial literacy, and leveraging their collective bargaining power, farmers in SHGs and cooperatives can achieve their financial goals and secure their future.

**Table 5.4. Household savings by land cultivated size category**

	Marginal		Small		Semi-Medium		Medium		Large		Total	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Self Help Group	41,656	25	30,880	25	26,158	27	27,888	23	38,834	14	29,690	23
Co-operatives	76,667	8	43,500	1	1,32,000	2	71,400	2	68,857	3	86,206	2
Farmer Producer Organizations		0	60,000	1	30,100	2	2,500	1		0	24,733	1
Other		0		0	0	0		0	2,500	0	1,250	0
Total savings	16,164	100	8,514	100	10,793	100	7,769	100	8,110	100	9,267	100

### Savings of households by poverty status

In general, poor farmers tend to have lower levels of savings compared to non-poor farmers. This is due to various factors such as limited access to credit and financial services, unpredictable income streams, and higher dependence on subsistence agriculture. Non-poor farmers, on the other hand, typically have more diversified income sources, better access to financial services, and greater ability to save and invest in their farms. However, it's important to note that there can be significant variations within each group depending on specific contexts and individual circumstances.

Table 5.5 represents savings of poor and non-poor farmers in year 2020 and 2021. Nearly 22 per cent in 2020 and 20 percent in 2021 saved with SHGs among the non-poor. 26% of poor both in 2020 and 2021 are saved with SHGs. Similarly, only 2-4 percent of both poor and non-poor saved in both normal and abnormally loss years. With FPOs only 1 per cent of the poor and non-poor saved in both normal and abnormal years. The results indicates that farmers savings with SHGs, cooperatives and FPOs are continued even during the distress years. They take them as social obligation to save with SHGs and cooperatives. Now the FPOs are also coming as one of the saving institutions for farmers even for the poor.

**Table 5.5. Household savings of households by poverty status in 2020 and 2021**

Savings	2020-21						2021-22					
	Non-Poor		Poor		Total		Non-Poor		Poor		Total	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Self Help Group	37,179	22	17,369	26	29,690	23	39,203	20	21,474	26	29,690	23
Co-operatives	94,188	2	79,111	4	86,206	2	61,583	2	99,636	3	86,206	2
Farmer Producer Organizations	29,900	1	14,400	1	24,733	1	36,625	1	11,143	1	24,733	1
Others	2,500	0	0	0	1,250	0	1,250	0		0	1,250	0
Total savings	10,030	100	7,733	100	9,267	100	9,270	100	9,262	100	9,267	100

Note: N= percent

### Household saving by land tenancy status.

Savings among tenant farmers can vary widely depending on a range of factors such as the size of their landholding, the crops they cultivate, and the terms of their lease agreements. In general, tenant farmers may face greater challenges in saving money compared to landowners, as they may have to pay a significant portion of their income as rent and may not have the same level of control over their agricultural activities. Additionally, tenant farmers may have limited access to credit and financial services, which can make it difficult for them to build up savings. However, some tenant farmers may be able to save by adopting efficient farming practices, diversifying their income sources, and joining as members of cooperatives, SHGs and FPOs to share resources and reduce costs.

23 and 17 per cent of owner-farmers and tenant farmers are saved amount in SHGs, whereas 3 per cent own-farmers and zero per cent of tenant farmers saved with cooperatives. However, amount saved dint not vary significantly with the tenancy status. Tenant farmers are facing some obstacles even in saving with SHGs, cooperatives and FPOs. This is mainly due to lack of ownership rights on the land (Table 5.6).

**Table 5.6. Savings of households by land tenancy status**

Institution	Owner-farmer		Tenant-farmer		Total	
	Mean	N	Mean	N	Mean	N
Self Help Group	29,715	23	29,042	17	29,690	23
Co-operatives	86,206	3		0	86,206	2
Farmer Producer Organizations	24,733	1		0	24,733	1
Others	1,250	0		0	1,250	0
Total savings	9,503	100	4,840	100	9,267	100

Dryland farmers and irrigated farmers differ in their ability to save money due to differences in their crop yields and incomes. Irrigated farmers typically have access to a reliable water supply, which allows them to grow higher-yielding crops and generate more consistent income. This can provide them with greater opportunities to save money compared to dryland farmers, who may have to contend with unreliable rainfall and lower crop yields. Dryland farmers may also face higher input costs for water and other resources, which can further limit their ability to save. However, it's important to note that there can be significant variations within each group depending on specific contexts and individual circumstances. For example, some dryland farmers may be able to implement water-conserving techniques or cultivate drought-tolerant crops that can help them improve their yields and save money.

The table 5.7 indicates that both number of savers and also amount saved per household was higher among irrigated farmers than the dryland farmers. About 21 percent saved with SHGs and 1 percent saved with cooperatives among dryland farmers, while among irrigated farmers, 23 percent saved with SHGs, 2 per cent saved with cooperatives and 1 percent saved with FPOs. On average irrigated farmers saved Rs.38,019 while dryland farmers saved Rs.13,626 with the SHGs. The average savings with cooperatives is Rs.47,200 and Rs.86,206 by dryland and irrigated farmers. On average savings of irrigated farmers was 3 times higher than dryland farmers.

Dryland farmers may face several challenges in saving money due to their lower crop yields and income volatility. Because they depend on rainfall rather than irrigation, their crop yields can be more unpredictable and lower, which can lead to lower profits and difficulty in meeting basic needs. As a result, dryland farmers may have less income available to save, particularly during times of drought or other weather-related disasters.

In addition, dryland farmers may have limited access to credit and financial services, which can make it difficult for them to invest in their farms or save for the future. This is especially true in areas where financial institutions are scarce or where dryland farming is less profitable, as lenders may be hesitant to extend credit to farmers with a higher risk of default.

Finally, dryland farmers may also face higher input costs for water and other resources, such as fertilizers and pesticides, which can further limit their ability to save. All these factors can make it challenging for dryland farmers to build up savings and invest in their farms, particularly in the face of environmental and economic uncertainties.

**Table 5.7. Household savings by irrigated and dryland farmers.**

Institutions	Dry land		Irrigated land		Total	
	Mean	N	Mean	N	Mean	N
Self Help Group	13,626	21	38,019	25	29,690	23
Co-operatives	47,200	1	92,931	3	86,206	2
Farmer Producer Organizations		0	24,733	2	24,733	1
Others		0	1,250	0	1,250	0
Total savings	3,239	100	13,010	100	9,267	100

The region in which farmers operate can influence their savings behaviour. For example, farmers in regions with a high cost of living or limited access to credit may be more likely to save in order to build a financial cushion for unexpected expenses or to invest in their farms. Similarly, regions with a high prevalence of natural disasters or other risks may encourage farmers to save in order to mitigate potential losses. Additionally, social and cultural norms in a region can influence savings behaviour, such as the importance of saving for future generations or the role of community support systems. Sometimes higher cost of living and cost of cultivation hinder the savings as all income from different sources are spent on living expenses and agricultural expenses. Therefore, region-specific factors can play an important role in determining the savings behaviour of farmers.

Table 5.8 shows the savings by farmers in three states, namely Telangana, Karnataka, and Andhra Pradesh. Savings rates are much higher in Telangana and lowest in Karnataka. About 48% of farmers are saved with SHG groups, while this number is 23 per cent in Andhra Pradesh and only one percent in Karnataka. Similarly, average savings per household who saved are also higher in Telangana (Rs.45,320) and lowest in Andhra Pradesh (only Rs.283). This wide difference may be due to governments emphasis on SHG movement in Telangana followed by Andhra Pradesh. SHG movement is not widespread in Karnataka. Similarly, savings with cooperatives and FPOs are 100 percent from Telangana, while in Karnataka and Andhra Pradesh there is no savings through cooperatives and FPOs. May be Andhra Pradesh and Karnataka farmers are saving through commercial banks, which was not covered in the study.

**Table 5.8. Household savings by State**

State Name	Telangana		Karnataka		Andhra Pradesh		Total	
	Mean	N	Mean	N	Mean	N	Mean	N
Self Help Group	45,320	46	17,833	1	283	23	29,690	23
Co-operatives	86,206	7		0		0	86,206	2
Farmer Producer Organizations	26,429	3	1,000	0		0	24,733	1
Others		0	0	0	2,500	0	1,250	0
Total savings	28,162	100	343	100	83	100	9,267	100



## Chapter-6

### Operational land holdings: Owned, leased-in and leased-out land

Owned land refers to land that is owned outright by an individual. Ownership of land means having legal title to the property, which grants the owner certain rights and privileges, including the right to use, sell, lease, or mortgage the land. The owner is also responsible for paying taxes on the land and maintaining the property. In the context of agriculture, owned land would refer to the land that is owned by farmers for the purpose of cultivating crops, raising livestock, or conducting other agricultural activities. The ownership of land is an important factor in determining the economic and social status of individuals or groups in many societies around the world. "Leased in" and "leased out" refer to the renting or leasing of land for cultivation in India. "Leased in" means that a farmer has rented or leased land from another landowner for cultivation, while "leased out" means that a landowner has rented or leased their land to a farmer for cultivation. This is a common practice in India, where many small-scale farmers do not own enough land to support their families and must lease land from others. In India, the share of leased-in and leased-out land in cultivated land varies by state and region. According to the Agriculture Census of India 2015-16, about 11.6% of the total cultivated area in India is under tenancy. However, the proportion of tenancy varies widely across different states, ranging from 0.6% in Himachal Pradesh to 34.3% in Bihar. However, official estimates of leased-in land is generally underestimation of actuals, as they are mostly unwritten without any documentary evidence.

In some states, such as Punjab and Haryana, the proportion of leased-in land is higher than the leased-out land, indicating that larger farmers are leasing in land to expand their operations. In other states, such as West Bengal and Kerala, the proportion of leased-out land is higher, indicating that smaller farmers are leasing out their land to generate additional income.

It is worth noting that the data on leased-in and leased-out land in India is often incomplete or inaccurate due to the prevalence of informal and undocumented tenancy arrangements, particularly in rural areas.

**Table 6.1. Tenancy based on religion (acre)**

Religion	Hindu		Muslim		Christian		Total	
	Mean	N	Mean	N	Mean	N	Mean	N
Total own land 2021	5.0	95	5.0	90	2.4	87	5.0	95
Total own land 2022	5.0	95	5.0	90	2.4	87	5.0	95
Total leased in 2021	7.6	28	12.4	33	4.9	39	7.7	28
Total leased in 2022	7.5	29	13.1	33	4.3	43	7.6	29
Total leased out 2021	9.4	1	30.0	2	1.0	4	10.1	1
Total leased out 2022	6.1	1	16.0	4	1.0	4	7.3	1
Total cultivated area 2021	6.9	100	7.7	100	4.0	100	6.9	100
Total cultivated area 2022	7.0	100	7.8	100	3.9	100	6.9	100

Table 6.1 presents owned land, leased-in, leased out and cultivated land by religion group. 95% of the farmers having owned land, while 28-29 percent leased in land, some one percent leased-

out land. More farmers leased-in land among Christians (39% in 2020 and 43% in 2021), followed by Muslims (33% in both 2020 and 2021) and Hindus (28% in 2020 and 29% in 2021). Again more farmers leased-out land among Christians, followed by Muslims and least in case of Hindus. Overall, on average owned land was 5 acre, because of more land leased in and less land leased out, the cultivated area increased to 6.9 acre in both the years.

**Table 6.2. land tenancy status by social group (acre)**

Caste	SC		ST		OBC		FC		Total	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Total own land 2021	2.9	90	3.9	97	5.0	94	5.7	96	5.0	95
Total own land 2022	2.9	90	3.9	97	4.9	94	5.7	96	5.0	95
Total leased in 2021	5.8	31	4.6	16	7.5	29	8.7	30	7.7	28
Total leased in 2022	5.5	32	4.7	16	7.5	30	8.6	31	7.6	29
Total leased out 2021	2.0	2	12.0	1	11.5	1	11.6	2	10.1	1
Total leased out 2022	2.0	2		0	12.0	1	6.8	1	7.3	1
Total cultivated area 2021	4.4	100	4.6	100	6.8	100	8.1	100	6.9	100
Total cultivated area 2022	4.4	100	4.7	100	6.9	100	8.1	100	6.9	100

Land tenancy by caste refers to a historical practice in which landownership and tenancy were closely linked to one's social caste. This system was prevalent in many parts of rural India, and was based on the idea that certain castes were deemed more suitable for landownership and farming while others were relegated to tenancy or landless labor. This led to significant inequalities in landownership and access to resources, perpetuating social and economic disparities between different castes. While the Indian government has implemented various land reforms to address these inequities, the legacy of caste-based land tenancy still persists, particularly in areas where caste-based hierarchies remain entrenched.

Overall, total owned land was much higher among FC farmers (5.7 acre) followed by OBC (5 acre), ST (3.9 acre) and SC (2.9) (Table 6.2). After adding leased-in and subtracting leased-out, the total cultivates area was also higher among FC farmers (8.1 acre), followed by OBC (6.9 acre), ST (4.7 acre) and SC (4.4 acre). Leased-in land was also higher among FC and OBC farmers compared to ST and SC farmers. It indicates that land lease market is also subject to some social prejudices in villages, with some discrimination against socially disadvantaged caste groups.

**Table 6.3. Tenancy status by land owned category (acre)**

	Marginal		Small		Semi-Medium		Medium		Large		Total	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Total own land 2021	1.1	66	1.8	100	3.3	99	6.4	100	19.6	100	5.0	95
Total own land 2022	0.9	64	1.8	100	3.3	100	6.4	100	19.6	100	5.0	95
Total leased in 2021	6.8	59	6.4	30	8.0	24	8.7	22	13.8	14	7.7	28
Total leased in 2022	6.9	59	6.3	30	7.6	25	8.9	22	13.8	14	7.6	29
Total leased out 2021	5.0	1	1.8	1	24.7	1	5.7	2	17.3	3	10.1	1
Total leased out 2022		0	3.5	1		0	4.4	2	16.7	3	7.3	1
Total cultivated area 2021	4.7	100	3.8	100	5.2	100	8.3	100	21.1	100	6.9	100
Total cultivated area 2022	4.8	100	3.8	100	5.2	100	8.4	100	21.0	100	6.9	100

Table 6.3 presents the tenancy status by land ownership category. Table shows that about 59% of marginal farmers and 30% of small farmers leased in land, with average leased-in land parcel size is 6.3 to 6.9 acre. In India, many small farmers lease-in land from other landowners for cultivation, as they are not having enough land to support their families or to grow enough crops for their needs. Small and marginal farmers typically lease-in land from other small landowners or from larger landowners who may be more likely to rent out smaller plots of land. Leasing-in land can provide small farmers with access to additional resources, such as land, water, and machinery, that they may not have on their own. However, small farmers who lease-in land may face challenges such as negotiating fair lease agreements, accessing credit and other resources, and dealing with uncertain land tenure arrangements. These challenges are compounded by the fact that many small farmers in India are socially and economically marginalized, and may lack the political power and influence to advocate for their interests.

The table also shows that 14% of large landowners and 22% of medium land owners also leased in land. They leased-in much bigger size lands, on average large farmers leased-in 13.8 acre and medium farmers leased-in 8.8 acre. Large landowners in India may lease-in land from smaller landowners, or they may lease-in land from the government or other institutions that own land. Leasing-in land can be a way for large landowners to expand their operations without having to purchase additional land, and it can also provide income for smaller landowners who may not have the resources or expertise to farm the land themselves. However, the leasing of land is a complex issue in India, with many legal and social factors that can impact land tenure and ownership, and it is often subject to political and economic pressures. As a result of leasing-in and out, the average operational holding size increased for all farm size categories, for example average land size of large farmers increased from 19.6 acre to 21 acre, for medium farmers increased from 6.4 acre to 8.4 acre, for semi-medium farms increased from 3.3 acre to 5.2 acre, for small farmers increased from 1.8 acre to 3.8 acre and for marginal farmers increased from 1.1 acre to 4.8 acre and reap economies of scale.

**Table 6.4. Tenancy status by poverty (acre)**

	2020-21						2021-22					
	Non-Poor		Poor		Total		Non-Poor		Poor		Total	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Total own land 2021	5.5	95	3.8	95	5.0	95	5.5	95	4.3	95	5.0	95
Total own land 2022	5.5	95	3.8	96	5.0	95	5.5	95	4.3	95	5.0	95
Total leased in 2021	8.4	29	6.2	28	7.7	28	8.7	28	6.6	29	7.7	28
Total leased in 2022	8.4	29	6.2	29	7.6	29	8.6	28	6.6	30	7.6	29
Total leased out 2021	11.8	1	5.2	1	10.1	1	13.5	1	5.4	1	10.1	1
Total leased out 2022	7.9	1	1.0	0	7.3	1	7.7	1	6.3	0	7.3	1
Total cultivated area 2021	7.7	100	5.4	100	6.9	100	7.7	100	6.0	100	6.9	100
Total cultivated area 2022	7.7	100	5.5	100	6.9	100	7.7	100	6.1	100	6.9	100.0

In India, poor farmers who lease-in land for cultivation face different challenges compared to non-poor farmers who also lease-in land. Poor farmers often have limited financial resources, access to credit, and bargaining power when negotiating lease agreements, which can make them vulnerable to exploitation by larger landowners or middlemen. Poor farmers also often lack access to information and technical expertise, which can make it difficult for them to make informed decisions about which land to lease and how to manage it effectively.

On the other hand, non-poor farmers who lease-in land may have more resources, bargaining power, and access to information and technical expertise. This can allow them to negotiate more favorable lease terms, invest in better farming practices, and improve their productivity and profitability. Non-poor farmers may also be better positioned to cope with risks such as climate variability or market fluctuations, which can pose significant challenges for poor farmers.

The table 6.4 has given details of the land-owned, leased-in, leased-out and total cultivated areas in 2020 and 2021. On average, poor farmers own less land, also leased in less land as a result their cultivated land is less than the non-poor farmers. On average poor farmers own only 3.8 acre, leased-in 6.2 acre resulted in average cultivated area increased to 5.4 acre in 2020-21. While non-poor farmers own 5.5 acre, leased-in 8.4 acre, resulted in total cultivated area increased to 7.7 acre.

Poor farmers with their limited capacity in terms of financial and other resources are not willing to leased-in more land, while non-poor farmers are able to take more leased-in land and reap benefits of scale economies.

**Table 6.5. Tenancy status by pure tenancy(acre)**

PureTenant2022	Owner-tenant		Landless tenant		Total	
	Mean	N	Mean	N	Mean	N
Total own land 2021	5.0	100	6.7	7	5.0	95
Total own land 2022	5.0	100		0	5.0	95
Total leased in 2021	7.7	25	7.6	90	7.7	28
Total leased in 2022	7.7	26	7.5	92	7.6	29
Total leased out 2021	10.4	1	5.0	1	10.1	1
Total leased out 2022	7.3	1		0	7.3	1
Total cultivated area 2021	6.9	100	7.3	100	6.9	100
Total cultivated area 2022	6.9	100	7.5	100	6.9	100

A landless tenant farmer is an agricultural worker who cultivates crops or raises livestock on leased land but does not own any land themselves. These farmers typically rent small plots of land from landowners and work on a subsistence basis, using traditional farming methods and limited resources. However, in recent years some well-off tenant farmers are leasing in large parcel of land and cultivating commercial crops like chillies, cotton and paddy. Table 6.5 reveals that on average landless tenant farmers are leasing-in about 7.6 to 7.7 acre of land and cultivating whole land. It seems a few farmers (7%) reported leased-in land as their own land, but it is a negligible proportion. Among farmers with some land, only 25-26 percent leased in land with an average leased in land of 7.7 acre. However, the average cultivated area became 6.9 acre for both owner-tenant farmers as well as landless tenant farmers.

The relationship between landless tenant farmers and landowners is often complex, and can be influenced by factors such as caste, class, and gender. Many landless tenant farmers face significant challenges, including limited access to credit, insecure tenure, and low productivity. However, the Indian government has implemented various policies and programs aimed at supporting landless farmers, including land reforms, tenancy laws, and agricultural development initiatives. These policies and programs are designed to promote land redistribution, increase productivity, and improve the livelihoods of landless farmers in India.

**Table 6.6. Land tenancy status for dryland and irrigated farmers (acre)**

Irrigated land wise-2022D	Dry land		Irrigated land		Total	
	Mean	N	Mean	N	Mean	N
Total own land 2021	4.5	87	5.2	100	5.0	95
Total own land 2022	4.5	87	5.2	100	5.0	95
Total leased in 2021	6.8	38	8.6	23	7.7	28
Total leased in 2022	6.8	39	8.6	23	7.6	29
Total leased out 2021	5.9	2	15.9	1	10.1	1
Total leased out 2022	6.8	1	7.6	1	7.3	1
Total cultivated area 2021	6.5	100	7.1	100	6.9	100
Total cultivated area 2022	6.6	100	7.1	100	6.9	100

Land tenancy arrangements can differ between dryland and irrigated farmers. In dryland areas, farmers rely on rainfall for crop production and the productivity of the land can be highly variable depending on the amount and timing of rainfall. As a result, tenancy arrangements in drylands may involve shorter lease periods, with tenants only leasing land for a single growing season, to reduce the risk of long-term commitments in an unpredictable climate. Additionally, landowners in dryland areas may be more willing to negotiate flexible payment terms, such as sharecropping, to reduce their own risks.

In irrigated areas, the productivity of the land is generally more consistent, as farmers have access to a reliable water source. This can lead to longer lease periods and more stable tenancy arrangements, as the risks associated with weather variability are reduced. However, irrigated land may also be more valuable and thus more expensive to lease, which can present challenges for farmers who are unable to afford the high rental rates (Deshpande and Tagade, 2021).

Total owned land was more among the irrigated farmers (5.2 acre) than the dryland farmers (4.5 acre) (Table 6.6). The leased-in land was also higher among irrigated farmers (8.6 acre) than dryland farmers (6.8 acre). But a greater number of dryland farmers are leased-in (38-39%) compared to irrigated farmers (only 23% of irrigated farmers leased-in land). Overall, the average cultivated area of irrigated farmers are little higher (7.1 acre) than the dryland farmers (6.5 to 6.6 acre). Lower cultivated land among dryland farmers is a concern as their productivity, profitability is low and uncertain.

### **Tenancy in different states**

The extent of tenancy among farmers in a state/region depends on several factors, such as land availability, land ownership patterns, agricultural productivity, government policies related to land ownership and leasing, and also direct money transfer schemes like PM-KISAN and Rythu Bandhu and the overall economic activities and conditions of the region. Other factors that may affect tenancy among farmers include the cultural and social norms related to land ownership, average owned land and inheritance, the availability of farm machinery and cost of credit and inputs, and the presence of alternative income-generating opportunities. Additionally, the extent of tenancy among farmers may be influenced by demographic factors, such as aging population, population growth, migration and urbanization, which can impact the availability and price of land.

As explained earlier, average owned land was highest in Karnataka (6.8 acre) followed by Andhra Pradesh (4.5 acre) and least in Telangana (3.6 acre) (Table 6.7). More farmers are leased-in land in Andhra Pradesh (43-45%) compared to Karnataka and Telangana (20-22%). However, average leased-in land per farmers who has taken lease is much higher in Karnataka (10 acre), while it is only 7 acres in Andhra Pradesh and 6.5 acre in Telangana. Overall, average cultivated land after adding leased-in land and subtracting leased-out land is larger in Karnataka (8.6 acre) followed by Andhra Pradesh (7.2 acre) and least in Telangana (4.9 acre).

**Table 6.7. Tenancy status of farmers by state (acre)**

State Name	Telangana		Karnataka		Andhra Pradesh		Total	
	Mean	N	Mean	N	Mean	N	Mean	N
Total own land 2021	3.6	98	6.8	94	4.5	92	5.0	95
Total own land 2022	3.6	98	6.8	94	4.5	93	5.0	95
Total leased in 2021	6.5	21	10.3	21	7.0	43	7.7	28
Total leased in 2022	6.5	20	10.4	22	6.8	45	7.6	29
Total leased out 2021	1.7	1	16.5	2	3.6	1	10.1	1
Total leased out 2022	3.8	1	11.0	1	7.0	0	7.3	1
Total cultivated area 2021	4.9	100	8.6	100	7.2	100	6.9	100
Total cultivated area 2022	4.9	100	8.6	100	7.2	100	6.9	100

## Chapter-7

### Sources of income of households

According to the National Statistical Office (NSO), the average monthly income of a farming household in India is estimated to be around INR 6,426 (approximately USD 87) in 2018. However, this figure varies significantly across different states and regions, with some farmers earning substantially more or less than the average.

Moreover, the income level of small and marginal farmers is often significantly lower than that of larger farmers due to limited access to resources, technology, and markets. In recent years, the Indian government has launched several schemes and programs to support farmers' income, including direct benefit transfers, minimum support prices for crops, and crop insurance. However, there is still a need for significant efforts to improve the income levels of farmers, particularly the small and marginal farmers who form a significant proportion of the farming population in India.

Farmers' income depends on various factors, such as the quality and productivity of their land, the type and yield of crops they grow, the price they receive for their produce, the availability and cost of inputs, the level of technology and innovation they use, and the overall market demand for their products. Other factors that may impact farmers' income include weather conditions, pests and diseases, government policies and regulations related to agriculture and trade, and the cost and availability of labor. Additionally, farmers' income may be affected by socio-economic factors, such as education level, access to credit and markets, and the presence of supportive institutions and infrastructure, such as roads and storage facilities.

Specifically, farmers income in India is influenced by the following factors:

**Land holdings:** The size and quality of land available to farmers influence their income, as larger and more productive land holdings can generate higher yields and profits.

**Agricultural productivity:** The use of improved seeds, fertilizers, irrigation, and other modern farming practices can increase productivity and yields, thereby enhancing farmers' income.

**Market demand and price:** The demand for agricultural products, both domestic and international, and the prices received by farmers for their produce, significantly affect their income.

**Government policies and support:** Government policies and support, such as subsidies on inputs, price support, and credit facilities, can help increase farmers' income.

**Weather conditions:** Adverse weather conditions, such as droughts and floods, can significantly affect crop yields and thereby farmers' income.

**Technology and innovation:** The adoption of modern technologies, such as right dose of fertilizers and use of agrochemicals, can increase productivity and income.



Rural infrastructure: The availability of roads, storage facilities, and markets can increase farmers' income by reducing post-harvest losses and improving access to markets.

Socioeconomic factors: Education level, access to credit and markets, and the presence of supportive institutions and infrastructure, such as cooperatives, can affect farmers' income in India.

The average income of the households are Rs.2,22,388, while it was Rs.2,25,048 among Hindus, Rs.2,23,722 among Muslims and only Rs.63,817 among Christians. Majority, 72% have income from field crops, 66% got income from MGNREGA public works programmes, 49% participated in casual labourer in agriculture, 34% participated in rearing livestock, 23% getting earnings from self-employment in non-agriculture, 11% are getting income from casual labourer in construction in 2020-21 (Table 7.1). About 9% getting from remittances, 2 % getting income from working as domestic workers, a negligible percent getting from fruits and vegetables, sericulture etc. overall, from agriculture, 72% are getting an average income of Rs.1,91,456, while among Hindus, 72% getting an average income of Rs.1,93,442, among Muslims 71% are getting Rs.1,83,067 and among Christians only 48% getting on average Rs.44,525. Although participation in MGNREGA works is 66%, the average income is only Rs.10,749. Among Christians there was more participation in MGNREGA works (91%), participation in casual labourer was also more among Christians.

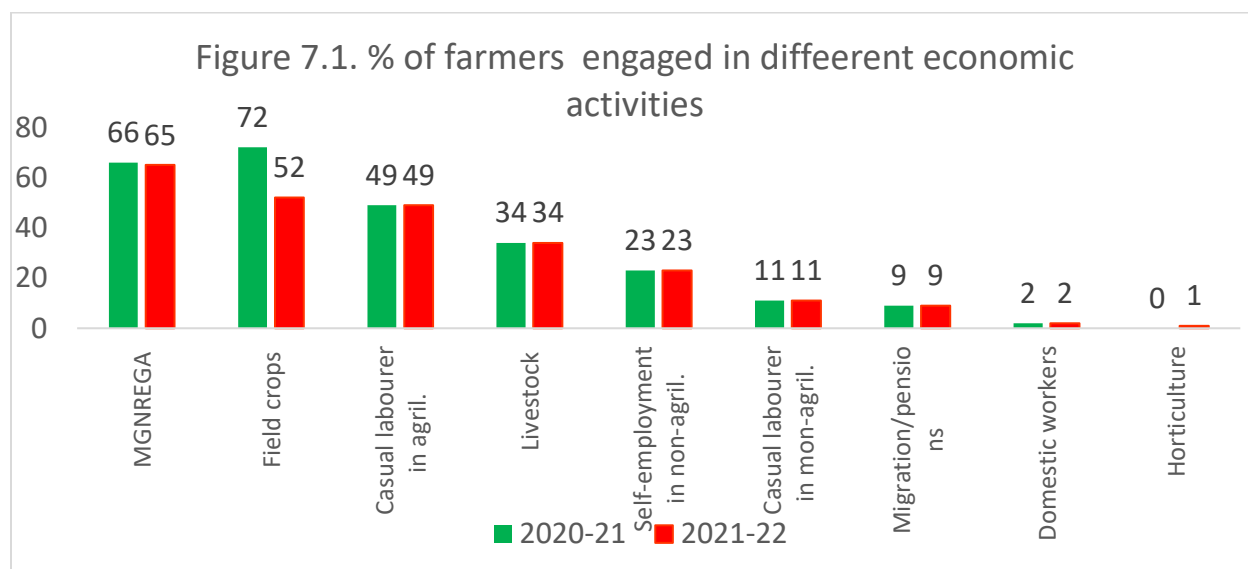
**Table 7.1. Income (Rs/annum) by religion (2020-21)**

Religion	Hindu		Muslim		Christian		Total	
	Mean	N	Mean	N	Mean	N	Mean	N
Field crops	1,93,442	72	1,83,067	71	44,525	48	1,91,456	72
MGNREGA	10,869	65	9,183	69	8,429	91	10,749	66
Casual labourer in agril.	21,432	48	22,200	56	13,786	61	21,310	49
Livestock	25,928	35	24,727	21	33,200	22	25,976	34
Business/self-employment	2,29,977	23	2,15,750	23	55,000	9	2,28,350	23
Casual labourer in construction/non-agril.	31,996	10	21,654	25	12,400	22	30,525	11
Remittances and pensions	27,453	9	22,800	8	30,000	39	27,485	9
Worked as domestic workers	49,962	2	45,333	12		0	49,094	2
Fruits and vegetables	1,80,000	0	3,80,000	2		0	2,13,333	0
Sericulture	50,000	0		0		0	50,000	0
Total household income	2,25,048	100	2,23,722	100	63,817	100	2,22,388	100

**Table 7.2. Household income (Rs./annum) by Religion (2021-22)**

Religion	Hindu		Muslim		Christian		Total	
	Mean	N	Mean	N	Mean	N	Mean	N
MGNREGA	11,323	65	6,683	69	8,048	91	11,069	65
Field crops	1,19,871	52	1,54,877	60	16,593	13	1,20,926	52
Casual labourer in agril.	21,935	48	22,510	56	14,286	61	21,804	49
Livestock	26,296	34	27,545	21	37,750	17	26,420	34
Business/self-employment	2,38,212	23	2,17,417	23	55,000	9	2,36,293	23
Casual labourer in construction/non-agril.	30,270	10	22,108	25	12,400	22	29,025	11
Remittances and pensions	27,453	9	22,800	8	30,000	39	27,485	9
Worked as domestic workers	48,200	2	46,167	12		0	47,806	2
Fruits and vegetables	2,80,857	1	2,40,000	4		0	2,71,778	1
Sericulture	2,00,000	0		0		0	2,00,000	0
Total household income	1,51,879	100	1,87,350	100	43,990	100	1,51,431	100

Farmers obtained less income in 2021-22 compared to 2020-21 in all sectors such as field crops (54.4% reduction), casual labourers in construction/non-agricultural income (-4.9%), from working as domestic workers (-2.6%), fruits and vegetable cultivation (-40%) (Table 7.2 and Figure 7.1). During the year 2021-22, not only crop income is reduced by 54.4%, along with-it income from casual labourer in agriculture and non-agriculture is reduced due to negative multiplier effects of reduced agricultural incomes. Only self-employed in non-agriculture(business) income increased by 3.5% during this abnormally low productive year.



Farmers in India typically face significant financial challenges when such a huge crop failure occurs (in 2021-22 chilly crop was totally devastated with almost 70% to 100% crop loss), as their income is heavily dependent on successful crop yields. Crop failure resulted in farmers facing substantial losses and financial hardship.

To address the issue of farmers' income during crop failure in 2021-22, the state and central governments have implemented various measures, including:

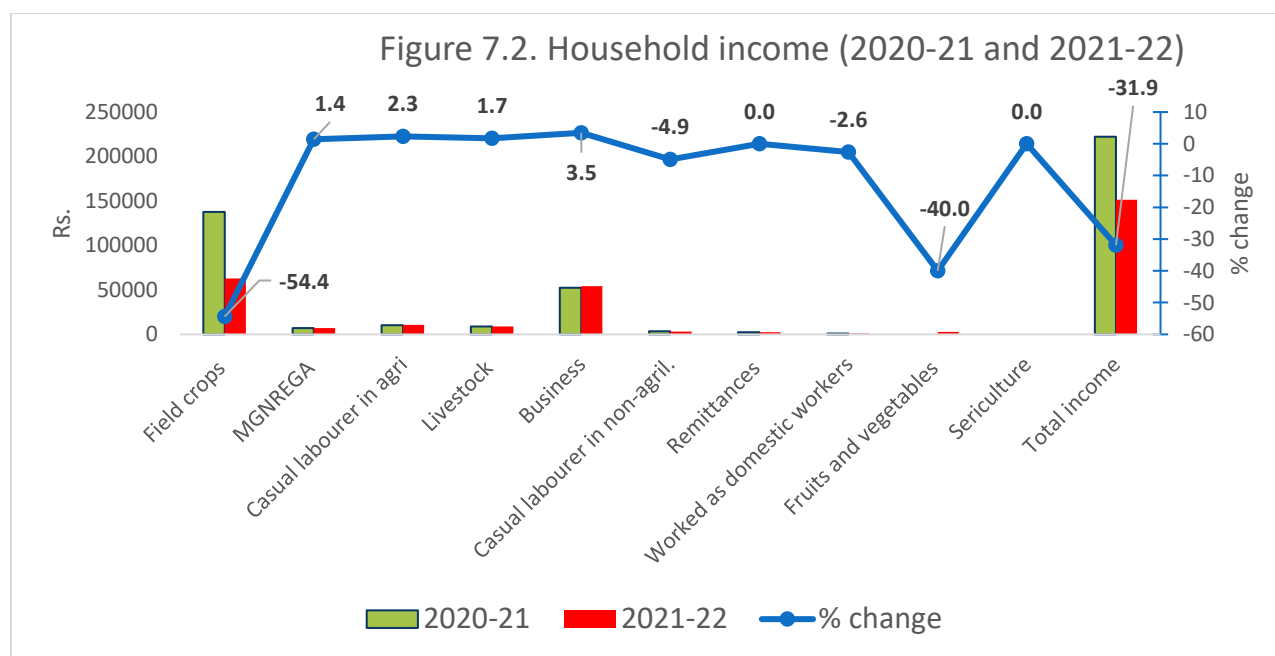
Crop insurance: The government offers crop insurance to farmers to protect them against financial losses due to crop failure (especially in Andhra Pradesh and Karnataka).

Loan waivers: In some cases, the government has waived farmers' loans to provide financial relief in times of crop failure (it is an ongoing scheme).

Price support programs: The government may also provide minimum support prices for certain crops to ensure that farmers receive a fair price for their produce. Although, when the productivity and production is low, generally market prices are higher than MSP announced by government.

Disaster relief: The government provided disaster relief in the form of input subsidies to farmers affected by crop failure due to crop failure due to thrips attack and due to hailstorms.

Overall, while the central and state governments have implemented various measures to support farmers during crop failure, many farmers still struggle to make ends meet in the face of unprecedented crop loss.



**Table 7.3. Household income (Rs/annum) by social group (2020-21)**

Caste	SC		ST		OBC		General		Total	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Field crops	1,23,714	63	1,52,322	80	2,30,701	77	1,74,124	67	1,91,456	72
MGNREGA	10,406	76	15,487	72	10,762	73	9,279	55	10,749	66
Casual labourer in agril.	18,304	69	26,273	60	22,283	53	19,211	37	21,310	49
Livestock	27,696	21	22,211	39	25,462	36	27,391	33	25,976	34
Business/self-employment	1,79,423	20	1,48,933	10	2,35,773	23	2,38,442	25	2,28,350	23
Casual labourer in construction	24,038	20	26,976	14	29,353	10	36,396	9	30,525	11
Remittances from migration	28,200	16	22,200	5	27,030	7	28,219	11	27,485	9
Worked as domestic workers	16,000	2	58,000	1	68,800	3	30,077	2	49,094	2
Fruits and vegetables		0		0	2,80,000	1	1,46,667	1	2,13,333	0
Sericulture		0		0		0	50,000	0	50,000	0
Total hh income	1,49,085	100	1,78,724	100	2,68,640	100	2,05,149	100	2,22,388	100

**Table 7.4. Household income (Rs/annum) by social group (2021-22)**

Caste	SC		ST		OBC		General		Total	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
MGNREGA	10,509	76	13,564	71	10,410	72	11,271	55	11,069	65
Field crops	1,02,900	41	1,00,961	69	1,16,652	52	1,35,774	49	1,20,926	52
Casual labourer in agril.	19,027	70	26,616	61	22,990	52	19,396	37	21,804	49
Livestock	27,833	21	22,429	38	25,925	36	27,913	33	26,420	34
Business/self-employment	1,74,704	21	1,49,267	10	2,42,144	23	2,51,231	25	2,36,293	23
Casual labourer in construction/non-agril.	21,000	20	27,400	14	28,015	10	34,808	9	29,025	11
Remittances from migration (pensions)	28,200	16	22,200	5	27,030	7	28,219	11	27,485	9
Worked as domestic workers	3,000	1	65,000	1	63,867	3	30,077	2	47,806	2
Fruits and vegetables		0		0	3,74,000	1	1,44,000	1	2,71,778	1
Sericulture		0		0		0	2,00,000	0	2,00,000	0
Total hh income	1,14,177	100	1,25,436	100	1,56,756	100	1,61,212	100	1,51,431	100

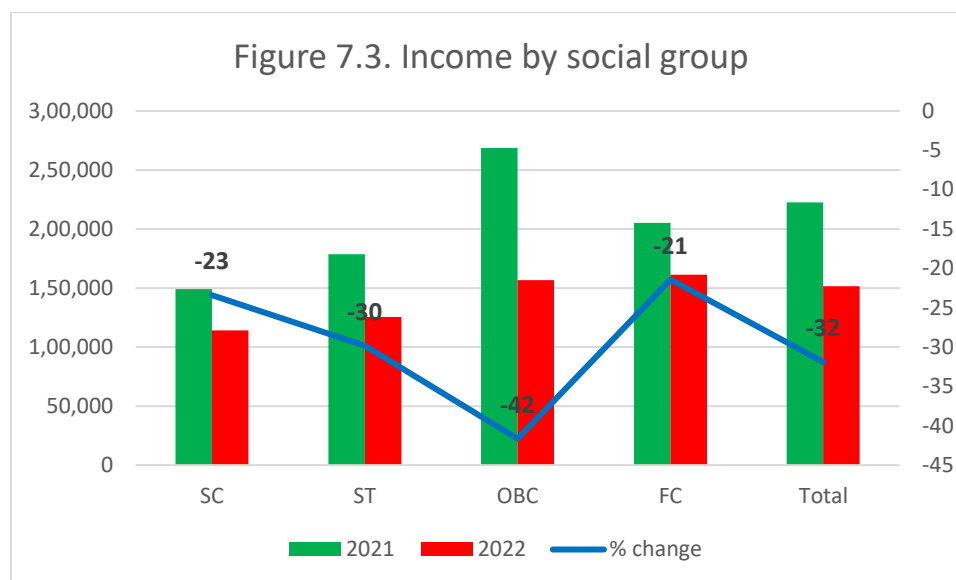


Table 7.3 and 7.4 gave social group wise sources of income in the study area such as SC, ST, OBC and Others. Within OBCs 77 per cent farmers obtained income from field crops in 2020-21 against 52 per cent in 2021-22 (huge exposure to hazard of crop loss). Income from livestock was same in both years but in 2021-22 income from domestic work is lower compared to 2020-21, because of reduction in economic activities in villages and local communities, there is no demand for domestic workers in the villages. However, engagement in casual labour activities and self-employed in non-agriculture was increased in 2021-22 as there was reduction in employment and income opportunities in agricultural sector due to heavy crop loss. About 80 per cent and 69 per cent of ST farmers obtained income from field crops in 2020-21 and 2021-22 respectively. There was no variation of income in livestock sectors among all categories of farmers. Income from casual labour in agriculture is slightly higher in 2021-22 compared to 2020-21, but after discount for inflation, real earnings from casual labourer are lower. Livestock as a source of income reduced in year 2021-22, except for ST farmers wherein in 2021-22 more number of farmers (39% in 2021-22 versus 38% in 2020-21) got engaged in livestock. Casual labour activity was high in SC farmers followed by OBC and ST in both years. Business/self-employment in non-agriculture was more in general category farmers followed by OBC, SC category and ST category. Even during the natural calamity in 2021-22, 69 percent of ST farmers got earnings from field crops, whereas that number is only 41% for SC and 49% for general category farmers.

**Table 7.5. Household income (Rs/annum) by own land class (2020-21)**

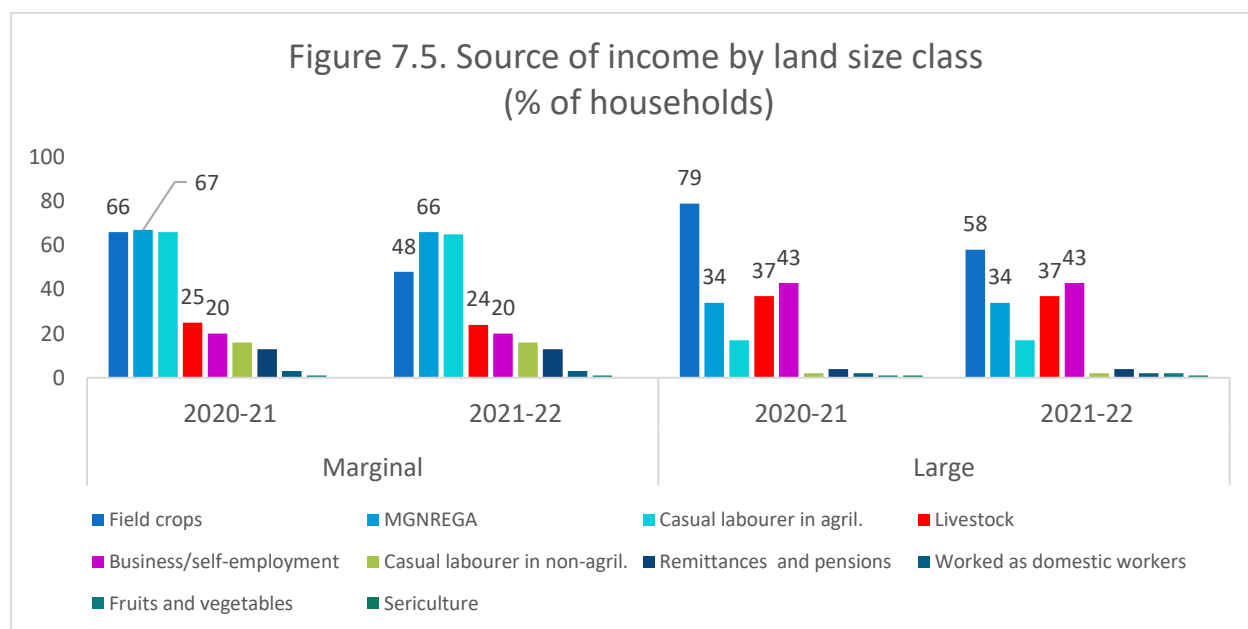
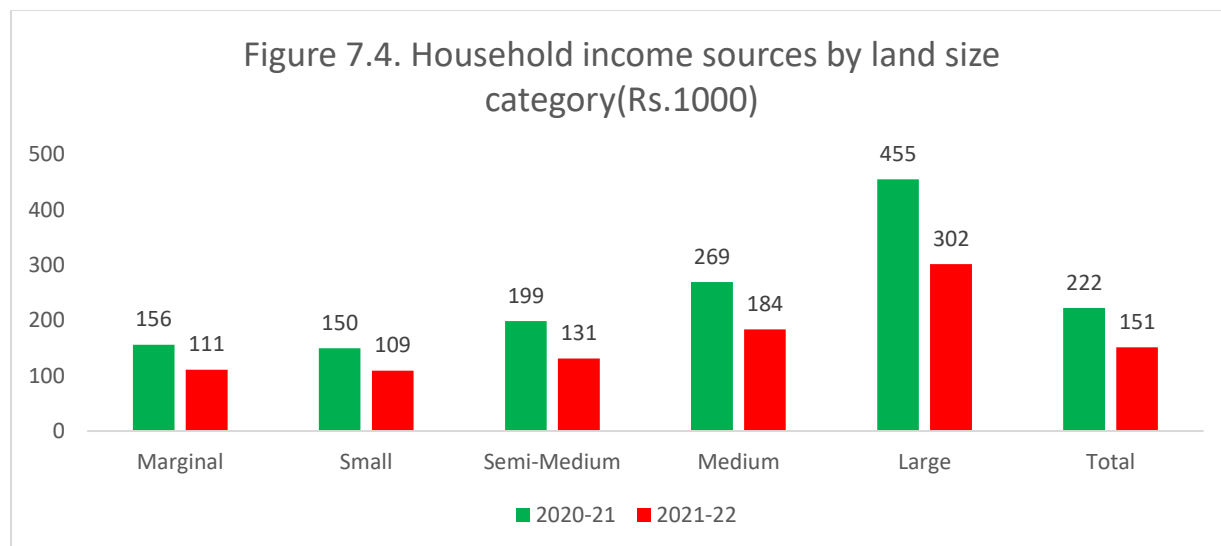
	Marginal		Small		Semi-Medium		Medium		Large		Total	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Field crops	1,34,241	66	1,11,327	66	1,76,880	72	2,22,197	75	3,96,755	79	1,91,456	72
MGNREGA	10,990	67	10,858	73	11,323	71	10,352	63	6,709	34	10,749	66
Casual labourer in agril.	22,477	66	22,255	55	21,076	53	20,034	39	19,941	17	21,310	49
Livestock	23,308	25	23,980	31	24,306	33	26,817	40	36,973	37	25,976	34
Business/self-employment	1,41,675	20	2,32,386	17	2,01,500	18	2,59,945	27	2,77,209	43	2,28,350	23
Casual labourer in non-agril.	34,156	16	32,919	12	23,038	12	35,888	10	26,500	2	30,525	11
Remittances and pensions	28,896	13	28,660	12	27,484	7	26,049	10	24,600	4	27,485	9
Worked as domestic workers	31,400	3	40,500	2	1,02,286	2	35,833	3	12,500	2	49,094	2
Fruits and vegetables	2,80,000	1	70,000	0	3,80,000	0	70,000	0	4,10,000	1	2,13,333	0
Sericulture		0		0		0		0	50,000	1	50,000	0
Total hh income	1,56,219	100	1,49,636	100	1,98,587	100	2,69,288	100	4,54,682	100	2,22,388	100

**Table 7.6. Household income (Rs/annum) by own-land class (2021-22)**

	Marginal		Small		Semi-Medium		Medium		Large		Total	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
MGNREGA	10,923	66	10,396	72	13,243	70	9,384	63	7,541	34	11,069	65
Field crops	89,636	48	70,335	46	1,06,016	53	1,38,485	54	2,67,327	58	1,20,926	52
Casual labourer in agril.	23,135	65	22,823	55	21,616	53	19,879	39	24,118	17	21,804	49
<b>Livestock</b>	<b>24,128</b>	<b>24</b>	<b>23,815</b>	<b>31</b>	<b>24,852</b>	<b>33</b>	<b>27,225</b>	<b>40</b>	<b>37,703</b>	<b>37</b>	<b>26,420</b>	<b>34</b>
Business/self-employment	1,41,800	20	2,36,364	17	2,14,571	18	2,70,809	27	2,78,256	43	2,36,293	23
Casual labourer in non-agril.	30,125	16	30,613	12	22,779	11	35,335	10	23,000	2	29,025	11
Remittances and pensions	28,896	13	28,660	12	27,484	7	26,049	10	24,600	4	27,485	9
Worked as domestic workers	31,400	3	40,833	2	90,714	2	38,182	3	12,500	2	47,806	2
Fruits and vegetables	4,50,000	1	55,000	0	2,80,000	0	3,34,250	1	1,62,000	2	2,71,778	1
Sericulture		0		0		0		0	2,00,000	1	2,00,000	0
Total hh income	1,10,821	100	1,09,101	100	1,30,832	100	1,83,518	100	3,01,902	100	1,51,431	100

From the above table 7.6 and 7.7, it is observed that in both years there was a positive relationship between total owned land size and household income. Income from field crops and livestock shows a significant and positive impact on raising income of the farmers with the increase in land size category. In year-wise comparison, farmers income significantly reduced in 2021-22 compared to 2020-21 due to huge shock to crop income mainly due to thrips attack and hailstorms. In year-wise comparison, about 79 and 66 per cent of households among large and marginal land size categories received income from field crops in 2020-21 compared to only 58 and 48 per cent of households in 2021-22. In the same way, about 37 per cent of large farmers and 25 per cent of marginal farmers obtained income from the livestock sector in 2020-2, where same figures are 37 per cent and 24 percent in year 2021-22. It indicates there was not much

variation in income from livestock in normal and abnormal years. Only 43 per cent of large farmers are engaged in self-employment in non-agriculture and business compared to 17 percent and 20 percent among small and marginal farmers. There is not much change in both normal and calamity year (Figure 7.4 and 7.5). There is an inverse relationship between farm size and income from casual labour in agriculture, casual labourer in construction/non-agriculture and farmers worked as domestic workers, while there was a direct relationship of income from crops, livestock and farm size.



**Table 7.7. Household income (Rs/annum) by cultivated land size (2020-21)**

	Marginal		Small		Semi-Medium		Medium		Large		Total	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Field crops	70,963	73	87,572	70	1,19,395	72	1,97,005	70	4,19,766	76	1,91,456	72
MGNREGA	12,566	78	11,361	74	11,582	71	10,611	64	7,189	48	10,749	66
Casual labourer in agril.	22,385	65	22,339	61	20,879	56	21,670	45	18,903	29	21,310	49
Livestock	20,625	30	23,885	27	20,905	29	26,077	37	33,931	44	25,976	34
Business/self-employment	1,22,313	20	2,21,857	18	1,98,896	16	2,58,959	24	2,30,741	35	2,28,350	23
Casual labourer in non-agril.	22,900	13	40,813	12	22,700	15	36,529	10	29,417	5	30,525	11
Remittances and pensions	31,000	8	28,930	12	28,314	9	26,553	9	25,200	8	27,485	9
Worked as domestic workers		0	53,750	2	84,200	1	44,600	4	14,333	1	49,094	2
Fruits and vegetables		0		0	3,80,000	0	70,000	0	2,07,500	2	2,13,333	0
Sericulture		0		0		0		0	50,000	0	50,000	0
Total hh income	1,11,574	100	1,38,711	100	1,51,054	100	2,34,813	100	4,28,975	100	2,22,388	100

**Table 7.8. Household income (Rs/annum) by cultivated land size (2021-22)**

	Marginal		Small		Semi-Medium		Medium		Large		Total	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
MGNREGA	12,455	76	10,851	73	10,637	70	9,874	64	15,206	48	11,069	65
Field crops	17,896	56	48,251	51	70,674	52	1,25,685	50	2,90,435	54	1,20,926	52
Casual labourer in agril.	21,637	65	22,152	61	21,149	56	22,223	45	22,097	29	21,804	49
Livestock	21,696	29	23,706	26	21,665	28	26,603	37	33,796	44	26,420	34
Business/self-employment	1,22,313	20	2,25,000	18	1,98,194	16	2,77,000	24	2,33,889	35	2,36,293	23
Casual labourer in construction/non-agril.	21,900	13	38,125	12	21,825	15	35,165	10	26,667	5	29,025	11
Remittances and pensions	31,000	8	28,930	12	28,314	9	26,553	9	25,200	8	27,485	9
Worked as domestic workers		0	53,750	2	68,200	1	46,368	4	15,000	1	47,806	2
Fruits and vegetables	2,00,000	1		0	2,80,000	0	2,98,000	1	2,58,000	1	2,71,778	1
Sericulture		0		0		0		0	2,00,000	0	2,00,000	0
Total hh income	71,890	100	1,01,955	100	1,02,097	100	1,65,739	100	2,75,784	100	1,51,431	100

Table 7.8 and 7.9 and figure 7.6 reveals that income of farmers based on land holdings. Farmers obtained high income from field crops in 2020-21 compared to 2021-22. There was a positive relationship between total cultivated land and income from field crops and livestock in both years. Further the result shows that there was no variation in income from livestock, casual labourers in construction/non-agriculture, income from working as domestic workers and business/self-employment/salaried persons. Income from remittances and pensions are also stable in both normal and below normal years (about 8 to 9% of households received remittances or pensions).

In India, the sources of income for farmers depend on the size of their landholdings. Small and marginal farmers, who own less than 2 acres of land, typically rely on a mix of crop cultivation and livestock rearing. They may also engage in wage labor or migrate to urban areas for work during the off-season.



On the other hand, large farmers, who own more than 10 acres of land, typically have diversified sources of income, including crop cultivation, livestock rearing. They may also invest in non-agricultural businesses and self-employment in non-agriculture, such as real estate, education, and healthcare.

Small and marginal farmers income sources are diverse, and they plan that their incomes are resilient to droughts, floods, serious pest outbreaks:

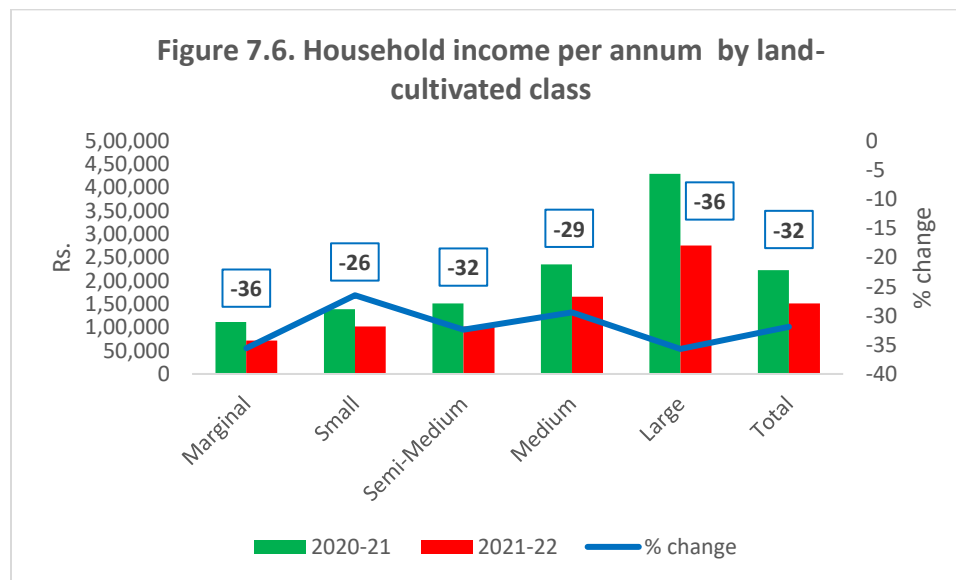
**Crop cultivation:** Small and marginal farmers in India mostly grow food crops such as rice and pulses. But recently they are preferring to grow commercial crops like cotton and chillies. The income from crop cultivation depends on the yield, market prices, and government support in the form of minimum support price (MSP), crop insurance, and subsidies.

**Livestock rearing:** Small and marginal farmers kept livestock such as cows, buffaloes, goats, and sheep for milk, meat, and manure. They have also engaged in poultry farming. The income from livestock rearing depends on the demand and supply of livestock products in the local and regional markets.

**Public works:** Small and marginal farmers and even large farmers are engaged in MGNREGA public works to a greater extent. However, there is an inverse relationship between farm size and participation in public works. During the drought years, participation of households in public works has increased significantly.

**Wage labor:** Small and marginal farmers are working as agricultural laborers in nearby farms during the lean season or in non-farm activities such as construction, transportation, and retail. The income from wage labor depends on the prevailing wages and the availability of work in the local economy.

**Migration:** Small and marginal farmers may migrate to urban areas or other regions for work during the off-season or when the crops fail. The income from migration depends on the nature of work, the wages, and the living conditions in the destination.



**Large farmers:** Large farmers were engaged in not only crops, livestock, but also small business and other non-farm activities. Occasionally they also participated in public works programmes during off-season.

**Crop cultivation:** Large farmers in India were grown a mix of food and cash crops, including high-value horticulture crops such as chillies, cotton, hybrid maize, vegetables, and flowers. They may also adopt modern farming practices such as drip irrigation, greenhouse farming, and contract farming. The income from crop cultivation depends on the yield, quality, and market demand for the crops.

**Livestock rearing:** Large farmers were kept livestock for both commercial and subsistence purposes. Some of them adopted modern animal husbandry practices such as dairy farming and poultry farming. The income from livestock rearing depends on the demand and supply of livestock products in the national and international markets.

**Agro-forestry:** Large farmers were also engage in agro-forestry, which involves growing trees and shrubs along with crops and livestock. However, the income from agro-forestry is limited and depends on the type and quality of the trees and shrubs, as well as the market demand for the products.

**Contract farming:** a very few large farmers entered into contracts with agro-processing companies or exporters to grow crops or raise livestock according to their specifications. The income from contract farming depends on the terms and conditions of the contract, as well as the quality and quantity of the produce.

**Land leasing:** some large farmers leased out their land to other farmers, either for a fixed rent or a share in the produce, however, generally they didn't reveal profits from it. The income from land leasing depends on the size and fertility of the land, as well as the prevailing rent or share in the local market.

**Non-agricultural businesses:** a significant portion of large farmers were also invest in non-agricultural businesses, such as retail shop, real estate, education, electric shop, etc. The income from these businesses depends on the nature of the business, the location, and the market demand.

**Table 7.9. Household income (Rs/annum) sources by poor in 2020-21**

BPL	2021						2022					
	Non-Poor		Poor		Total		Non-Poor		Poor		Total	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
MGNREGA	12,284	64	7,859	69	10,749	66	12,496	64	8,404	68	11,069	65
Field crops	2,30,142	87	26,085	41	1,91,456	72	1,47,043	57	46,542	40	1,20,926	52
Casual labourer in agril.	22,800	49	18,264	48	21,310	49	23,081	48	19,300	50	21,804	49
Livestock	28,204	40	17,875	22	25,976	34	28,624	40	18,275	22	26,420	34
Business/self-employment	2,42,930	31	30,864	5	2,28,350	23	2,51,408	32	30,864	5	2,36,293	23
Casual labourer in non-agril.	40,049	10	17,590	14	30,525	11	37,827	9	17,201	14	29,025	11
Remittances pensions	27,685	11	26,640	5	27,485	9	27,685	11	26,640	5	27,485	9
Worked as domestic workers	70,238	2	8,727	2	49,094	2	69,300	2	8,727	2	47,806	2
Fruits and vegetables	2,13,333	1		0	2,13,333	0	2,71,778	1		0	2,71,778	1
Sericulture	50,000	0		0	50,000	0	2,00,000	0		0	2,00,000	0
Total hh income	3,16,019	100	34,333	100	2,22,388	100	2,05,120	100	43,596	100	1,51,431	100

The table 7.10 and 7.11 presents the sources of income by poverty class in year 2020-21 and 2021-22. In 2020-21 only 33.2 percent of households are poor, while the share of poor in 2021-22 was increased to 46.8% in year 2021-22. It indicates that because of the crop failure in year 2021-22, the poverty ratio was increased by 14% in the study locations. One interesting result is that average income of poor households in year 2020-21 is Rs.34,333, the same household's average income is increased by Rs.10,000 to Rs.43,596 in year 2021-22. It means, the poor in 2020-21 remain almost poor even in year 2021-22. Among the poor in year 2020-21 only 41% engaged in cultivation of field crops and earned on average Rs.26,085, while in next year 2021-22, like 2020-21, 40% of them engaged in agriculture and earned an average Rs. 46,542. It indicates that households who depends on agriculture for incomes are not increasing that fast, getting out of poverty for poor whose main income in agriculture is difficult and require some big push in income from non-agricultural sources.

Table 7.12 presents the average income of households by categorising them as poor and non-poor households based on income levels of 2021-22. Here poor means income-poor based on percapita income for the year 2021-22. The average household income for the poor in year 2021-22 is Rs.33,326. One significant finding is that, farmers who are poor in 2021-22 are actually earned a significant income and most of them are non-poor in previous year 2020-21 (normal years) as their average household income in year 2020-21 are Rs. 1,23,643. Major source of income is field crops which was on average Rs.1,54,541 that too a higher percent (63% of households got agricultural income) in normal year, while the same is reduced to just Rs. 26,151 (that too only 30% of the households earned income from agriculture) in next year's due to huge crop loss.

**Table 7.12. Household income (Rs/annum) source by poor in 2021-22**

BPL	2020-21						2021-22					
	Non-Poor		Poor		Total		Non-Poor		Poor		Total	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
MGNREGA	11,882	64	9,525	68	10,749	66	13,084	64	8,862	66	11,069	65
Field crops	2,17,487	79	1,54,541	63	1,91,456	72	1,56,113	71	26,151	30	1,20,926	52
Casual labourer in agril.	23,374	50	18,831	47	21,310	49	24,019	50	19,147	47	21,804	49
Livestock	30,186	40	19,035	27	25,976	34	30,655	40	19,323	27	26,420	34
Business/self-employment	2,52,993	38	27,686	5	2,28,350	23	2,61,902	38	27,029	5	2,36,293	23
Casual labourer in non-agril.	42,825	10	18,833	12	30,525	11	41,197	10	17,006	12	29,025	11
Remittances and pensions	27,822	12	26,692	6	27,485	9	27,822	12	26,692	6	27,485	9
Worked as domestic workers	79,471	2	14,667	2	49,094	2	78,875	2	14,667	2	47,806	2
Fruits and vegetables	2,38,000	1	90,000	0	2,13,333	0	2,71,778	1		0	2,71,778	1
Sericulture	50,000	0		0	50,000	0	2,00,000	0		0	2,00,000	0
Total hh income	3,09,363	100	1,23,643	100	2,22,388	100	2,55,457	100	33,326	100	1,51,431	100

About 66 percent of poor earned nearly Rs.10,000 from public works, 47 percent earned on average Rs. 19,147 from casual labourer in agriculture, 27 per cent earned on average Rs.19,323 from livestock. Dependence on field crop as major source of income reduced from 72% in normal year to 52% in bad year. Among the non-poor, 87% of the non-poor depend on field crops as major source of income, that share is reduced to 57 percent in bad year. While there is no significant reduction in income sources from other sources like casual labourer in agriculture and non-agriculture, business, remittances, and pensions.

**Table 7.13. Household income(Rs/annum) by land tenancy status (2020-21)**

Source of income	Owner-farmer		Tenant farmer		Total	
	Mean	N	Mean	N	Mean	N
Field crops	1,90,422	72	2,13,802	63	1,91,456	72
MGNREGA	10,822	66	9,205	58	10,749	66
Casual labourer in agril.	21,117	48	23,957	65	21,310	49
Livestock	25,906	34	27,778	25	25,976	34
Business/self-employment	2,28,987	23	2,14,429	19	2,28,350	23
Casual labourer in non-agril.	29,660	11	39,429	19	30,525	11
Remittances from migration (pensions)	27,426	9	28,200	14	27,485	9
Worked as domestic workers	52,828	2	13,000	4	49,094	2
Fruits and vegetables	2,00,000	0	2,80,000	1	2,13,333	0
Sericulture	50,000	0		0	50,000	0
Total hh income	2,22,554	100	2,19,288	100	2,22,388	100

**Table 7.14. Household income (Rs/annum) by land tenancy status (2021-22)**

Pure Tenant wise-2022	Owner-farmer		Tenant-farmer		Total	
	Mean	N	Mean	N	Mean	N
MGNREGA	11,143	66	9,473	57	11,069	65
Field crops	1,19,319	52	1,58,687	42	1,20,926	52
Casual labourer in agril.	21,538	48	25,543	64	21,804	49
Livestock	26,332	34	28,824	24	26,420	34
Business/self-employment	2,37,225	23	2,15,857	19	2,36,293	23
Casual labourer in construction/non-agril.	28,391	11	35,500	19	29,025	11
Remittances from migration (pensions)	27,426	9	28,200	14	27,485	9
Worked as domestic workers	51,536	2	13,000	4	47,806	2
Fruits and vegetables	2,49,500	1	4,50,000	1	2,71,778	1
Sericulture	2,00,000	0		0	2,00,000	0
Total hh income	1,51,282	100	1,54,222	100	1,51,431	100

The above table 7.13 and 7.14 explained the income of the farmers based on tenancy in normal and bad year respectively. Although somewhat a smaller number of tenant farmers reported incomes from agriculture, they reported higher income than owner-farmers from field crops in both years. Bad year in 2021-22 hit both tenant and owner-farmers, both their average earnings reduced significantly in bad year. On average earnings from field crops, public works, livestock, business/self-employment are higher for owner-farmer than the tenant farmer. Whereas income from casual labourer in agriculture and non-agriculture, remittance and pension incomes are more for tenant farmers than owner farmers in both years. More of the tenant farmers can get involved and earn some money from the casual laborer in agriculture, followed by public works and field crops, but in terms of amount of money field crops are playing a greater role followed by casual labourer in agriculture. Ultimately, still casual labourer in agriculture and public works programmes are still providing income for majority of tenant farmer-households.

**Table 7.15. Household income (Rs/annum) by dry and irrigated land (2020-21)**

Source of income	Dry land		Irrigated land		Total	
	Mean	N	Mean	N	Mean	N
Field crops	1,17,714	61	2,27,464	78	1,91,456	72
MGNREGA	8,625	71	12,252	62	10,749	66
Casual labourer in agril.	20,200	56	22,186	44	21,310	49
Livestock	24,904	28	26,465	38	25,976	34
Business/self-employment	2,05,246	22	2,42,586	23	2,28,350	23
Casual labourer in construction/non-agril.	25,177	15	35,873	9	30,525	11
Remittances from migration (pensions)	28,435	15	26,042	6	27,485	9
Worked as domestic workers	43,059	3	55,933	2	49,094	2
Fruits and vegetables	1,75,000	0	2,32,500	0	2,13,333	0
Sericulture		0	50,000	0	50,000	0
Total hh income	1,52,175	100	2,65,991	100	2,22,388	100

**Table 7.16. Household income (Rs/annum)by dry and irrigated land (2021-22)**

Irrigated land wise-2022D	Dry land		Irrigated land		Total	
	Mean	N	Mean	N	Mean	N
MGNREGA	9,011	71	12,540	62	11,069	65
Field crops	98,203	43	1,31,673	57	1,20,926	52
Casual labourer in agril.	21,587	56	21,977	44	21,804	49
Livestock	26,033	28	26,597	38	26,420	34
Business/self-employment	2,08,090	22	2,53,583	23	2,36,293	23
Casual labourer in non-agril.	23,638	15	34,481	9	29,025	11
Remittances from migration (pensions)	28,435	15	26,042	6	27,486	9
Worked as domestic workers	43,353	3	53,214	2	47,807	2
Fruits and vegetables	1,44,000	1	3,74,000	1	2,71,778	1
Sericulture		0	2,00,000	0	2,00,000	0
Total hh income	124960	100	167869	100	151431	100

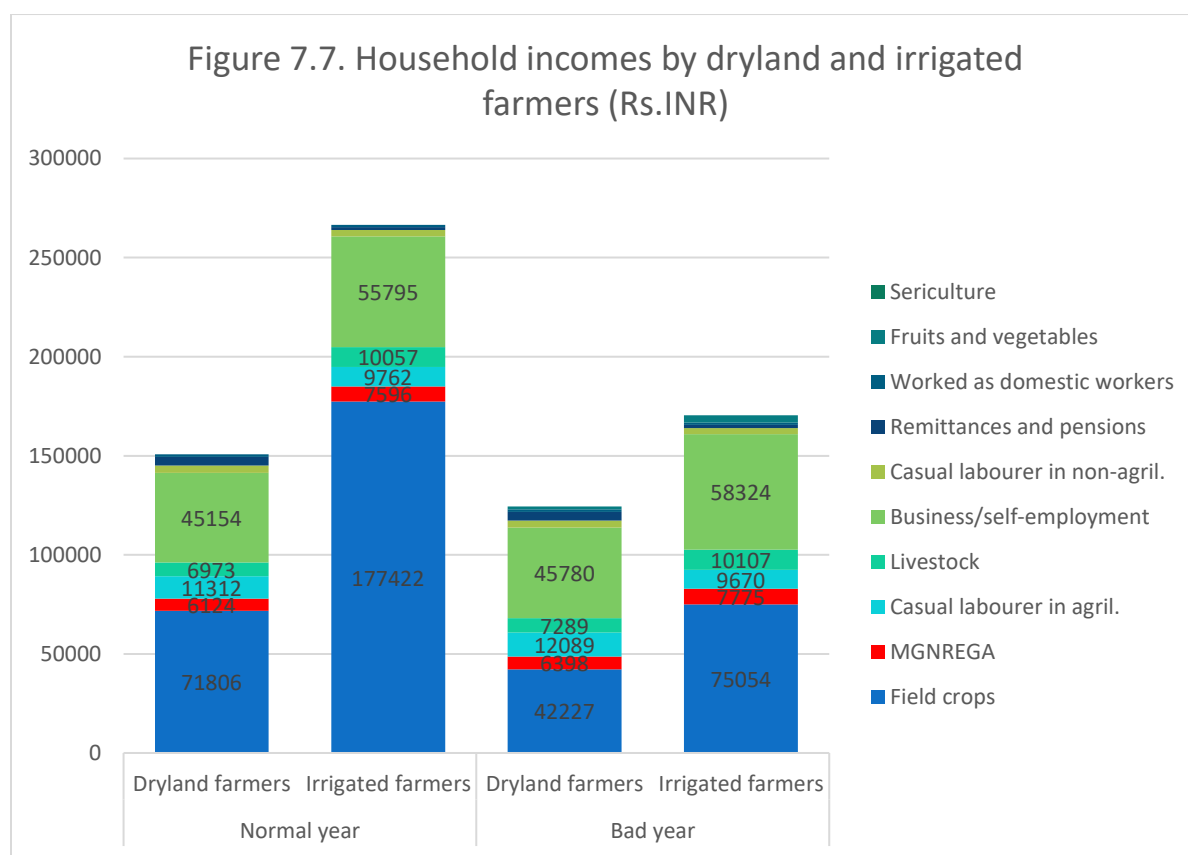


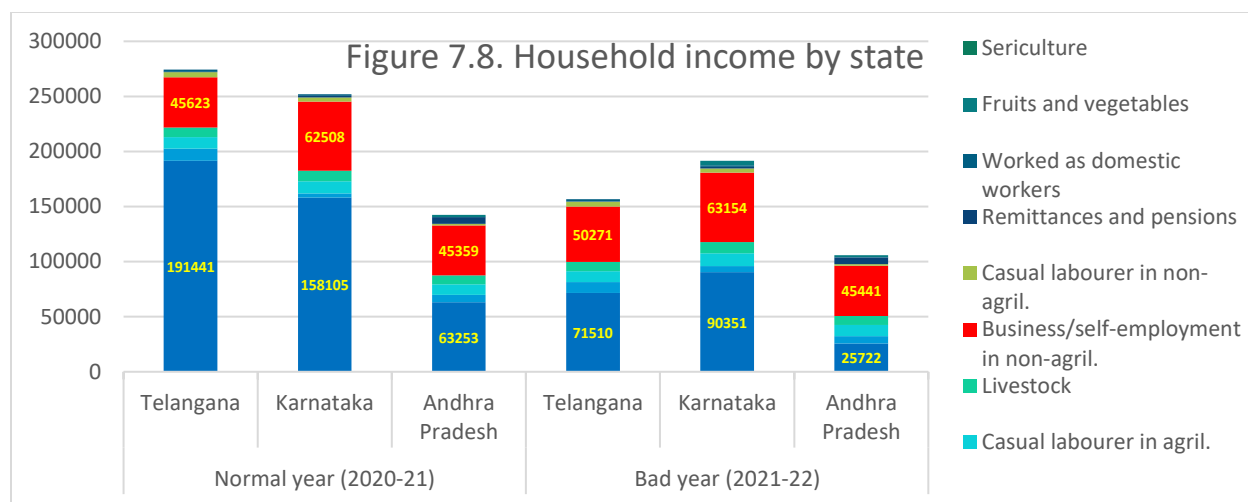
Table 7.15 and 7.16 and Figure 7.7 showed the household income sources by irrigated and dryland farmers among the sample farmers. The household income from all sources except remittances and pensions was higher among irrigated farmers than the dryland farmers. It indicates that irrigation not only increases agricultural incomes, but also expand scope for earnings from all other sources like from public works, casual labourer in agriculture and non-agriculture, self-employed in non-agriculture and livestock both in normal year and also in bad year. Hence, the field results shows that the multiplier effects of increasing irrigation facilities spanning all sectors in rural India in creating income and employment opportunities.

**Table 7.17. Household income (Rs/annum) by state (2020-21)**

State Name	Telangana		Karnataka		Andhra Pradesh		Total	
	Mean	N	Mean	N	Mean	N	Mean	N
Field crops	2,20,047	87	2,10,806	75	1,19,346	53	1,91,456	72
MGNREGA	15,459	72	7,246	53	8,803	73	10,749	66
Casual labourer in agril.	23,801	44	21,352	51	19,223	51	21,310	49
Livestock	21,611	40	29,797	33	27,399	29	25,976	34
Business/self-employment	2,68,372	17	2,50,033	25	1,81,434	25	2,28,350	23
Casual labourer in non-agril.	58,263	8	25,715	15	15,781	10	30,525	11
Remittances and pensions	36,000	1	19,291	7	30,000	20	27,485	9
Worked as domestic workers	95,750	2	51,357	3	8,600	2	49,094	2
Fruits and vegetables		0	2,35,000	0	2,02,500	1	2,13,333	0
Sericulture		0	50,000	0		0	50,000	0
Total hh income	2,74,129	100	2,52,156	100	1,43,035	100	2,22,388	100

**Table 7.18. Household income (Rs/annum) by state (2021-22)**

State Name	Telangana		Karnataka		Andhra Pradesh		Total	
	Mean	N	Mean	N	Mean	N	Mean	N
MGNREGA	13,796	71	10,491	53	8,947	73	11,069	65
Field crops	1,19,183	60	1,39,002	65	85,740	30	1,20,926	52
Casual labourer in agril.	23,233	43	22,756	51	19,724	52	21,804	49
Livestock	21,062	40	30,887	33	28,465	29	26,420	34
Business/self-employment	2,95,709	17	2,52,617	25	1,81,762	25	2,36,293	23
Casual labourer in non-agril.	54,622	8	24,506	15	16,073	10	29,025	11
Remittances and pensions	36,000	1	19,291	7	30,000	20	27,485	9
Worked as domestic workers	94,000	2	52,714	3	8,600	2	47,806	2
Fruits and vegetables		0	3,95,000	1	1,73,200	1	2,71,778	1
Sericulture		0	2,00,000	0		0	2,00,000	0
Total hh income	1,57,223	100	1,90,706	100	1,06,604	100	1,51,431	100



The tables 7.17 , 7.18 and figure 7.8 presents the households income in three states, namely Telangana, Karnataka and Andhra Pradesh in year 2020-21 and 2021-22 respectively. On average households in Telangana earned highest income (Rs.2,74,129) followed by Karnataka (Rs.2,52,156) and the least in Andhra Pradesh (Rs.1,43,035). While in the bad year the incomes reduced to Rs.1,57,223 in Telangana, Rs.1,90,706 in Karnataka and Rs.1,06,604 in Andhra Pradesh. It means, in Telangana incomes were reduced by 43%, in Karnataka by 24% and in Andhra Pradesh by 25%. In normal year, in all sources Telangana households' incomes are more except in livestock, where in Karnataka performed better and remittances and pensions Andhra Pradesh fared better. While in bad year (2021-22), still income from public works, casual labourer in agriculture and non-agriculture, self-employment in non-agriculture is higher in Telangana, still Andhra Pradesh fared better in terms of remittances and pensions as the state government setup a separate local administration through village secretariates for better and universal reach of pensions.



## **Chapter-8**

### **Benefits from government welfare and developmental schemes**

Ending all forms of poverty across the globe is the first goal of the 2030 Sustainable Development Goals (SDGs). Historically, the Universal Declaration of Human Rights of 1948 recognizes the right to social protection in order to make economic growth inclusive. Though the concept of a social safety net dates back to political economists such as Adam Smith, Condorcet, and Turgot (Devereux, S, 2001), with the impending deadline of the SDG target, the time has come to look at the performance of poverty alleviation policies and assess if they truly target and benefit the poor. In response to this, governments across the world are increasing their welfare and development budgets. Similarly, the central and local governments in India have also initiated a plethora of programmes and schemes, mainly to address the needs of the poorer households in the society. Some of these schemes are universal, such as a subsidy on cooking gas, a midday meal scheme for school children, pre- and postnatal care and assistance for women etc., while some specifically target households below the poverty line, such as distribution of food grains at subsidized rates.

Poverty is an extremely complex phenomenon, and it manifests itself in a range of overlapping and interwoven economic, political, and social deprivations (Sen, 2004 and Reddy et al., 2016). The programmes and policies aimed at overcoming deprivation and alleviate poverty need to assess “who” is poor and “why” they are poor. Such programmes also require thoughtful investments both in terms of “how much” to invest and in “how” to invest. Hence, targeted development programmes need to carefully select beneficiary households or individuals to both deliver the maximum impact and to optimally use the funds allocated for them.

Targeting is especially important in countries such as India that are characterised by tight fiscal situations with a large poor population in absolute terms. Given the higher levels of poverty, malnutrition, and underemployment, it has become mandatory for the government to provide income support through subsidies, productive employment opportunities, and social security schemes in rural India (Maiorano, 2014; Patnaik and Das, 2017). Such interventions also include development schemes such as health insurance, subsidised treatments, free education for children, pensions for the elderly and widows, surplus land distribution for the landless, and subsidies to purchase fertilizers, seed, and farm machinery (Debnath et al., 2018). Many of these programmes are supported by multilateral and bilateral donors who strongly hope to contribute to ending poverty in India. Though the central government allocates funds for poverty alleviation, state governments are the key to India’s progress on the SDG Agenda, as they are best placed to ‘put people first’ (Sachs, 2012). To ensure that ‘no one is left behind’, India needs policies that reach its targeted beneficiaries for optimal resource utilization and fulfilment of its goal of poverty eradication.

This paper makes an important contribution to address the host of practical, ethical, and political concerns with respect to beneficiary identification for targeted development schemes in India. The chapter seeks to investigate the effectiveness of targeting mechanisms of various welfare and development schemes in operation in the study area in India. It seeks to understand whether the investments in development and social welfare schemes actually benefit the socially and economically weaker sections the schemes target more than the well-off sections. The list of the welfare and development schemes considered, their eligibility criteria and nature of benefits and amount is given in Table 8.1.

**Table 8.1. List of welfare and development schemes considered in the analysis**

Scheme Name	Eligibility	Benefit/amount
Ration Card	1.The applicant must be a resident of India. 2. The applicant should belong to a poor or economically weaker section of the society. 3. Newly married couples are eligible to apply for a ration card.	Used in distribution of rice, white, sugar, and other applicable materials. 2. Provides free medical assistance in Arogyasree Hospitals
PM-KISAN	1.Small and marginal farmers are eligible for PMKSNY. 2. Farmer families that hold cultivated land can apply for the benefits of this plan. 3. A beneficiary should be an Indian citizen.	Rs.6000
Government health card (AarogyaSree)	Below Poverty Line (BPL) families	The scheme provides financial assistance for the cost of hospitalization, diagnostic tests, surgeries, and other medical procedures related to the treatment of the covered illnesses.
RythuBandhu	1.Telangana State farmers are eligible to get the benefit of Rythu Bandhu Scheme, 2. Farmers who won the farm plot will get benefits of this scheme, 3. Small and margin agricultural labours are eligible for Rythu Bandhu Scheme, 4. Pattadar registered under Forest Rights Record can apply for this scheme	Rs.10000
YSR-RythuBharosa	1. Farmers of Andhra Pradesh, who own cultivated land are eligible under this scheme, 2.As per the government, even those cultivating on endowments/temples/inam lands are eligible.	Rs.7500
LIC/other insurance		
Widow/old age/disability pension	Old age persons, both male and female, who are 60 years of age or above and are destitute. Widow: As per the Marriage Act 18 years and above, Disabled persons having a minimum of 40% disability and No age limit.	Rs.24000 (TS), 30000(AP), 2400 (Karnataka)
RythuBhima	1. The scheme is only applicable to the farmers. 2. To prove their residence, the farmer must possess Domicile certificate of the state under his name. 3. The farmers must belong to the age group of 18-59 years .4. The applicant must own some piece of agricultural land under his/her name.	Rs.5,00,000
Assistance about children's education	all Telangana SC, ST, BC, EBC Minority and Divyanga students	Upto Rs.35,000/- only irrespective of their college fee (If the college fee is less, than the amount will be considered).
Soil Health cards	All farmers in India are eligible for the SHC scheme. They must contact the agriculture department in their region for more	Rs.190
Indira Avasa yojana	Below poverty line households living in the rural areas, belonging to Scheduled Castes/Scheduled tribes, minorities in the BPL category and non SC/ST BPL rural households and registered in BPL List 2002, ex-servicemen and retired members of paramilitary forces fulfilling the other conditions.	Rs.70000
Mid-day meal	Mid Day Meal Scheme by providing every child in every Government and Government assisted Primary School with a prepared midday meal.	1.Children from classes I-VIII will get a nutritious meal every day except the holidays. 2. This scheme ensures children who do not get food at home will have at least one meal a day. 3. Children can get food for free.
Seed Subsidy	All farmers	Depending on crop from 30% to 50% of the seed cost
Ammavadi	1.Must be legal resident of AP, Must be from a BPL household with a white ration card, students studying in a between class 1 and 12 , If child discontinue the study in middle of the session of academic year then he will not be able to avail the benefits of the scheme.	Rs.13,000
Kisan credit cards	1.Famers who are individuals or joint borrowers of the cultivated land and are engaged in farming or related activities. 2. Individual land owners as well as cultivators. 3. Tenant farmers, oral leases, and shared croppers of the cultivated lands. 4. Self-help groups or joint liability groups formed by sharecroppers or tenant farmers	The Kisan Credit Card (KCC) Yojana provides short-term loans to the farmers to meet their urgent expenses arising during the cultivation and for maintaining their farming equipment. It allows farmers to avail of credits at low-interest rates from banks and financial institutions.
ICDC/Anganvadi	1.Children below 6 years, Pregnant & Lactating Mothers (P&LM). 2. Women (15-45 years)	1.To improve the nutritional and health status of children in the age-group 0-6 years. 2. To reduce the incidence of mortality, morbidity, malnutrition and school dropout. 3. Supplementary nutrition. 4.Pre-school non-formal education. 5. Immunization, Health check-up; and Referral services

YSR Cheyutha	1. Women from weaker sections of society such as SC/ST/OBC/Minority Community. 2. The applicant must be above the age of 45 years. An applicant must be below the age of 60 years	Rs.18,750
Risk mitigating (farm pond construction etc)	Only those Farmers or entrepreneurs having land ownership in state shall be eligible for availing assistance under the Schemes	Rs.75,000
KVK/RSK/SAUs/ICAR	All farmers	Providing quality training to the farmers/farmwoman, also conducting Frontline Demonstrations on proven technologies
Kalyanalaxmi/GruhaLaxmi	1.The applying girl should belong to any of the mentioned minority communities or should fall under the below poverty line. 2. The applicant should be a resident of Telangana State. 3. The unmarried girl must have completed 18 years of age at the time of marriage.	Rs.1,00,116
NGOs		Some NGOs are working, but the impact is negligible

**Table 8.2. Reach of government schemes by religion group (% of households) in normal year (2020-21)**

Religion	Hindu	Muslim	Christian	Total
Ration Crad	92.9	98.1	95.7	93.2
PM-KISAN	86.7	80.8	73.9	86.3
Government health card (AarogyaSree)	64.2	51.9	87.0	64.2
RythuBandhu	31.9	19.2	17.4	31.2
YSR-RythuBharosa	29.3	17.3	60.9	29.4
LIC/other insurance	28.8	23.1	8.7	28.3
Widow/old age/disability pension	24.1	17.3	43.5	24.2
Assistance about children's education	15.7	15.4	8.7	15.6
RythuBhima	12.3	0.0	0.0	11.7
Indira Avasa yojana	9.9	15.4	8.7	10.1
Soil Health cards	10.0	5.8	8.7	9.9
Seed Subsidy	8.8	15.4	0.0	8.9
Mid-day meal	8.2	13.5	4.3	8.3
Ammavadi	6.5	5.8	17.4	6.6
Kisan credit cards	5.8	7.7	0.0	5.8
ICDC/Anganvadi	3.9	5.8	0.0	3.9
YSR Cheyutha	2.2	0.0	0.0	2.0
Risk mitigating (farm pond construction etc)	1.4	0.0	0.0	1.3
Kalyanalaxmi/GruhaLaxmi	1.0	0.0	0.0	1.0
KVK/RSK/SAUs/ICAR	1.0	0.0	0.0	0.9
NGOs	0.2	0.0	0.0	0.2

The above tables 8.2 and 8.3 reveals reach of different government schemes in normal year (2020-21) and bad year (2021-22). In the study it was evident that there were more number of beneficiaries for Rythu Bandhu scheme which was an investment support scheme for farmers through which farmers were receiving RS.5000 for both kharif and rabi seasons in study area. The number of beneficiaries for *Rythu Bandhu* was high irrespective of religion, the result showed that 31.9 per cent of beneficiaries for Rythu Bandhu were Hindu, 19.2 per cent were Muslim and 17.4 per cent were Christian farmers.

Further Table 8.2 and 8.3 shows the beneficiaries of different schemes for year 2021 and 2022. There had been very negligible variation among percentage of beneficiaries from *Rythu Bandhu* for 2021 among Hindu farmers 31.5 % for year 2021 compared to year 2020 with 31.9 percentage of Hindu beneficiaries. Percent of Beneficiaries for both the years among 19.2 percent Muslim and 17.4 percent Christian farmers were same.

**Table 8.3. Reach of government schemes (% of hhs) by religion of households in bad year (2021-22)**

Religion	Hindu	Muslim	Christian	Total
Ration Card	93.0	98.1	91.3	93.2
PM-KISAN	86.6	80.8	73.9	86.2
Government health card (AarogyaSree)	66.6	53.8	87.0	66.5
RythuBandhu	31.5	19.2	17.4	30.8
YSR-RythuBharosa	29.4	17.3	65.2	29.6
LIC/other insurance	29.1	21.2	8.7	28.5
Widow/old age/disability pension	24.1	17.3	43.5	24.2
RythuBhima	17.0	7.7	13.0	16.5
Assistance about children's education	15.9	15.4	8.7	15.8
Soil Health cards	10.0	7.7	8.7	9.9
Indira Avasa yojana	9.5	15.4	8.7	9.7
Mid-day meal	9.0	13.5	4.3	9.1
Seed Subsidy	9.0	15.4	0.0	9.1
Ammavadi	6.5	5.8	17.4	6.6
Kisan credit cards	5.9	7.7	0.0	5.8
ICDC/Anganvadi	4.2	5.8	0.0	4.2
YSR Cheyutha	2.2	0.0	0.0	2.0
Risk mitigating (farm pond construction etc)	1.6	0.0	0.0	1.5
KVK/RSK/SAUs/ICAR	1.3	0.0	0.0	1.3
Kalyanalaxmi/GruhaLaxmi	1.3	3.8	0.0	1.3
NGOs	0.2	0.0	0.0	0.2

Tables 8.2 and 8.3 presented religion wise beneficiaries under different government schemes in year 2020-21 and 2021-22 respectively. Pradhan Mantri Kisan Samman Nidhi (PM kisan) was also scheme for farmers income support from central government with high number of beneficiaries in the study areas, under this scheme farmers were provided income support of Rs.6000 for year in three instalments 2000 each time for the year 2020 the highest no of beneficiaries are among Hindu farmers 86.7 per cent, then among Muslim farmers 80.8 per cent, and Christian farmers 73.9 per cent and the beneficiaries among religions were almost same for both years 2020-21 and 2021-22 with 86.6 per cent Hindus , 80.8 per cent Muslims and Christians 73.6 in 2021-22.

Further, Rythu Bheema was farmer's group life insurance scheme for farmers in the study area which had been introduced to provide financial relief and social security to dependents in case of loss of farmers' life with any reason. Among respondents of study area only Hindu farmers 12.3per cent were beneficiaries' of Rythu Bhima and there were no beneficiaries among Muslims and Christian farmer families in years 2020 and Hindu farmers 17.0per cent were beneficiaries'

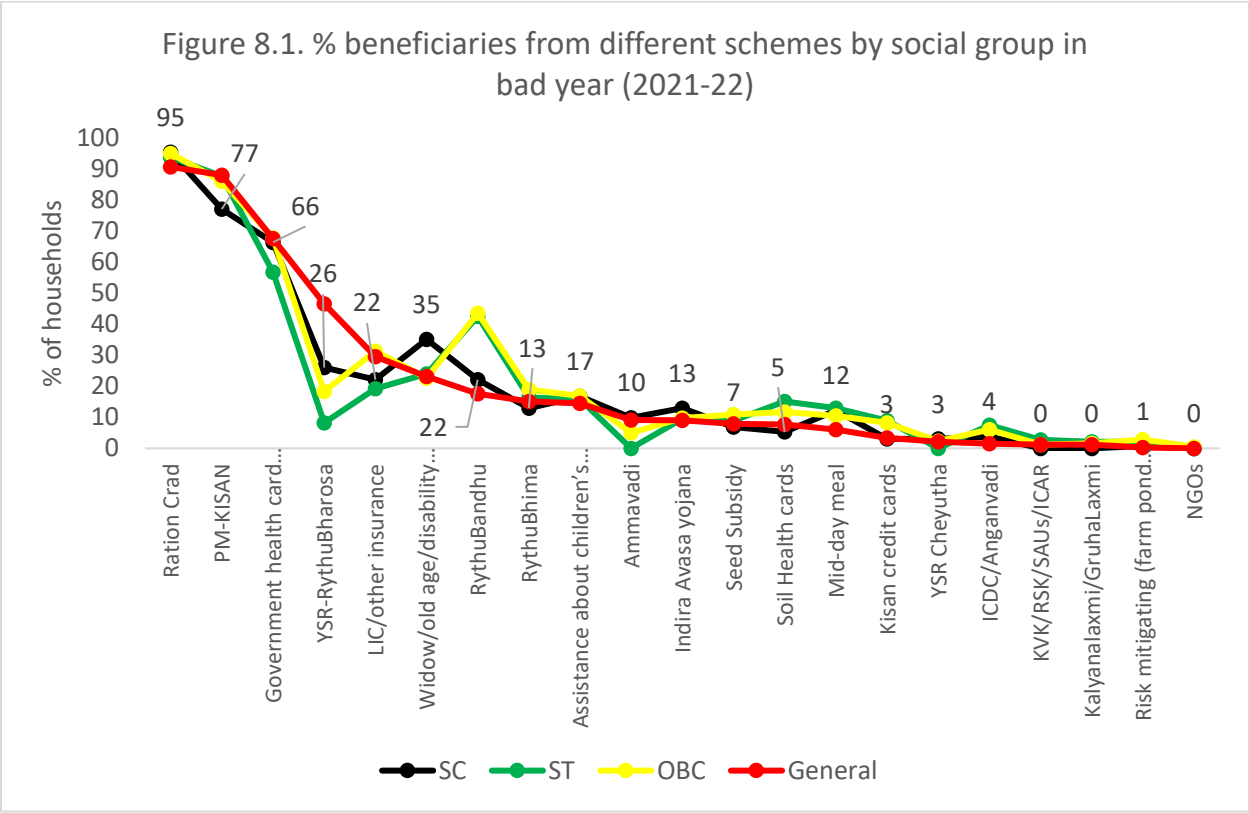
of Rythu Bhima, followed by 13.0 per cent Christian farmers and then 7.7 Muslims farmers in 2021. RythuBandu, PM kisan, Rythu Bhima were the only schemes that were benefiting farmers in study areas, with many other schemes that benefited all villagers in the study area like Ration card, Arogyasree, ICDC anganwadi, midday meals, LIC, assistance to children's education, widow old age/disability pension, assistance from KVK, Kalyanlaxmi /gruhalaxmi, seed subsidy which benefited population of villages as followed:

Ration card was issued by state governments in India to households that are eligible to purchase subsidized food grain from the Public Distribution System under the National Food Security Act (NFSA), In 2021 91.3 per cent of population from Christian religion, 98.1 per cent of Muslims and 93.0 per cent of Hindus were beneficiaries of ration card in the study area. Arogyasree/Govt health card was the scheme of State Government with a mission to provide quality healthcare to the poor. In 2020 87.0 per cent of population from Christian religion, 51.9 per cent of Muslims and 64.2 per cent of Hindus were beneficiaries of ration card in the study area, compared to In 2021 which was same for Christian religion, and had a increase of 53.8 per cent of Muslims and 66.6 per cent of Hindus were beneficiaries in the study area.

Under ICDC /Anganwadi scheme pregnant, lactating women and children of age 1-5 year were getting benefits in the form of nutritious food and education in the villages. Midday meal was given to all the children who were attending government schools in the villages. Kalyanalaxmi/gruhalaxmi was the scheme under which, if daughter from families with income less than 2 lakh gets married the applicant would receive amount of Rs. 1,00,116 as a financial assistance.

**Table 8.4. Government scheme beneficiaries (% of households) by social group in normal year (2020-21)**

Caste	SC	ST	OBC	General	Total
Ration Card	96.2	93.8	95.0	90.5	93.2
PM-KISAN	77.1	88.4	86.3	87.8	86.3
Government health card (AarogyaSree)	62.6	54.8	66.2	64.9	64.2
RythuBandhu	22.1	43.8	44.0	17.7	31.2
YSR-RythuBharosa	25.2	8.2	18.3	46.3	29.4
LIC/other insurance	21.4	17.8	31.3	29.6	28.3
Widow/old age/disability pension	35.1	24.0	22.6	23.2	24.2
Assistance about children's education	16.8	14.4	16.5	14.6	15.6
RythuBhima	9.2	17.1	17.1	5.7	11.7
Indira Avasa yojana	15.3	9.6	10.1	9.0	10.1
Soil Health cards	4.6	15.1	11.6	8.1	9.9
Seed Subsidy	6.9	8.9	10.9	7.4	8.9
Mid-day meal	11.5	11.6	9.4	5.7	8.3
Ammavadi	9.9	0.0	5.0	9.1	6.6
Kisan credit cards	3.1	8.9	8.0	3.4	5.8
ICDC/Anganvadi	3.8	6.8	5.5	1.5	3.9
YSR Cheyutha	3.1	0.0	2.3	2.1	2.0
Risk mitigating (farm pond construction etc)	0.8	1.4	2.7	0.2	1.3
Kalyanalaxmi/GruhaLaxmi	0.8	2.1	1.1	0.7	1.0
KVK/RSK/SAUs/ICAR	0.0	1.4	0.7	1.2	0.9
NGOs	0.0	0.0	0.5	0.0	0.2



Tables 8.4 and figure 8.1 presents the social group wise beneficiaries under different government schemes in year 2020-21 and 2021-22 respectively. There was no much variation in the beneficiaries between normal and bad year. In general, the reach of universal schemes like ration card, PM-KISAN, aarogya sree, Rythu Bandhu, YSR-Rythu Bharosa are reaching more than 90% of the target households. Some slight variation in the percent beneficiaries across social groups. More SC households benefited from widow pensions, Indira Awas Yojana and mid-day meal schemes, showing that socially backward groups are not excluded from these schemes. Kisan Credit Cards and ICDC/Anganvadi are reaching more ST households, indicating again less exclusion error in reaching more vulnerable sections of the society. PM-KISAN, YSR-Rythu Bharosa and Rythu Bandhu are reaching all the social groups equally, as they are land based.

**Table 8.5. Government schemes beneficiaries (% of households) by own land size category in normal year (2020-21)**

	Marginal	Small	Semi-Medium	Medium	Large	Total
Ration Crad	94.0	94.9	96.5	93.1	72.3	93.2
PM-KISAN	62.8	85.5	90.6	92.4	90.1	86.3
Government health card (AarogyaSree)	72.4	69.8	66.5	59.6	41.6	64.2
RythuBandhu	28.6	39.6	37.6	25.5	8.9	31.2
YSR-RythuBharosa	25.6	29.4	29.5	31.4	27.7	29.4
LIC/other insurance	25.6	26.7	28.7	27.5	39.6	28.3
Widow/old age/disability pension	31.7	23.5	21.2	26.0	16.8	24.2
Assistance about children's education	21.6	14.5	14.7	16.4	6.9	15.6
RythuBhima	12.6	12.5	15.1	9.1	3.0	11.7
Indira Avasa yojana	10.1	15.7	12.0	6.4	2.0	10.1
Soil Health cards	5.0	9.0	10.9	11.8	8.9	9.9
Seed Subsidy	6.0	5.1	8.1	10.8	19.8	8.9
Mid-day meal	11.1	13.7	7.0	5.6	5.9	8.3
Ammavadi	9.0	5.9	5.7	8.1	2.0	6.6
Kisan credit cards	2.5	5.9	5.0	7.1	9.9	5.8
ICDC/Anganvadi	6.0	4.7	2.8	3.4	4.0	3.9
YSR Cheyutha	4.0	1.6	1.8	2.0	1.0	2.0
Risk mitigating (farm pond construction etc)	1.0	1.2	1.8	1.2	1.0	1.3
Kalyanalaxmi/GruhaLaxmi	1.5	1.6	0.9	0.5	1.0	1.0
KVK/RSK/SAUs/ICAR	0.5	0.8	0.7	1.2	2.0	0.9
NGOs	0.5	0.0	0.2	0.2	0.0	0.2

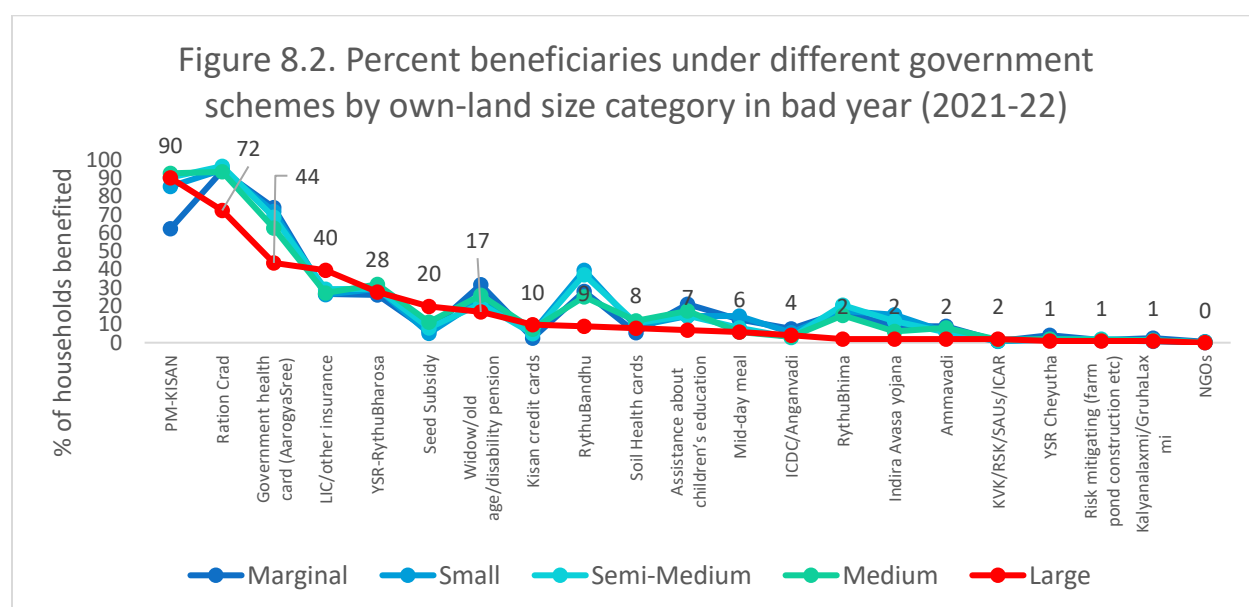


Table 8.5 and figure 8.2 presents the percent beneficiaries by own-land size categories classified as marginal, small, semi-medium, medium and large farmers. Reach of PM-KISAN was increased with land size, while

reach of ration cards decreased. Reach of Aarogyasree, pensions, children educational assistance, ammavadi, ICDC/Anganvadi and YSR-Cheyutha are more among marginal landholders, achieving the social objective of reaching unreachable. Overall, reach of schemes like information dissemination through KVK/SAUs/ICAR institutions, farm pond construction, YSR-Cheyutha, ICDC/Anganvadi is low among all categories of the households. The share of large land owners was less in getting benefits from ration card, Aarogya Sree indicating automatic exclusion from these schemes by the large landowning class. It is also to be noted that PM-KISAN, YSR-Rythu Bharosa, which are land based, also reaching significantly poorest of the poor.

**Table 8.6. % beneficiaries of schemes by land cultivated size category in normal year (2020-21)**

Scheme	Marginal	Small	Semi-Medium	Medium	Large	Total
Ration Card	90.0	94.9	97.1	93.9	84.5	93.2
PM-KISAN	90.0	83.1	86.2	87.2	85.8	86.3
Government health card (AarogyaSree)	72.5	66.2	66.3	63.4	57.3	64.2
RythuBandhu	48.8	40.0	38.6	26.1	15.9	31.2
YSR-RythuBharosa	28.8	19.5	26.3	34.4	32.3	29.4
LIC/other insurance	18.8	23.6	25.1	29.1	39.7	28.3
Widow/old age/disability pension	32.5	23.1	25.6	24.3	19.4	24.2
Assistance about children's education	16.3	11.3	14.0	19.0	14.2	15.6
RythuBhima	18.8	14.4	15.2	9.7	5.2	11.7
Indira Avasa yojana	13.8	13.3	11.3	9.9	4.3	10.1
Soil Health cards	6.3	10.8	10.6	9.7	9.5	9.9
Seed Subsidy	7.5	6.7	7.1	8.7	14.7	8.9
Mid-day meal	7.5	12.3	7.9	7.7	7.3	8.3
Ammavadi	5.0	2.6	4.9	10.1	6.0	6.6
Kisan credit cards	5.0	6.2	5.7	5.1	7.3	5.8
ICDC/Anganvadi	5.0	4.6	2.9	4.5	3.0	3.9
YSR Cheyutha	2.5	0.5	2.9	1.6	2.6	2.0
Risk mitigating (farm pond construction etc)	1.3	0.5	1.7	1.4	1.3	1.3
Kalyanalaxmi/GruhaLaxmi	2.5	1.5	1.0	0.8	0.4	1.0
KVK/RSK/SAUs/ICAR	1.3	1.0	0.5	1.2	0.9	0.9
NGOs	0.0	0.0	0.5	0.2	0.0	0.2



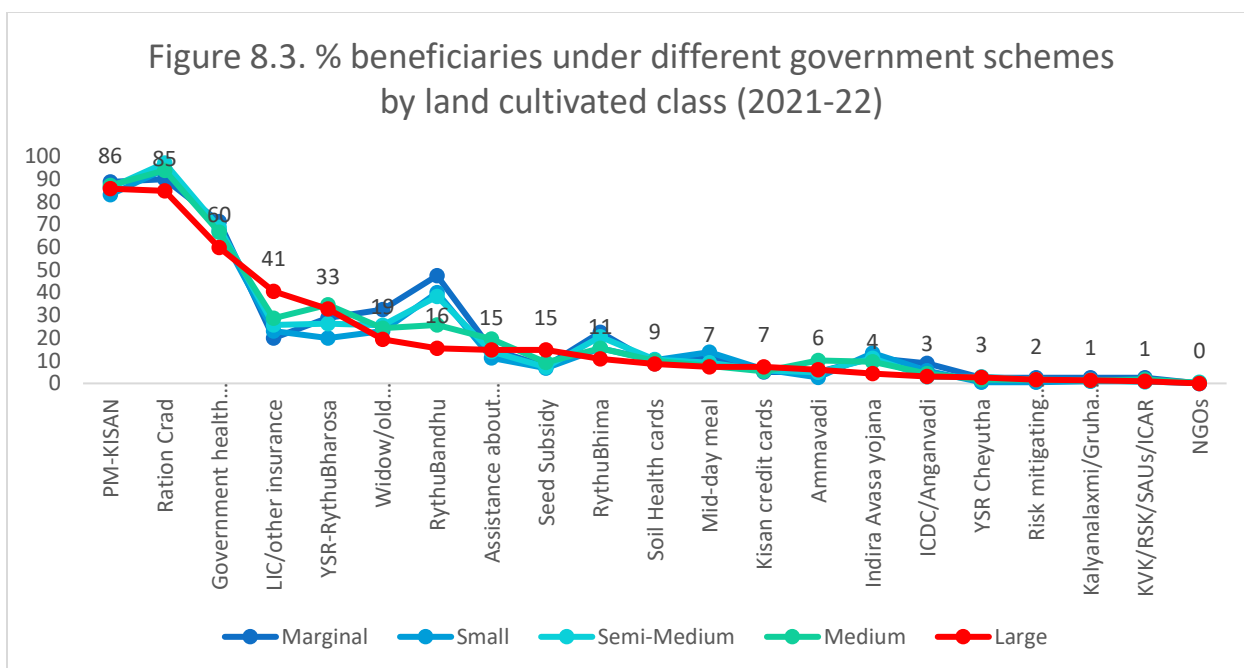


Table 8.7. Reach of government schemes by poverty status (% of households benefited)

Schemes	BPL2021			BPL2022		
	Non-poor	Poor	Total	Non-poor	Poor	Total
Ration Crad	92.9	93.6	93.2	93.8	92.5	93.2
PM-KISAN	86.6	85.6	86.3	86.6	85.9	86.3
Government health card (AarogyaSree)	63.2	66.1	64.2	62.1	66.5	64.2
Rythu Bandhu	36.7	20.1	31.2	31.9	30.4	31.2
YSR-Rythu Bharosa	25.1	37.9	29.4	26.6	32.5	29.4
LIC/other insurance	32.6	19.7	28.3	30.3	26.0	28.3
Widow/old age/disability pension	25.8	20.8	24.2	26.0	22.1	24.2
Assistance about children's education	16.5	13.8	15.6	15.6	15.5	15.6
Rythu Bhima	14.3	6.4	11.7	12.1	11.3	11.7
Indira Avasa yojana	11.5	7.2	10.1	11.0	9.0	10.1
Soil Health cards	10.9	7.8	9.9	9.1	10.7	9.9
Seed Subsidy	8.0	10.6	8.9	9.1	8.6	8.9
Mid-day meal	7.7	9.5	8.3	8.3	8.3	8.3
Ammavadi	6.6	6.6	6.6	6.6	6.6	6.6
Kisan credit cards	6.6	4.0	5.8	6.8	4.7	5.8
ICDC/Anganvadi	4.3	3.0	3.9	3.7	4.1	3.9
YSR Cheyutha	2.0	2.1	2.0	2.8	1.2	2.0
Risk mitigating (farm pond construction etc)	2.0	0.0	1.3	0.8	2.0	1.3
Kalyanalaxmi/ GruhaLaxmi	1.1	0.8	1.0	1.3	0.6	1.0
KVK/RSK/SAUs/ICAR	1.2	0.4	0.9	0.5	1.4	0.9
NGOs	0.3	0.0	0.2	0.1	0.3	0.2

The tables 8.6 and figure 8.3 presented the percent beneficiaries under different government schemes by land cultivated categories in year 2020-21 and 2021-22 respectively. The ration card, PM-KISAN and Aarogya sree are considered as universal schemes as their reach was higher than 65% in general across all land-size categories. The reach of ration card is having inverted “u” shape relationship with land size, while PM-KISAN is not having any relationship with land size category, once the household is having some agricultural land irrespective of land size, they are eligible and all gets same benefits that is Rs.6,000 per household. Aarogya Sree also becoming a universal reach as all the households who had BPL ration card are automatically eligible under Aarogya Sree. Now all the private hospitals are accepting Aarogya Sree cards for admission. The reach of schemes implemented by Andhra Pradesh state government is almost perfect in many schemes, as they have a separate administrative mechanism under Village Secretariate and Rythu Bharosa Kendra to reach every household and enrol under different schemes for getting benefits.

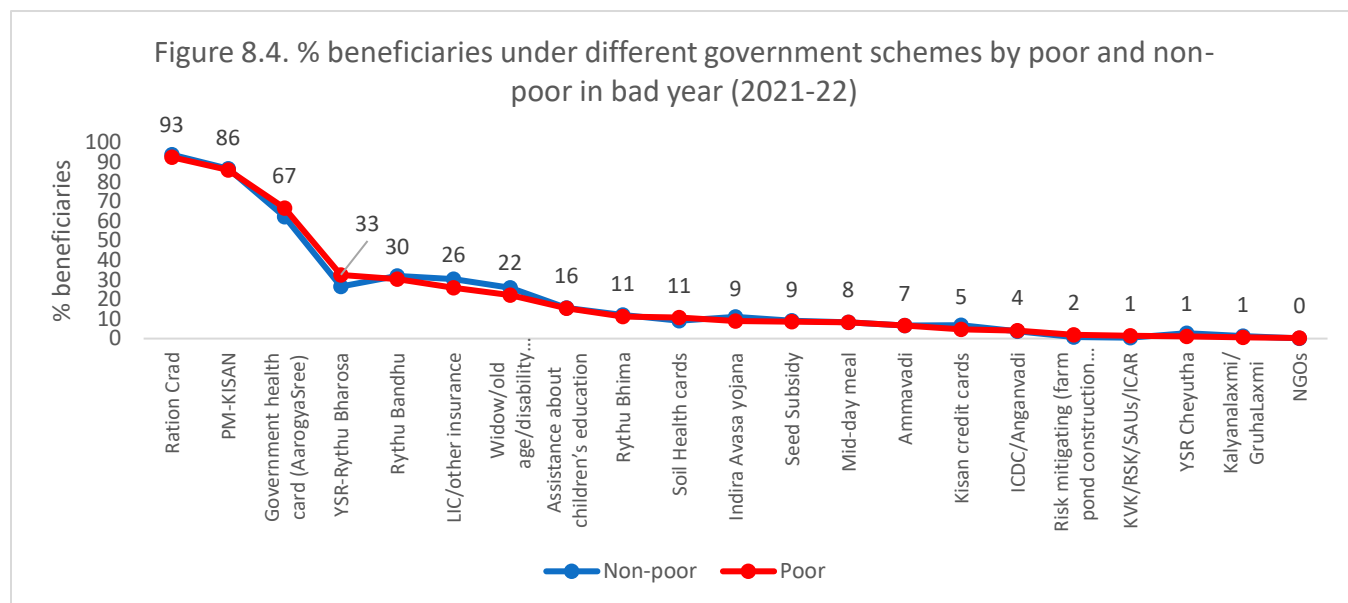


Table 8.7 and figure 8.4 shows beneficiaries of schemes based on BPL farmers in normal and bad years. It appears that among the farmers in the study area, non-poor farmers were more benefited compared to poor farmers. Central, state and local governments are implementing several welfare and development schemes to alleviate poverty and improve the living conditions of the poorest sections of society. However, there are several hurdles that prevent the poorest from availing these benefits. Some of the major hurdles are:

**Lack of awareness:** The poorest sections of society are often unaware of the various welfare and development schemes implemented by governments. They may not have access to information about how to apply for these schemes or the benefits they can avail. This lack of awareness results in a significant portion of the poorest being left out of these schemes.

**Complex application process:** The application process for welfare and development schemes is often complex, requiring several documents and verification processes. For many of the poorest, who may not have access to these documents or the resources to complete the application process, this becomes a significant hurdle in availing the benefits.

**Corruption and middlemen:** Corruption and the involvement of middlemen in the application and verification process is a significant hurdle for the poorest in availing the benefits of these schemes. Middlemen often demand bribes or commissions for facilitating the application process or verification, making it difficult for the poorest to access these schemes.

**Limited reach of schemes:** The implementation of welfare and development schemes is often limited to certain regions or sections of society, leaving out many of the poorest sections. The poorest, who are often located in remote areas, may not have access to the benefits of these schemes due to limited outreach.

**Inadequate infrastructure:** Inadequate infrastructure and resources, such as lack of proper transport, internet connectivity, or banking facilities, also pose a significant hurdle for the poorest in availing the benefits of these schemes. They may not be able to reach the offices or apply for the schemes due to the lack of infrastructure.

Addressing these hurdles is critical in ensuring that the poorest sections of society are able to avail the benefits of welfare and development schemes and improve their living conditions. Enhancing the reach of welfare and development schemes to the poorest sections of society is critical in ensuring that they are able to avail the benefits and improve their living conditions. Here are some ways to enhance the reach of these schemes:

**Awareness campaigns:** Conducting awareness campaigns in rural and remote areas can help educate the poorest sections about the various welfare and development schemes implemented by the government. These campaigns can use various communication channels, such as radio, television, and mobile phones, to reach a wider audience.

**Simplified application process:** Simplifying the application process for welfare and development schemes can help the poorest sections to easily apply and avail the benefits. This can be done by reducing the number of documents required, simplifying the verification process, and providing assistance to those who need it.

**Digitization of services:** Digitizing the application and verification process can significantly enhance the reach of welfare and development schemes to the poorest sections. This can be done by providing online application facilities, mobile-based applications, and digital verification mechanisms.

**Targeted schemes:** Implementing targeted schemes that focus on the specific needs of the poorest sections of society can help enhance the reach of welfare and development schemes. For instance, schemes that focus on providing housing, healthcare, and education to the poorest sections can be implemented.

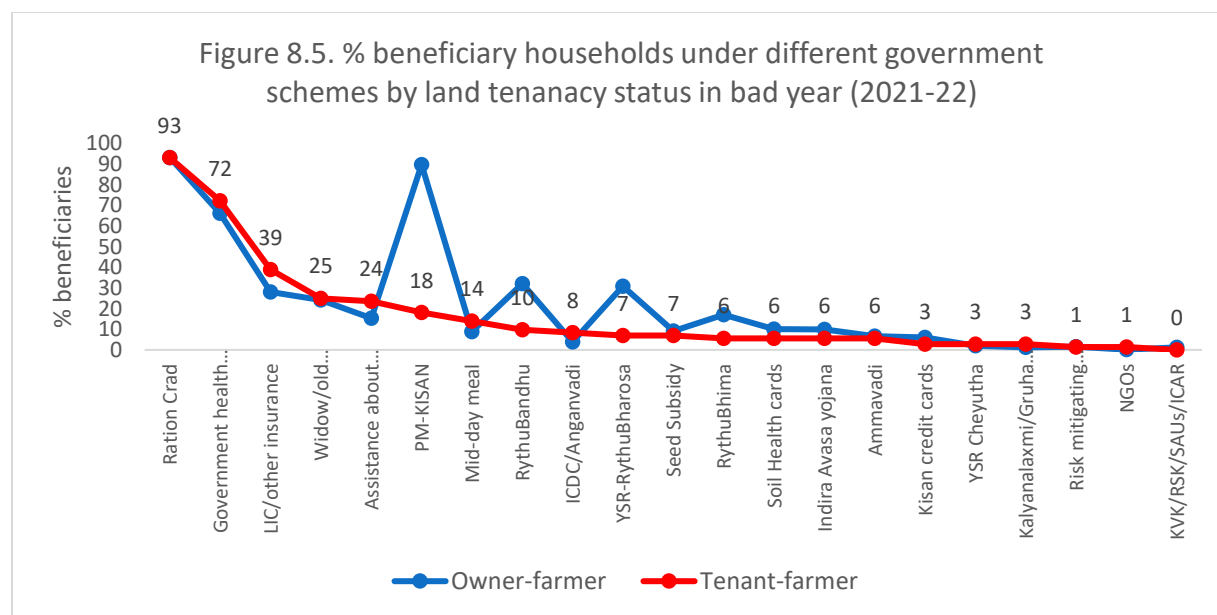
**Community participation:** Involving the local community in the implementation and monitoring of welfare and development schemes can help enhance the reach of these schemes. Local community members can act as facilitators and help in spreading awareness and assisting the poorest sections in availing the benefits.

**Robust monitoring and evaluation:** Robust monitoring and evaluation mechanisms can help identify gaps in the implementation of welfare and development schemes and take corrective measures to enhance their reach. This can be done by using digital platforms for monitoring and evaluation, involving independent third-party auditors, and conducting regular reviews and feedback sessions.

Enhancing the reach of welfare and development schemes to the poorest sections of society requires a concerted effort by the government, civil society, and the private sector. A multi-pronged approach that involves the above measures can significantly improve the living conditions of the poorest sections and enhance their socio-economic development.

**Table 8.8. Government Schemes beneficiaries (% of households) by land tenancy status**

Scheme	2020-21			2021-22		
	Owner-farmer	Tenant farmer	Total	Owner-farmer	Tenant farmer	Total
Ration Crad	93.2	93.1	93.2	93.2	93.1	93.2
PM-KISAN	89.9	18.1	86.3	89.8	18.1	86.2
Government health card (AarogyaSree)	63.9	68.1	64.2	66.2	72.2	66.5
Rythu Bandhu	32.3	9.7	31.2	32.0	9.7	30.8
YSR-Rythu Bharosa	30.6	5.6	29.4	30.8	6.9	29.6
LIC/other insurance	27.8	37.5	28.3	28.0	38.9	28.5
Widow/old age/disability pension	24.1	25.0	24.2	24.1	25.0	24.2
Assistance about children's education	15.1	23.6	15.6	17.1	5.6	16.5
Rythu Bhima	12.2	2.8	11.7	15.4	23.6	15.8
Indira Avasa yojana	10.3	5.6	10.1	10.1	5.6	9.9
Soil Health cards	10.1	5.6	9.9	9.9	5.6	9.7
Seed Subsidy	9.0	6.9	8.9	8.8	13.9	9.1
Mid-day meal	8.0	13.9	8.3	9.2	6.9	9.1
Ammavadi	6.7	5.6	6.6	6.7	5.6	6.6
Kisan credit cards	5.9	2.8	5.8	6.0	2.8	5.8
ICDC/Anganvadi	3.6	8.3	3.9	3.9	8.3	4.2
YSR Cheyutha	2.0	2.8	2.0	2.0	2.8	2.0
Risk mitigating (farm pond construction etc)	1.3	1.4	1.3	1.6	1.4	1.5
Kalyanalaxmi/GruhaLaxmi	0.9	2.8	1.0	1.3	0.0	1.3
KVK/RSK/SAUs/ICAR	1.0	0.0	0.9	1.3	2.8	1.3
NGOs	0.1	1.4	0.2			



Tenant farmers in India often face significant challenges in accessing welfare and development schemes due to their status as tenants and the lack of proper documentation. Table 8.8 and figure 8.5 shows the percent of beneficiaries under different welfare and development schemes in normal and bad years. From the above tables and figure, it can be observed that in general, in all the schemes, beneficiary percent among the tenant-farmers is less than the owner-farmer. For example, percent of tenant farmers benefited from PM-KISAN, Rythu Bandhu, YSR-Rythu Bharosa, Rythu Bhima are particularly low, as they are all linked to land-ownership. Similarly, Indira Awas Yojana (housing scheme), Soil Health card Scheme, seed subsidy is directly or indirectly linked to having some sort of land. Benefits from ICDC/Anganvadi, mid-day meal and children's education schemes are more among tenant farmers, as they are particularly targeted to poorest of the poor. Tenant farmers in India face several challenges in availing benefits from government schemes. Here are some of the problems faced by tenant farmers:

**Lack of land tenure rights:** Tenant farmers do not have ownership rights over the land they cultivate. As a result, they are often excluded from government schemes that require land ownership as a prerequisite.

**Lack of documentation:** Tenant farmers may not have the required documentation, such as land records, to prove their tenancy rights. This can result in exclusion from government schemes that require documentation as proof of eligibility.

**Limited awareness:** Tenant farmers may not be aware of the various government schemes available to them. Lack of information and knowledge about the schemes can prevent them from availing the benefits.

**Cumbersome application process:** The application process for government schemes can be cumbersome, requiring multiple documents and visits to government offices. Tenant farmers, who may have limited resources and time, may find it difficult to navigate the process.

**Corruption:** Corruption in the implementation of government schemes can prevent tenant farmers from availing the benefits. They may be required to pay bribes or face delays in processing their applications.

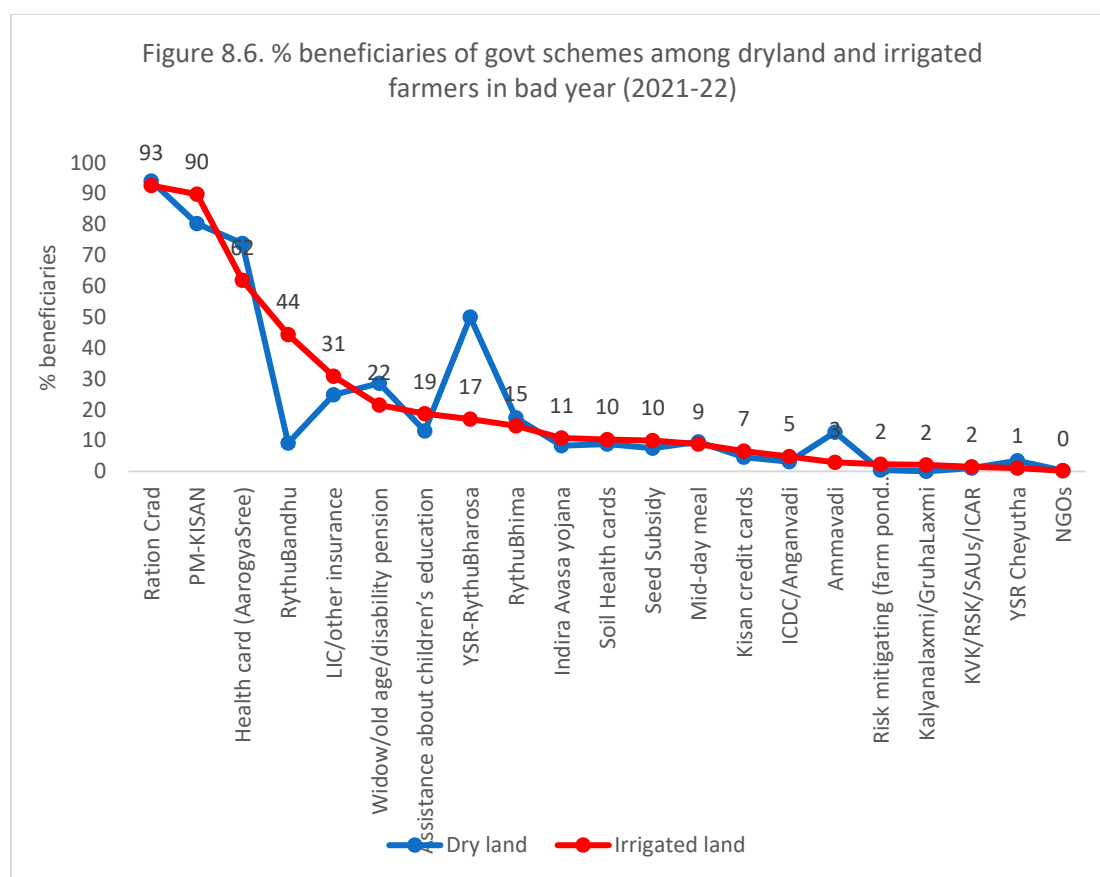
**Lack of targeted schemes:** Many government schemes are not targeted towards the specific needs of tenant farmers. As a result, they may not be able to avail the benefits that are relevant to their needs.

**Limited access to credit:** Tenant farmers may have limited access to credit, which can prevent them from investing in their farms and improving their productivity. This can limit their ability to avail benefits from government schemes that require investment in farming activities.

Addressing these challenges will require a concerted effort from the government, civil society organizations, and other stakeholders. Efforts must be made to improve the documentation process, simplify the application process, increase awareness, and implement targeted schemes that cater to the specific needs of tenant farmers. Additionally, efforts must be made to reduce corruption in the implementation of government schemes and increase access to credit for tenant farmers.

**Table 8.9. % beneficiaries (% of hhs) under government schemes by dryland and irrigated farmers**

Schemes	2020-21			2021-22		
	Dry land	Irrigated land	Total	Dry land	Irrigated land	Total
Ration Crad	93.9	92.7	93.2	94.1	92.6	93.2
PM-KISAN	80.1	90.1	86.3	80.3	89.8	86.2
Government health card (AarogyaSree)	71.0	59.9	64.2	73.9	61.9	66.5
RythuBandhu	9.4	44.7	31.2	9.2	44.3	30.8
YSR-RythuBharosa	49.6	16.8	29.4	50.0	16.9	29.6
LIC/other insurance	24.4	30.7	28.3	24.8	30.8	28.5
Widow/old age/disability pension	28.5	21.5	24.2	28.5	21.5	24.2
Assistance about children's education	17.6	14.3	15.6	13.1	18.7	16.5
RythuBhima	3.3	16.9	11.7	17.3	14.8	15.8
Indira Avasa yojana	8.8	10.8	10.1	8.3	10.8	9.9
Soil Health cards	8.3	10.8	9.9	8.8	10.3	9.7
Seed Subsidy	9.4	8.6	8.9	7.5	10.0	9.1
Mid-day meal	7.5	8.8	8.3	9.6	8.8	9.1
Ammavadi	12.9	2.7	6.6	12.7	2.9	6.6
Kisan credit cards	4.6	6.5	5.8	4.6	6.6	5.8
ICDC/Anganvadi	3.1	4.3	3.9	3.1	4.8	4.2
YSR Cheyutha	3.5	1.1	2.0	3.5	1.1	2.0
Risk mitigating (farm pond construction etc)	0.4	1.9	1.3	0.4	2.3	1.5
Kalyanalaxmi/GruhaLaxmi	1.1	0.9	1.0	0.0	2.1	1.3
KVK/RSK/SAUs/ICAR	0.0	1.5	0.9	1.1	1.5	1.3
NGOs	0.2	0.2	0.2	0.2	0.2	0.2



Tables 8.9 and figure 8.6 shows the percent beneficiaries from various welfare and development schemes among dryland and irrigated farmers in both normal (2020-21) and bad year (2021-22). Although there is no much difference between dryland and irrigated farmers in accessing the benefits from government welfare and development schemes, there are some hidden hurdles in accessing the benefits by dryland farmers. For example, irrigation and fertilizer subsidies (like free electricity for pumping ground water, fertilizer subsidy, wherein irrigated farmers use more than 2-3 times that of dryland farmers). Dryland farmers in India face several problems, including:

**Dependence on rainfall:** Dryland farmers depend on rainfall for crop cultivation, and they face crop failures and reduced yields during periods of drought or inadequate rainfall.

**Lack of irrigation facilities:** Dryland farmers have limited access to irrigation facilities, and they often rely on rainwater harvesting techniques to store water for irrigation during dry spells. It is also very clear that most of the dryland farmers don't have water harvesting structures and entirely dependent on rainwater for crop growth.

**Poor soil fertility:** Soil fertility in dryland areas is often poor, which can lead to reduced crop yields and poor-quality crops.

**Limited access to credit:** Dryland farmers may have limited access to credit from banks or other financial institutions, which can limit their ability to invest in their farms and improve their livelihoods.

Limited access to markets: Dryland farmers often face difficulties in accessing markets for their produce, as transportation and storage facilities may be limited due scattered and thin distribution of dryland crops.

Lack of agricultural infrastructure: Many dryland areas lack basic agricultural infrastructure such as roads, warehouses, and processing facilities, which can make it difficult for farmers to transport their crops and sell them at fair prices.

Limited knowledge and awareness: Many dryland farmers lack knowledge and awareness of modern agricultural practices and techniques, which can limit their ability to improve their crop yields and income.

Climate change: Climate change is increasing the frequency and intensity of extreme weather events, such as droughts and floods, which can have devastating impacts on dryland farmers.

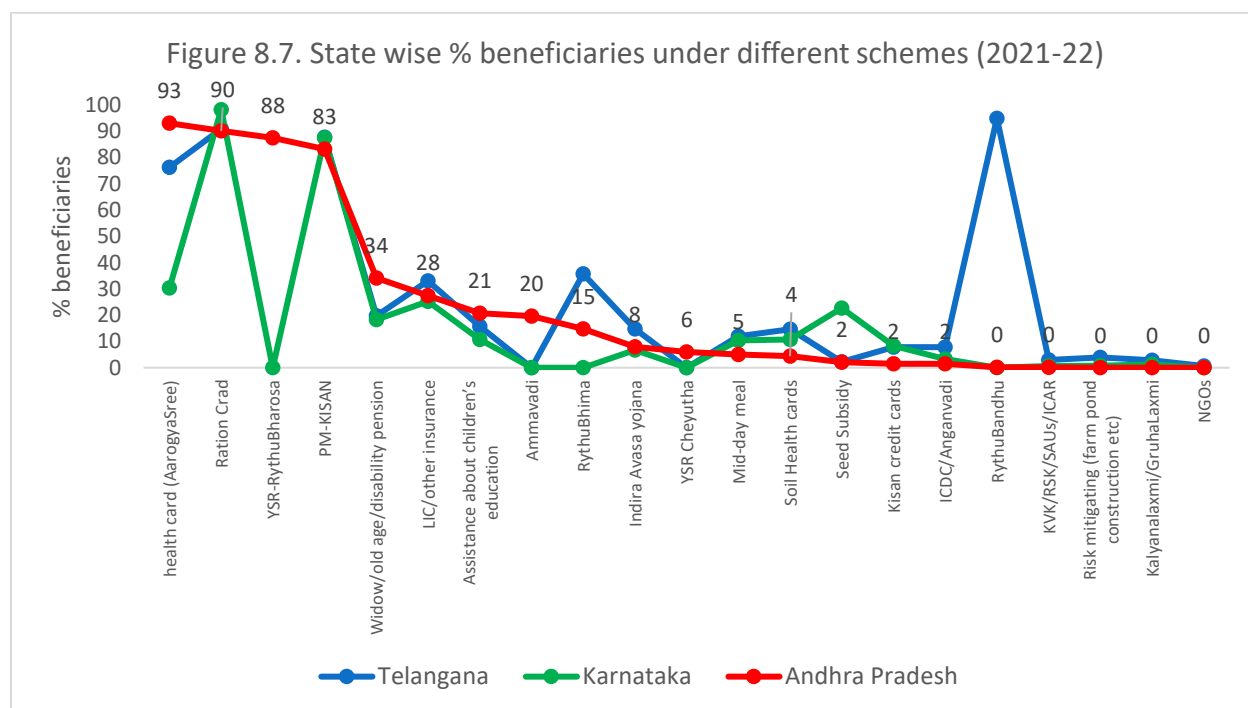
To address these challenges, there is a need for government policies and programs that focus on the specific needs of dryland farmers, including investments in irrigation facilities, soil health, and agricultural infrastructure. Improving access to credit, markets, and information and training on modern agricultural practices can also help to improve the livelihoods of dryland farmers. Additionally, community-level organizations and NGOs can play a crucial role in supporting dryland farmers and facilitating their access to resources and information.

**Table 8.10. % beneficiaries under different government schemes by state in normal year (2020-21)**

State Name	Telangana	Karnataka	AP	Total
Ration Crad	91.1	98.3	90.0	93.2
PM-KISAN	88.5	87.5	82.9	86.3
Government health card (AarogyaSree)	75.9	30.2	86.9	64.2
RythuBandhu	95.9	NA	0.4	31.2
YSR-RythuBharosa	NA	NA	86.9	29.4
LIC/other insurance	33.0	24.8	27.3	28.3
Widow/old age/disability pension	19.8	18.3	34.2	24.2
Assistance about children's education	15.2	10.6	20.8	15.6
RythuBhima	35.9	NA	0.2	11.7
Indira Avasa yojana	15.4	6.7	8.3	10.1
Soil Health cards	14.1	11.3	4.4	9.9
Seed Subsidy	2.0	22.3	2.1	8.9
Mid-day meal	9.3	10.4	5.2	8.3
Ammavadi	NA	NA	19.6	6.6
Kisan credit cards	7.8	8.1	1.5	5.8
ICDC/Anganvadi	7.0	3.3	1.5	3.9
YSR Cheyutha	NA	NA	6.0	2.0
Risk mitigating (farm pond construction etc)	3.3	0.8	0.0	1.3
Kalyanalaxmi/GruhaLaxmi	1.3	1.7	0.0	1.0
KVK/RSK/SAUs/ICAR	2.0	0.6	0.2	0.9
NGOs	0.7	0.0	0.0	0.2



Note: NA=Not applicable. The schemes are not implemented in these states, they are specific to a particular state



The above table 8.10 and figure 8.7 shows the state wise percent of beneficiaries under different government schemes. The ration card, PM-KISAN, Aarogya sree, LIC/other life insurance schemes, various types of pensions, Indiria Awas Yojana, Soil Health Card scheme are universal schemes under central government sponsored schemes, they are implemented by all the states. However, some schemes like Rythu Bhandu and Rythi Bhima implemented only in Telangana state, while YSR-Rythu Bharosa, Ammavadi, YSR-Cheyutha and exclusively implemented in Andhra Pradesh, similarly some schemes are specific to Karnataka state. Some schemes are targeted to specific group (like Rythu Bandhu, Rythu Bhima and YSR-Rythu Bharosa are targeted to reach all farmers owning land), while some others are targeted to Below Poverty Line(BPL) households like ration card, Aatogya sree. However, all these schemes are subjected to inclusion and exclusion error. Inclusion and exclusion errors are common in government schemes that are designed to provide benefits or support to specific groups of people. Inclusion errors occur when ineligible people are included in the scheme, while exclusion errors occur when eligible people are excluded from the scheme. Inclusion errors can occur due to various reasons, such as faulty data or poor implementation of eligibility criteria. For example, if the government scheme is designed to provide benefits to poor households, but the list of beneficiaries includes some non-poor households, this would be an inclusion error. Exclusion errors can also occur due to various reasons, such as incomplete or outdated data or inadequate outreach efforts. For example, if the government scheme is designed to provide benefits to all farmers, but some eligible farmers are not aware of the scheme or face administrative hurdles in accessing it, this would be an exclusion error. Both inclusion and exclusion errors can have negative consequences. Inclusion errors can lead to wastage of resources and dilution of benefits for the intended beneficiaries. Exclusion errors, on the other hand, can lead to underutilization of resources and failure to achieve the intended goals of the scheme.

To minimize inclusion and exclusion errors, the government can take various measures, such as:

Improving data quality and accuracy to ensure that only eligible beneficiaries are included in the scheme.

Strengthening the implementation and monitoring of eligibility criteria to prevent ineligible beneficiaries from receiving benefits.

Conducting regular outreach and awareness campaigns to ensure that eligible beneficiaries are aware of the scheme and how to access it.

Simplifying the application and approval process to reduce administrative hurdles and ensure timely access to benefits.

Encouraging community-level participation and involvement to ensure that the scheme is reaching the intended beneficiaries.

Establishing grievance redressal mechanisms to address any complaints or issues that may arise during the implementation of the scheme.

By minimizing inclusion and exclusion errors, the government can ensure that its schemes are more effective and efficient in achieving their intended goals of improving the welfare and livelihoods of the targeted beneficiaries. To increase the reach of government schemes to the poorest in rural India, the government needs to take several steps. These include simplifying eligibility criteria and procedures, improving implementation, increasing transparency, reducing corruption, and providing access to information. The government also needs to work towards addressing social and cultural barriers to ensure that the poorest communities are included in these schemes. Additionally, civil society organizations and non-governmental organizations (NGOs) can play an important role in reaching out to the poorest and helping them avail of the benefits of government schemes.

## **Chapter-9**

### **Indebtedness of households**

The issue of farmer indebtedness is a significant problem in India, particularly in rural areas where agriculture is the main source of livelihood. Many farmers in India rely on credit from banks and other financial institutions to meet their farming expenses, such as purchasing seeds, fertilizers, and equipment. However, factors such as unpredictable weather conditions, low crop yields, and market fluctuations can make it challenging for farmers to repay their loans. As a result, many farmers become trapped in a cycle of debt, taking out additional loans to pay off existing ones, and accruing high levels of interest. According to a report by the National Bank for Agriculture and Rural Development (NABARD), the average indebtedness of agricultural households in India was Rs. 74,121 in 2019-20. The report also noted that 52% of agricultural households were indebted, with the highest levels of indebtedness in states like Telangana, Andhra Pradesh, and Tamil Nadu.

Various measures have been taken by the government and other organizations to address the issue of farmer indebtedness, such as loan waivers, debt restructuring, and financial literacy programs. However, the problem persists, and more needs to be done to provide farmers with the support they need to break the cycle of debt and improve their livelihoods.

It is important to note that in India, agriculture is the primary source of income for people of various religions, including Hindus, Muslims, Sikhs, Christians, and others. Therefore, it is unlikely that the indebtedness of farmers can be attributed to their religious affiliation. However, the National Sample Survey (NSS) has conducted surveys in the past that have provided data on the indebtedness of households by religion. According to the NSS survey conducted in 2013, the percentage of indebted households was highest among Sikh households (67.8%), followed by Hindu households (52.9%), Muslim households (50.7%), and Christian households (35.7%). It is important to note that the reasons for this disparity in indebtedness across different religious groups are complex and cannot be attributed solely to religious factors. Factors such as land ownership, access to credit, and other socio-economic factors may also play a role. The details of the indebtedness of sample households by religion are given in table 9.1 and 9.2.

**Table 9.1. Indebtedness (Rs) of households by religion in normal year (2020-21)**

Religion	Hindu		Muslim		Christian		Total	
	Mean	N	Mean	N	Mean	N	Mean	N
Commercial Banks (loan taken)	1,98,731	37	1,43,750	23	1,02,000	52	1,95,270	37
Commercial Banks (outstanding)	2,04,234	25	1,50,909	21	97,429	30	2,00,507	25
Regional Rural Bank (loan taken)	1,54,335	16	79,000	10	90,000	9	1,52,027	15
Regional Rural Bank (Outstanding)	1,51,450	11	79,000	10	1,00,000	4	1,48,781	11
Cooperative societies/banks (loan taken)	1,34,399	13	1,02,364	21	1,15,000	9	1,32,296	13
Cooperative societies/banks (outstanding)	1,32,965	8	1,17,800	19	1,17,500	9	1,31,516	9
SHGs (loan taken)	66,662	6	1,20,000	4	50,000	9	67,603	5
SHGs outstanding)	67,676	3	1,40,000	2		0	69,743	2
Money lender (loan taken)	2,57,409	16	1,76,250	15	2,88,000	22	2,55,279	16
Money lender (Outstanding)	2,78,644	12	2,13,333	12	3,81,667	13	2,78,163	12
Relatives/ Friends (loan taken)	2,35,854	6	1,30,000	10	1,00,000	4	2,28,295	6
Relatives/ Friends (outstanding)	2,61,809	3	1,33,333	6	1,00,000	4	2,51,078	4
Traders (loan taken)	2,86,897	2		0		0	2,86,897	2
Traders (outstanding)	3,81,429	1		0		0	3,81,429	0
Others (loan taken)	2,72,897	2		0		0	2,72,897	2
Others(outstanding)	1,99,909	1		0		0	1,99,909	1
<b>Total loan taken(formal)</b>	<b>1,90,315</b>	<b>63</b>	<b>1,39,440</b>	<b>48</b>	<b>1,23,857</b>	<b>61</b>	<b>1,87,821</b>	<b>62</b>
<b>Total outstanding(formal)</b>	<b>1,88,407</b>	<b>43</b>	<b>1,40,542</b>	<b>46</b>	<b>1,13,000</b>	<b>39</b>	<b>1,85,431</b>	<b>43</b>
<b>Total loan taken (informal)</b>	<b>2,69,018</b>	<b>25</b>	<b>1,71,667</b>	<b>23</b>	<b>3,08,000</b>	<b>22</b>	<b>2,66,306</b>	<b>25</b>
<b>Total outstanding (informal)</b>	<b>2,76,960</b>	<b>17</b>	<b>1,86,667</b>	<b>17</b>	<b>3,11,250</b>	<b>17</b>	<b>2,74,134</b>	<b>17</b>

**Table 9.2. Indebtedness (Rs.) by religion in bad year (2021-22)**

Religion	Hindu		Muslim		Christian		Total	
	Mean	N	Mean	N	Mean	N	Mean	N
Commercial Banks (loan taken)	2,05,058	23	1,11,571	13	80,000	26	2,00,682	23
Commercial Banks (outstanding)	2,09,856	31	1,16,333	23	1,02,000	30	2,05,491	30
Regional Rural Bank (loan taken)	1,65,224	11	86,333	12	80,000	4	1,61,597	11
Regional Rural Bank (Outstanding)	1,65,606	13	91,600	10	90,000	9	1,62,742	13
Cooperative societies/banks (loan taken)	1,66,180	8	31,400	10	2,00,000	4	1,60,709	8
Cooperative societies/banks (outstanding)	1,79,431	9	27,400	10	2,00,000	4	1,73,698	9
SHGs (loan taken)	76,130	4	66,667	6	50,000	13	74,350	4
SHGs (outstanding)	62,345	2	35,000	4	15,000	9	57,818	2
Money lender (loan taken)	3,20,149	23	2,00,833	23	1,80,000	22	3,13,745	23
Money lender (Outstanding)	3,21,570	25	2,17,143	27	3,16,667	26	3,17,450	25
Relatives/ Friends (loan taken)	2,12,768	4	2,50,000	6		0	2,14,661	4
Relatives/ Friends (outstanding)	2,39,177	5	3,16,667	6	1,00,000	4	2,40,591	5
Traders (loan taken)	1,29,565	2		0		0	1,29,565	2
Traders (outstanding)	2,50,556	1		0		0	2,50,556	1
Others (loan taken)	2,58,346	2		0		0	2,58,346	2
Others(outstanding)	2,70,128	3		0		0	2,70,128	3
Total loan taken(formal)	2,02,958	40	97,412	33	1,13,750	35	1,98,534	40
Total outstanding(formal)	2,13,032	49	1,03,050	38	1,40,500	35	2,08,950	48
Total loan taken (informal)	2,99,461	30	2,10,667	29	1,80,000	22	2,94,974	30
Total outstanding (informal)	3,12,167	33	2,34,706	33	3,33,333	26	3,09,641	33

**Table 9.3. Indebtedness (Rs.) by social group in normal year (2020-21)**

Caste	Sc		ST		OBC		General	
	Mean	N	Mean	N	Mean	N	Mean	N
Commercial Banks (loan taken)	1,09,070	33	1,45,658	26	2,04,864	35	2,10,240	42
Commercial Banks (outstanding)	94,375	18	1,53,250	21	2,21,531	25	2,06,460	28
Regional Rural Bank (loan taken)	1,12,750	15	1,25,238	14	1,54,815	14	1,63,598	17
Regional Rural Bank (Outstanding)	1,20,455	8	1,30,647	12	1,55,103	10	1,52,449	12
Cooperative societies/banks (loan taken)	55,000	6	78,684	13	1,47,084	15	1,37,684	13
Cooperative societies/banks (outstanding)	65,833	5	89,167	8	1,54,750	11	1,21,271	8
SHGs (loan taken)	93,167	9	53,333	8	66,719	6	62,727	4
SHGs (outstanding)	96,833	5	40,000	3	64,118	3	81,429	1
Money lender (loan taken)	2,17,321	21	2,18,958	16	2,41,042	17	2,94,118	15
Money lender (Outstanding)	2,40,000	15	2,46,053	13	2,52,056	13	3,31,492	10
Relatives/ Friends (loan taken)	1,13,000	8	2,56,364	8	2,31,111	6	2,52,258	5
Relatives/ Friends (outstanding)	1,16,667	2	2,77,000	7	2,68,696	4	2,33,667	3
Traders (loan taken)	1,16,667	2		0	2,77,059	3	3,62,222	2
Traders (outstanding)		0		0	5,60,000	1	1,43,333	1
Others (loan taken)	3,00,000	1	90,000	1	2,52,000	2	2,97,000	3
Others(outstanding)	3,00,000	1		0	1,05,500	1	2,46,167	1
Total loan taken(formal)	1,18,097	55	1,28,750	55	1,95,408	62	2,06,317	66
Total outstanding(formal)	1,03,773	34	1,34,808	41	2,00,196	45	1,96,667	44
Total loan taken (informal)	2,01,667	30	2,26,806	25	2,59,613	27	3,03,224	23
Total outstanding (informal)	2,27,083	18	2,56,724	20	2,64,608	18	3,05,155	14

The result of the study also shows that in the study area, among General caste, 17 per cent hem took loans from Regional Rural Bank, with an average amount of Rs. 1,63,598 as of March 2021, the average outstanding amount of the banks as of march 2021 is 1,52,449 for 12 per cent respondents. Money lenders were the highly used informal sources of loan, through which General Caste farmers were getting loans in 2021. 15 per cent of the respondents with Rs. 2,94,118 average amounts of loan were taken in year 2020-21 with outstanding average amount of Rs. 3,31,492. Further, commercial banks and money lenders were highly used for loans by respondents in 2020-21 and services which were used by General Caste farmers is as shown in the table no 7.3. In year 2021-22 the average amount of loan taken was 1,34,000 among 31 per cent of SC respondents and average outstanding amount is Rs 1,08,444 among 31 per cent SC respondents, money lenders are second source through which many farmers were getting loans in the year 2021-22 followed by regional rural banks there had been more than 50 percent raise in the no of farmers who have taken loans form regional rural banks compared to last year, whereas no one had taken loans from SHG for year 2021-22 this was unlike last year, shown in Table number 9.2.

It is also evident from the table that 35 per cent OBCs respondents took loans from commercial banks in year 2020-21 with average amount of Rs. 2,04,864 and with an average outstanding amount of loan of Rs. 2,06,460 taken as of march 2021. The commercial banks, regional rural banks and money lender are the major source of loan for OBCs respondents for

2021, highest amount of loan taken and high average outstanding amount among the OBCs respondents for year 2020-21 is from money lenders. For year 2021-22 there had been an increase in loan taken from various banking sources, the average amount of loan taken increased to Rs 1,42,608 from Rs. 1,11,818 and percentage of OBC respondents has increased from 31.8 to 33.3 in 2022. Loans taken from the money lenders also increased significantly as shown in the Table 9.3.

Among OBC respondents most of respondents used commercial banks as major source of loans followed by regional rural banks and money lenders for 2020-21. Highest number of beneficiaries among various banking services were OBC respondents due to high population's respondents had high percentage of loans from commercial banks, 26% for 2020-21 and high percentage of beneficiaries using services of formal banking sources, whereas from informal sources, loans taken from money lenders are high. Similar distribution of services is seen among OBC respondents for year 2021-22

From table 9.4 it is evident that the percentage of respondents from all castes was taking services of commercial banks, whereas highest average amount of loan taken by the respondents are from moneylenders. Highest average amount with standing was for moneylenders among all banking services for both the years.

**Table 9.4. Indebtedness by social group in bad year (2021-22)**

Caste	SC		ST		OBC		General	
	Mean	N	Mean	N	Mean	N	Mean	N
Commercial Banks (loan taken)	1,46,192	20	1,33,226	21	2,19,991	20	2,09,464	26
Commercial Banks (outstanding)	1,32,778	27	1,11,806	25	2,25,087	27	2,20,159	36
Regional Rural Bank (loan taken)	1,17,143	11	1,50,000	11	1,50,066	11	1,85,587	11
Regional Rural Bank (Outstanding)	1,32,632	15	1,40,000	14	1,50,881	12	1,87,333	13
Cooperative societies/banks (loan taken)	77,571	5	74,063	11	1,70,000	8	1,93,298	8
Cooperative societies/banks (outstanding)	81,667	5	86,154	9	1,94,345	10	1,83,173	9
SHGs (loan taken)	53,571	5	71,429	5	74,625	4	81,591	4
SHGs outstanding)	27,000	4	92,500	3	47,714	2	73,500	2
Money lender (loan taken)	2,25,000	26	2,11,750	27	3,77,592	26	2,93,313	19
Money lender (Outstanding)	2,46,622	28	1,98,068	30	3,85,742	29	2,89,839	20
Relatives/ Friends (loan taken)	1,05,000	5	2,32,222	6	2,69,000	4	1,69,474	3
Relatives/ Friends (outstanding)	1,05,000	5	2,47,083	8	2,65,143	5	2,43,000	3
Traders (loan taken)	75,000	3		0	1,65,833	2	98,571	1
Traders (outstanding)	66,667	2		0	1,83,333	1	3,56,667	2
Others (loan taken)		0	90,000	1	1,90,625	1	3,00,118	3
Others(outstanding)	3,00,000	2	90,000	1	2,61,071	2	2,81,364	4
Total loan taken(formal)	1,32,479	37	1,32,500	42	2,04,645	38	2,23,049	42
Total outstanding(formal)	1,36,638	44	1,30,077	45	2,13,023	47	2,36,834	51
Total loan taken (informal)	1,99,535	33	2,13,000	34	3,51,583	33	2,79,087	26
Total outstanding (informal)	2,29,457	35	2,06,491	39	3,69,729	36	2,93,703	28

From table 9.5 and 9.6, it is clear that the greater number of farmers, from all type of landholdings have taken loans from commercial banks, which is 50 percent for year 2020-21. Large land holding farmers have taken highest average amount of loan of Rs. 4,92,960 and highest percent of respondents claiming loans from commercial banks. 42 per cent were from medium group farmers, among all groups commercial banks were major sources of loans for the respondents, followed by regional rural banks and money lenders in informal sources etc., Money lenders were t mainly used as informal sources of income in the study area for 2020-21

**Table 9.5. Indebtedness (Rs) by own land size category in normal year (2020-21)**

Source of credit	Marginal		Small		Semi-Medium		Medium		Large	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Commercial Banks (loan taken)	1,14,091	28	1,17,241	31	1,41,906	37	2,23,749	42	4,92,960	50
Commercial Banks (outstanding)	1,19,595	19	1,26,711	22	1,44,761	25	2,26,675	29	5,34,677	31
Regional Rural Bank (loan taken)	77,368	10	78,486	15	1,20,190	17	2,06,449	17	3,45,333	15
Regional Rural Bank (Outstanding)	85,000	9	80,667	12	1,21,737	12	2,09,425	10	3,52,727	11
Cooperative societies/banks (loan taken)	71,773	11	1,05,152	13	1,20,885	13	1,42,255	13	2,90,667	15
Cooperative societies/banks (outstanding)	69,667	8	85,542	9	1,28,050	9	1,36,135	9	3,31,400	10
SHGs (loan taken)	80,571	7	70,667	6	56,400	5	66,579	5	82,000	5
SHGs outstanding)	67,625	4	1,00,000	2	65,500	2	63,182	3	75,000	2
Money lender (loan taken)	1,92,500	21	1,78,438	19	2,42,083	16	3,52,727	13	3,75,000	16
Money lender (Outstanding)	1,82,179	14	1,92,051	15	2,58,302	12	4,06,076	10	4,43,333	12
Relatives/ Friends (loan taken)	1,69,286	7	1,73,958	9	2,44,423	6	2,36,111	4	4,90,000	6
Relatives/ Friends (outstanding)	1,94,444	5	2,03,333	6	2,74,333	3	2,72,222	2	4,80,000	3
Traders (loan taken)	1,06,667	2	2,62,500	3	2,76,667	2	1,30,000	2	12,50,000	2
Traders (outstanding)	2,00,000	1	30,000	0	2,70,000	0	2,00,000	0	15,00,000	1
Others (loan taken)	1,10,000	1	1,16,000	2	1,26,667	2	4,53,077	3	2,00,000	1
Others(outstanding)	1,37,500	2	2,11,000	1	1,00,000	0	3,42,333	1		0
Total loan taken(formal)	1,07,340	49	1,18,411	55	1,42,768	65	2,24,799	67	4,73,945	72
Total outstanding(formal)	1,05,014	36	1,15,195	41	1,45,370	44	2,19,734	46	4,78,380	50
Total loan taken (informal)	1,92,768	28	1,88,938	32	2,42,611	25	3,62,500	21	4,65,600	25
Total outstanding (informal)	1,85,390	21	1,92,842	22	2,57,569	16	3,79,623	13	5,16,250	16

In year 2021-22 percentage of respondents using commercial bank services among all types of land holders reduced, the amount of loan taken increased for marginal, small, medium farmers and the total withstanding amount increased among all groups of farmers drastically for year 2021-22. When compared with year 2020-21. This was mainly due to huge crop loss that had occurred in last two years in the study area and there had been no income from the crops as a



result. Farmers were unable to pay the amount taken as loan from different sources due to which farmers had drown in debts which is clearly evident from the table 9.6. The details of various banking services available for small margin, semi medium, medium and large farmers are shown in table 9.5 and 9.6 in both years.

**Table 9.6. Indebtedness (Rs) by own land size category in bad year (2021-22)**

Source of credit	Marginal		Small		Semi-Medium		Medium		Large	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Commercial Banks (loan taken)	1,03,973	19	2,75,373	20	1,47,710	23	2,03,730	25	3,98,077	26
Commercial Banks (outstanding)	1,19,862	29	2,39,725	27	1,46,932	29	2,13,409	32	4,43,667	39
Regional Rural Bank (loan taken)	92,214	7	90,536	11	1,49,667	13	1,98,049	10	3,60,000	11
Regional Rural Bank (Outstanding)	96,067	8	90,441	13	1,44,056	16	2,08,021	12	3,49,286	14
Cooperative societies/banks (loan taken)	1,95,250	6	81,579	7	1,50,028	8	1,64,100	10	2,94,500	10
Cooperative societies/banks (outstanding)	1,68,357	7	91,762	8	1,68,119	9	1,52,659	10	4,36,636	11
SHGs (loan taken)	58,417	6	65,000	6	67,647	4	1,06,250	3	90,000	4
SHGs outstanding)	52,143	4	42,889	4	63,143	2	59,444	2	1,80,000	1
Money lender (loan taken)	2,95,556	27	1,73,922	20	2,92,358	23	3,36,870	25	6,80,455	22
Money lender (Outstanding)	3,02,232	28	1,64,455	22	2,93,947	25	3,52,518	27	6,17,037	27
Relatives/ Friends (loan taken)	1,09,286	4	2,06,154	5	2,35,000	4	2,26,000	4	2,66,667	6
Relatives/ Friends (outstanding)	1,25,692	7	2,35,714	5	2,76,053	4	2,33,333	4	4,40,000	5
Traders (loan taken)	66,667	2	1,05,000	2	1,71,429	2	1,38,750	2	50,000	1
Traders (outstanding)	66,667	2	2,87,500	2	3,37,500	1	1,52,000	1	5,25,000	2
Others (loan taken)		0	1,60,500	2	1,42,500	2	3,52,917	3	3,50,000	2
Others(outstanding)	1,21,667	3	2,14,000	2	1,95,000	3	4,13,929	3	3,00,000	2
<b>Total loan taken(formal)</b>	<b>1,29,873</b>	<b>32</b>	<b>1,99,000</b>	<b>38</b>	<b>1,61,526</b>	<b>42</b>	<b>2,14,982</b>	<b>41</b>	<b>3,91,444</b>	<b>45</b>
<b>Total outstanding(formal)</b>	<b>1,37,222</b>	<b>41</b>	<b>1,90,687</b>	<b>45</b>	<b>1,65,004</b>	<b>49</b>	<b>2,23,627</b>	<b>49</b>	<b>4,60,610</b>	<b>58</b>
<b>Total loan taken (informal)</b>	<b>2,72,984</b>	<b>31</b>	<b>1,75,167</b>	<b>28</b>	<b>2,76,176</b>	<b>30</b>	<b>3,26,323</b>	<b>32</b>	<b>5,77,333</b>	<b>30</b>
<b>Total outstanding (informal)</b>	<b>2,66,973</b>	<b>37</b>	<b>1,89,156</b>	<b>30</b>	<b>2,86,791</b>	<b>32</b>	<b>3,51,309</b>	<b>34</b>	<b>6,03,235</b>	<b>34</b>

### Indebtedness by cultivated land size category

The farmers, with cultivated land of less than 1 acre, banking services from formal sources was as followed: 28 percent of respondents among total 50 members respondents took loan from commercial banks, with an average amount of Rs 70,357 and 14 percent had taken loan from regional rural banks with an average amount of Rs.78,500, among 14 percent respondents, 16 percent respondents have taken an average amount of Rs 44,250 loan in cooperative societies. From informal banking sources respondents have taken loans mostly from relatives' friends, 14 percent average amount of Rs.1,74,285 followed by money lenders (Table 9.7 and 9.8)

The withstanding number of farmers with less than 1 acre cultivated land was 20 percent with average amount of Rs 78,500 in the commercial banks, 14 percent of respondents with average amount of Rs 81,428 in regional rural banks, among 8 percent respondents, withstanding amount in relatives and friends on an average amount of Rs 2,00,000 for 12 % respondents with average amount of Rs 1,68,333 for year 2020-21

Among farmers with land size 1-2 acres, banking services from formal sources was highly taken from commercial banks i.e., 33.3 percent respondents from 102 farmers belonging to cultivation land size of 1-2 acres have obtained loans from commercial banks with average amount of Rs. 93,264 in year 2020-21, from informal sources this group farmers had obtained average amount of Rs 1,62,368 with 18.6 % respondents highest in the informal banking for this group.

Whereas the percentage of respondents whose withstanding amount from loan taken as of march 2021 is high, with 27 percent of respondents with average amount of RS 94428 in commercial banks and average amount of Rs.1,62,368 among 15 % respondents with money lenders in informal sources as of 2020-21.

Farmers with land up to 2-4 acres 41% have taken loan from commercial banks, among 141 respondents from this group average amount of loan taken is Rs.1,16,120 and 17 % respondents have taken average loan of Rs 3,04,800 from money lenders for year 2020-21

Similarly, among farmers with cultivated land upto 4-10 acres and < 10 acres, the major source of banking from formal source was commercial banks and from informal sources is money lenders, Highest percentage of respondents using money lender services of 30 percent average amount of loan taken is Rs.4,00,000 with highest withstanding amount as of 2020-21.

From table 15.1 it is clear that all groups of farmers with different size of cultivated land, commercial banks services from formal sources were highly used and money lenders were preferred choice for getting loans from informal sources and other banking sources were also active during 2020-21 as given in table 15.1.

Table 9.8 shows that for year 2021-22 the respondents from all group's taking loan have decreased from commercial banks from 28 to 20 percent for the farmers with less than 1 acre of cultivated land. From 33 to 21.5 per cent for the farmers with 1-2 acres. For farmers with 2-4 acres decreased from 41 to 21 percent, for 4-10 acres respondents it has decreased to 26 percent from 40 percent and from 36 to 13 per cent among farmers with cultivated land of more than 10 acres.

In 2020-21, 37.3 percent of respondents have taken loans from commercial banks Out of all the farmers, only 22.0 per cent of them got loans in year 2021-22. Whereas in year 2020-21 18 % from total respondents have taken loans from money lenders which increased to 24.8 % in 2021-22, Increase in banking services from informal sources can be seen among total respondents from year 2020-21 to 2021-22.

**Table 9.7. Indebtedness (Rs.) by land cultivated size group in normal year (2020-21)**

Source of credit	Marginal		Small		Semi-Medium		Medium		Large	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Commercial Banks (loan taken)	1,07,083	30	1,04,125	25	1,25,128	35	1,93,763	42	3,58,990	44
Commercial Banks (outstanding)	92,813	20	1,12,938	21	1,31,621	23	1,93,908	28	3,92,939	28
Regional Rural Bank (loan taken)	72,222	11	72,414	15	1,15,395	19	1,85,284	13	2,46,316	16
Regional Rural Bank (Outstanding)	86,111	11	73,300	10	1,14,089	14	1,78,091	9	2,53,654	11
Cooperative societies/banks (loan taken)	69,929	18	93,962	13	84,477	11	1,42,217	14	2,31,970	14
Cooperative societies/banks (outstanding)	63,889	11	72,864	11	75,357	7	1,41,070	8	2,59,042	10
SHGs (loan taken)	94,000	9	71,667	3	56,731	6	54,615	5	99,231	6
SHGs outstanding)	67,750	5	1,00,000	2	61,250	3	55,000	2	1,06,000	2
Money lender (loan taken)	1,51,818	14	1,43,710	16	2,00,878	18	2,83,889	14	4,01,111	19
Money lender (Outstanding)	1,62,222	11	1,37,500	13	2,27,018	14	3,21,597	10	4,69,500	12
Relatives/ Friends (loan taken)	95,000	8	1,71,250	10	2,17,045	5	2,47,500	6	3,65,833	5
Relatives/ Friends (outstanding)	1,12,500	5	1,82,143	7	2,51,154	3	3,03,571	3	3,81,667	3
Traders (loan taken)	1,00,000	1	75,000	2	2,07,143	2	1,55,833	2	9,20,000	2
Traders (outstanding)		0	30,000	1	5,00,000	0	1,60,000	1	15,00,000	0
Others (loan taken)		0	77,000	1	1,42,500	1	2,58,889	4	5,06,000	2
Others(outstanding)	50,000	1	22,000	1	1,00,000	0	2,75,400	1	2,75,000	1
Total loan taken(formal)	1,07,044	56	1,00,717	51	1,22,027	64	1,98,557	64	3,54,335	67
Total outstanding(formal)	91,353	43	99,829	41	1,22,814	43	1,93,741	43	3,63,667	47
Total loan taken (informal)	1,37,647	21	1,48,821	29	2,02,430	26	2,89,744	23	4,73,710	27
Total outstanding (informal)	1,40,000	18	1,47,071	22	2,31,575	18	3,10,676	15	4,85,722	16

**Table 9.8. Indebtedness (Rs.) by cultivated land size category in bad year (2021-22)**

Source of credit	Marginal		Small		Semi-Medium		Medium		Large	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Commercial Banks (loan taken)	98,529	21	3,36,294	17	1,27,901	20	1,83,992	26	2,88,661	25
Commercial Banks (outstanding)	93,269	33	2,85,933	23	1,31,020	25	1,91,235	34	3,12,586	38
Regional Rural Bank (loan taken)	1,02,750	5	91,429	11	1,40,463	13	1,73,830	9	2,42,857	12
Regional Rural Bank (Outstanding)	1,02,200	6	90,800	13	1,36,141	16	1,83,396	10	2,40,143	15
Cooperative societies/banks (loan taken)	2,95,000	5	73,615	7	1,23,429	7	1,71,731	10	2,14,000	9
Cooperative societies/banks (outstanding)	2,16,167	8	72,938	8	1,24,200	7	1,78,377	10	2,81,792	10
SHGs (loan taken)	98,333	4	60,000	3	58,438	4	78,185	5	91,111	4
SHGs outstanding)	1,22,500	3	53,333	2	56,875	2	42,375	3	92,500	2
Money lender (loan taken)	1,89,286	18	1,35,000	16	2,10,298	21	2,80,969	26	5,91,370	31
Money lender (Outstanding)	2,03,750	15	1,29,706	17	2,24,202	23	2,85,964	27	5,62,471	37
Relatives/ Friends (loan taken)	1,31,250	5	1,74,545	6	1,52,308	3	2,52,000	4	2,90,909	5
Relatives/ Friends (outstanding)	82,333	8	2,10,769	7	2,19,667	4	2,35,000	4	3,87,500	5
Traders (loan taken)		0	73,333	2	1,20,000	2	1,59,091	2	50,000	0
Traders (outstanding)		0	50,000	2	1,50,000	1	1,43,333	1	6,87,500	2
Others (loan taken)		0	2,06,000	1	1,10,000	1	2,62,188	3	3,56,000	2
Others(outstanding)	50,000	1	2,80,000	1	1,52,000	1	2,34,773	4	4,28,000	4
Total loan taken(formal)	1,42,440	31	2,24,785	33	1,39,600	39	1,97,844	43	2,92,232	43
Total outstanding(formal)	1,31,706	43	2,05,800	41	1,42,707	45	2,09,448	49	3,21,301	57
Total loan taken (informal)	1,76,389	23	1,43,340	24	1,97,500	26	2,81,129	34	5,41,573	38
Total outstanding (informal)	1,57,316	24	1,48,627	26	2,19,322	29	2,80,348	35	5,66,571	45

The table 9.7 shows Loans taken from formal and informal sources based on Total cultivated land 2020-21. From the data it is visible that 44 per cent of large farmers took loan of Rs. 3,58,990 on an average from Commercial Banks in the year 2020-21. While 42 per cent of the medium farmers took loan of Rs. 1,93,763 on an average from Commercial Banks in the year 2020-21. Nearly 18 per cent of marginal farmers took loan of Rs. 69,929 from the cooperative societies/banks in 2020-21. On the other hand, only 14 per cent of the large farmers took loan amount of Rs. 2,31,970 from the cooperative societies.

Further it is also evident from the table that formal source of loan was most preferred by all the farmers irrespective of their cultivated land size. In 2021 total loan taken from formal source by large farmers was Rs. 3,54,335 (67%) followed by medium farmers with total loan amount of Rs. 1,98,557 (64%), semi medium farmers with average amount of Rs. 1,22,027 (64), marginal farmers with average amount of Rs. 1,07,044 (56%) and lastly small farmers with average loan amount of Rs. 1,00,717 (51%). Further from the table 7.8 it is evident that total **loans** taken from informal source in 2021-22 was highest among all the farmers irrespective of the size of the cultivated land compared to the previous year with total average amount of Rs. 3,09,641 among 33 per cent of all the farmers in all the three states. 45 per cent of large farmers took the total loan of amount of Rs 5,66,571 from informal source in the year 2021-22.

### Indebtedness among poor

All banking services were slightly less in the percentage of respondents, when compared to respondents that were not from BPL as shown in the table. 9.9

For years 2020-21 & 2021-22, which showed irrespective of poverty levels there had been distribution of banking services equally with slight variation of BPL farmers having less usage in the study area. Which was due to non-availability of own land or own properties through which they can get loans.

From table 9.9 and 9.10, it is clear that the greater number of farmers that fall under BPL have taken loans from commercial banks, which is 38 percent for year 2020-21 at an average amount of loan of Rs.20,081 and the farmers who fall under APL have taken loans from commercial banks, which is 36 per cent with an average amount of Rs.1,95,270. The major source of loan for

BPL respondents were commercial, followed by money lenders in informal sources etc., Money lenders were mainly used as informal sources of income in the study area for 2020-21

In year 2021-22 percentage of respondents who were BPL using commercial bank services increased slightly. However, the amount of loan taken decreased for the group of farmers who are APL for year 2021-22. When compared with year 2020-21.

The details of various banking services available for farmers who are BPL and APL are shown in table 9.9 and 9.10 in both years.

**Table 9.9. Indebtedness (Rs.) by poverty status in normal year (2020-21) for households who are poor in 2020-21**

BPL2021	Non-poor		Poor	
	Mean	N	Mean	N
Commercial Banks (loan taken)	2,00,815	38	1,83,556	36
Commercial Banks (outstanding)	2,03,613	25	1,94,346	25
Regional Rural Bank (loan taken)	1,48,825	16	1,59,615	14
Regional Rural Bank (Outstanding)	1,50,353	12	1,44,103	8
Cooperative societies/banks (loan taken)	1,32,115	12	1,32,575	15
Cooperative societies/banks (outstanding)	1,28,224	8	1,36,520	11
SHGs (loan taken)	62,759	6	81,650	4
SHGs (outstanding)	66,600	3	77,600	2
Money lender (loan taken)	2,64,487	16	2,36,623	16
Money lender (Outstanding)	2,90,082	12	2,57,016	13
Relatives/ Friends (loan taken)	2,17,404	5	2,44,028	8
Relatives/ Friends (outstanding)	2,51,094	3	2,51,053	4
Traders (loan taken)	3,18,182	2	1,88,571	1
Traders (outstanding)	5,25,000	0	1,90,000	1
Others (loan taken)	2,18,000	2	3,31,714	3
Others(outstanding)	2,75,000	1	1,09,800	1
Total loan taken(formal)	1,87,693	64	1,88,096	59
Total outstanding(formal)	1,83,637	44	1,89,345	41
Total loan taken (informal)	2,68,820	25	2,61,659	27
Total outstanding (informal)	2,91,294	16	2,45,213	19

Note: Household categorised as poor and non-poor based on income in year 2020-21

For years 2020-21 & 2021-22, which showed irrespective of poverty levels there had been distribution of banking services equally with slight variation of BPL farmers having less usage in the study area. Which was due to non-availability of own land or own properties through which they can get loans.

From table 9.9 and 9.10, it is clear that the greater number of farmers that fall under APL have taken loans from commercial banks, which is 39 percent for year 2020-21 at an average amount of loan of Rs1,83,058 and the farmers who fall under BPL have taken loans from commercial banks, which is 35 per cent with an average amount of Rs.2,07,116, The major source of loan for APL respondents were commercial, followed by money lenders in informal sources etc., Money lenders were mainly used as informal sources of income in the study area for 2020-21

**Table 9.10. Indebtedness (Rs.) and poverty status in bad year (2021-22) for households who are poor in 2020-21**

BPL 2021	Non-poor		Poor	
	Mean	N	Mean	N
Commercial Banks (loan taken)	2,13,363	24	1,71,827	23
Commercial Banks (outstanding)	2,24,208	31	1,63,235	31
Regional Rural Bank (loan taken)	1,64,774	12	1,52,231	11
Regional Rural Bank (Outstanding)	1,66,208	14	1,54,077	13
Cooperative societies/banks (loan taken)	1,61,721	9	1,57,903	8
Cooperative societies/banks (outstanding)	1,57,389	10	2,19,265	9
SHGs (loan taken)	75,750	5	68,750	4
SHGs outstanding)	63,320	3	40,625	2
Money lender (loan taken)	3,29,708	26	2,65,663	23
Money lender (Outstanding)	3,32,230	28	2,74,076	25
Relatives/ Friends (loan taken)	2,25,395	4	1,95,238	4
Relatives/ Friends (outstanding)	2,45,951	4	2,31,800	5
Traders (loan taken)	1,41,053	2	75,000	2
Traders (outstanding)	2,58,667	2	2,10,000	1
Others (loan taken)	2,37,667	2	2,86,545	2
Others(outstanding)	2,13,654	3	3,83,077	3
Total loan taken(formal)	2,05,056	43	1,81,503	40
Total outstanding(formal)	2,15,074	51	1,93,466	49
Total loan taken (informal)	3,09,672	33	2,55,190	30
Total outstanding (informal)	3,19,360	36	2,83,876	33

Note: Household categorised as poor and non-poor based on income in year 2020-21

In year 2021-22 percentage of respondents who were APL using commercial bank services increased slightly. However, the amount of loan taken also increased for the group of farmers who are BPL for year 2021-22. When compared with year 2020-22. The details of various banking services available for farmers who are BPL and APL are shown in table 9.11 and 9.12 in both years.

**Table 9.11. Indebtedness (Rs.) by poverty level in normal year (2020-21) for households who poor in 2021-22**

BPL2022	Non-poor		Poor	
	Mean	N	Mean	N
Commercial Banks (loan taken)	2,07,116	35	1,83,058	39
Commercial Banks (outstanding)	2,09,122	23	1,92,540	28
Regional Rural Bank (loan taken)	1,46,363	16	1,59,421	14
Regional Rural Bank (Outstanding)	1,48,851	12	1,48,691	10
Cooperative societies/banks (loan taken)	1,24,495	13	1,41,172	13
Cooperative societies/banks (outstanding)	1,21,058	9	1,44,175	9
SHGs (loan taken)	65,098	7	72,333	4
SHGs outstanding)	71,316	3	67,875	2
Money lender (loan taken)	2,51,653	16	2,59,196	17
Money lender (Outstanding)	2,60,767	12	2,97,256	12
Relatives/ Friends (loan taken)	2,38,143	5	2,21,792	8
Relatives/ Friends (outstanding)	2,78,913	3	2,28,214	4
Traders (loan taken)	3,83,750	2	1,67,692	2
Traders (outstanding)	5,60,000	1	1,43,333	0
Others (loan taken)	2,62,727	1	2,79,111	3
Others(outstanding)	2,37,500	1	1,78,429	1
<b>Total loan taken(formal)</b>	<b>1,88,359</b>	<b>63</b>	<b>1,87,200</b>	<b>62</b>
<b>Total outstanding(formal)</b>	<b>1,83,209</b>	<b>42</b>	<b>1,87,849</b>	<b>44</b>
<b>Total loan taken (informal)</b>	<b>2,70,540</b>	<b>23</b>	<b>2,62,235</b>	<b>28</b>
<b>Total outstanding (informal)</b>	<b>2,77,933</b>	<b>16</b>	<b>2,70,367</b>	<b>18</b>

Note: Household categorised as poor and non-poor based on income in year 20221-22

**Table 9.12. Indebtedness (Rs.) by poverty level in bad year (2021-22) for households who are poor in 2021-22.**

BPL2022	Non-poor		Poor	
	Mean	N	Mean	N
Commercial Banks (loan taken)	2,25,337	24	1,69,993	22
Commercial Banks (outstanding)	2,35,112	33	1,64,350	27
Regional Rural Bank (loan taken)	1,52,783	12	1,74,677	9
Regional Rural Bank (Outstanding)	1,54,769	14	1,73,372	12
Cooperative societies/banks (loan taken)	1,56,310	9	1,67,500	7
Cooperative societies/banks (outstanding)	1,41,797	10	2,24,100	8
SHGs (loan taken)	79,795	6	59,375	2
SHGs outstanding)	61,217	3	50,000	2
Money lender (loan taken)	3,10,813	26	3,17,786	21
Money lender (Outstanding)	3,04,305	28	3,36,242	22
Relatives/ Friends (loan taken)	2,34,783	3	2,01,806	5
Relatives/ Friends (outstanding)	2,48,281	4	2,33,353	5
Traders (loan taken)	1,18,333	2	1,41,818	2
Traders (outstanding)	3,06,154	2	1,06,000	1
Others (loan taken)	2,65,000	2	2,51,692	2
Others(outstanding)	2,20,833	2	3,12,381	3
<b>Total loan taken(formal)</b>	<b>2,10,321</b>	<b>43</b>	<b>1,82,475</b>	<b>36</b>
<b>Total outstanding(formal)</b>	<b>2,18,165</b>	<b>53</b>	<b>1,95,754</b>	<b>42</b>
<b>Total loan taken (informal)</b>	<b>2,96,422</b>	<b>31</b>	<b>2,93,197</b>	<b>29</b>
<b>Total outstanding (informal)</b>	<b>3,01,183</b>	<b>35</b>	<b>3,20,808</b>	<b>31</b>

Note: Household categorised as poor and non-poor based on income in year 2021-22

### **Indebtedness by tenancy status**

Pure tenants were farmers who did farming only on leased land without own land holding available, in the study area from table 9.13 & 9.14, it is clear that respondents who were not pure tenants when compared to the percentage of pure tenants using all banking services were low for both years, 2020-21 & 2021-22.



**Table 9.13. Indebtedness (Rs) by tenancy status in normal year (2020-21)**

Pure tenant wise-2022	Owner-farmer		Tenant-farmer	
	Mean	N	Mean	N
Commercial Banks (loan taken)	1,97,671	38	1,18,750	22
Commercial Banks (outstanding)	2,02,699	26	1,31,364	15
Regional Rural Bank (loan taken)	1,52,599	16	90,000	3
Regional Rural Bank (Outstanding)	1,49,549	11	90,000	3
Cooperative societies/banks (loan taken)	1,33,761	13	88,333	8
Cooperative societies/banks (outstanding)	1,32,854	9	76,667	4
SHGs (loan taken)	68,419	5	52,500	6
SHGs outstanding)	71,848	2	35,000	3
Money lender (loan taken)	2,61,033	16	1,94,000	28
Money lender (Outstanding)	2,88,597	12	1,25,455	15
Relatives/ Friends (loan taken)	2,28,795	6	2,20,000	7
Relatives/ Friends (outstanding)	2,48,021	4	3,00,000	4
Traders (loan taken)	2,96,429	2	20,000	1
Traders (outstanding)	3,81,429	1		0
Others (loan taken)	2,84,963	2	1,10,000	3
Others(outstanding)	1,99,909	1		0
<b>Total loan taken(formal)</b>	<b>1,90,451</b>	<b>64</b>	<b>1,04,444</b>	<b>38</b>
<b>Total outstanding(formal)</b>	<b>1,87,487</b>	<b>44</b>	<b>1,13,235</b>	<b>24</b>
<b>Total loan taken (informal)</b>	<b>2,70,611</b>	<b>25</b>	<b>2,08,800</b>	<b>35</b>
<b>Total outstanding (informal)</b>	<b>2,81,058</b>	<b>17</b>	<b>1,62,857</b>	<b>19</b>

Note: N= % of households

**Table 9.14. Indebtedness (Rs.) by tenancy status in bad year (2021-22)**

Tenant in 2022	Owner-farmer		Tenant-farmer	
	Mean	N	Mean	N
Commercial Banks (loan taken)	2,03,945	23	1,16,667	17
Commercial Banks (outstanding)	2,08,097	31	1,45,833	25
Regional Rural Bank (loan taken)	1,61,771	11	1,35,000	1
Regional Rural Bank (Outstanding)	1,63,578	13	87,500	3
Cooperative societies/banks (loan taken)	1,62,973	8	1,10,000	7
Cooperative societies/banks (outstanding)	1,75,696	9	1,11,250	6
SHGs (loan taken)	77,364	4	41,200	7
SHGs outstanding)	59,290	2	35,000	3
Money lender (loan taken)	3,07,859	23	3,77,857	39
Money lender (Outstanding)	3,10,922	25	3,92,414	40
Relatives/ Friends (loan taken)	2,18,684	4	1,00,000	3
Relatives/ Friends (outstanding)	2,46,435	5	1,50,000	6
Traders (loan taken)	1,39,000	1	66,667	4
Traders (outstanding)	2,87,333	1	66,667	4
Others (loan taken)	2,58,346	2		0
Others(outstanding)	2,79,865	3	90,000	3
<b>Total loan taken(formal)</b>	<b>2,01,605</b>	<b>41</b>	<b>1,14,550</b>	<b>28</b>
<b>Total outstanding(formal)</b>	<b>2,11,216</b>	<b>49</b>	<b>1,44,130</b>	<b>32</b>
<b>Total loan taken (informal)</b>	<b>2,90,373</b>	<b>30</b>	<b>3,54,194</b>	<b>43</b>
<b>Total outstanding (informal)</b>	<b>3,05,449</b>	<b>32</b>	<b>3,63,529</b>	<b>47</b>

Note: N=percent of households

For years 2020-21 & 2021-22, which shows the loans taken on the basis of irrigated land usage banking services for the farmers in the study area.

From table 9.15 and 9.16, it is clear that the greater number of farmers that fall under whose area does not fall under irrigated land have taken loans from commercial banks, which is 39 percent for year 2020-21 at an average amount of loan of Rs.1,95,815 and the farmers whose area falls under irrigated land have taken loans from commercial banks, which is 36 per cent with an average amount of Rs.1,94,905. The major source of loan for respondents with less irrigated land were commercial, followed by money lenders in informal sources etc., Money lenders were mainly used as informal sources of income in the study area for 2020-21

In year 2021-22 percentage of respondents whose area did not fall under irrigated land, using commercial bank services decreased drastically. Also, the amount of loan taken decreased for the group of farmers whose area falls under no irrigated land for year 2021-22. when compared with year 2020-22.

The details of various banking services available for farmers whose area fall under irrigated land and no irrigated land are shown in table 9.15 and 9.16 in both years.

**Table 9.15. Indebtedness (Rs.) by dry and irrigated farmers in normal year (2020-21)**

Irrigated farmer in 2022	Dry land		Irrigated land	
	Mean	N	Mean	N
Commercial Banks (loan taken)	1,95,815	39	1,94,905	36
Commercial Banks (outstanding)	2,05,268	28	1,97,034	24
Regional Rural Bank (loan taken)	1,37,744	15	1,60,577	16
Regional Rural Bank (Outstanding)	1,36,596	9	1,54,083	12
Cooperative societies/banks (loan taken)	1,20,645	14	1,40,345	13
Cooperative societies/banks (outstanding)	1,14,558	10	1,43,432	8
SHGs (loan taken)	61,857	6	72,279	5
SHGs outstanding)	67,273	2	70,875	3
Money lender (loan taken)	2,03,500	17	2,87,867	16
Money lender (Outstanding)	2,07,136	11	3,15,248	13
Relatives/ Friends (loan taken)	2,15,741	5	2,33,852	7
Relatives/ Friends (outstanding)	2,15,000	1	2,56,818	5
Traders (loan taken)	1,61,429	1	3,26,818	3
Traders (outstanding)	2,35,000	1	5,76,667	0
Others (loan taken)	2,14,800	3	3,35,143	2
Others(outstanding)	1,42,714	1	3,00,000	0
<b>Total loan taken(formal)</b>	<b>1,85,773</b>	<b>63</b>	<b>1,89,128</b>	<b>62</b>
<b>Total outstanding(formal)</b>	<b>1,91,793</b>	<b>42</b>	<b>1,81,620</b>	<b>44</b>
<b>Total loan taken (informal)</b>	<b>2,21,031</b>	<b>24</b>	<b>2,91,394</b>	<b>26</b>
<b>Total outstanding (informal)</b>	<b>2,06,118</b>	<b>14</b>	<b>3,05,847</b>	<b>19</b>

N=Percent of households

**Table 9.16. Indebtedness (Rs) for dry and irrigated farmers in bad year (2021-22)**

Irrigated farmer in 2022	Dry land		Irrigated land	
	Mean	N	Mean	N
Commercial Banks (loan taken)	1,77,370	23	2,15,943	22
Commercial Banks (outstanding)	1,89,591	31	2,15,988	30
Regional Rural Bank (loan taken)	1,67,582	10	1,58,273	11
Regional Rural Bank (Outstanding)	1,66,121	11	1,61,161	14
Cooperative societies/banks (loan taken)	1,37,185	10	1,80,873	7
Cooperative societies/banks (outstanding)	1,45,450	11	1,98,261	8
SHGs (loan taken)	60,026	7	1,00,952	2
SHGs (outstanding)	42,611	3	76,067	2
Money lender (loan taken)	3,03,636	24	3,20,383	23
Money lender (Outstanding)	2,91,014	25	3,33,737	26
Relatives/ Friends (loan taken)	2,51,053	3	1,97,375	5
Relatives/ Friends (outstanding)	2,32,143	3	2,42,865	6
Traders (loan taken)	74,444	2	1,65,000	2
Traders (outstanding)	1,21,250	1	3,54,000	1
Others (loan taken)	3,51,429	1	2,24,053	2
Others(outstanding)	2,31,875	3	2,96,739	3
<b>Total loan taken(formal)</b>	<b>1,82,784</b>	<b>42</b>	<b>2,09,050</b>	<b>39</b>
<b>Total outstanding(formal)</b>	<b>1,99,031</b>	<b>48</b>	<b>2,15,038</b>	<b>48</b>
<b>Total loan taken (informal)</b>	<b>3,01,761</b>	<b>29</b>	<b>2,90,993</b>	<b>31</b>
<b>Total outstanding (informal)</b>	<b>2,84,556</b>	<b>31</b>	<b>3,23,679</b>	<b>34</b>

**Indebtedness by state**

For years 2020-21 & 2021-22, shows the variation of distribution of banking services used by the farmers of 3 different states based on the geography, availability of land and the crops which can be grown during the seasons.

From table 9.15 and 9.16, we can see that farmers from Andhra Pradesh have the highest percentage of loan from commercial banks which is 53 per cent for year 2020-21 at an average amount of loan of Rs.1,87,261, followed by Telangana with 37 per cent with an average amount of loan of RS 118953 and then Karnataka which has 21 per cent with an average amount of Rs. 3,43,078. The major source of loan for all 3 states respondents were commercial, followed by money lenders in informal sources etc. Money lenders were mainly used as informal sources of income in the study area for 2020-21

In year 2021-22 percentage of respondents from Andhra Pradesh and Karnataka who using commercial bank services has decreased with the 36 and 10 per cent respectively. For Telangana the amount of loan take for commercial bank services has increased. However, the percentage farmers who have taken loan decreased 2021-22. When compared with year 2020-22. The details

of various banking services available for farmers who are BPL and APL are shown in table 9.15 and 9.16 in both years.

From table 9.17 and 9.18 it is revealed that farmers in Telangana are taking more loans from informal sources, while farmers in Karnataka are taking from formal sources in normal year, but in bad year, indebtedness from informal sources was increased in all states.

**Table 9.17. Indebtedness (Rs.) by state in normal year (2020-21)**

State Name	Telangana		Karnataka		AP	
	Mean	N	Mean	N	Mean	N
Commercial Banks (loan taken)	1,18,953	37	3,43,078	21	1,87,261	53
Commercial Banks (outstanding)	1,29,511	29	3,67,054	14	1,91,863	33
Regional Rural Bank (loan taken)	1,01,576	14	1,92,389	19	1,47,222	13
Regional Rural Bank (Outstanding)	98,300	13	1,98,917	13	1,49,371	7
Cooperative societies/banks (loan taken)	1,18,642	15	1,16,013	17	1,89,154	8
Cooperative societies/banks (outstanding)	1,18,104	10	1,07,688	10	1,91,100	6
SHGs (loan taken)	82,128	8	58,750	1	52,429	7
SHGs (outstanding)	71,286	6	46,250	1	86,667	1
Money lender (loan taken)	2,91,221	19	2,59,595	15	2,08,562	15
Money lender (Outstanding)	3,00,843	15	2,81,639	13	2,34,268	9
Relatives/ Friends (loan taken)	2,41,795	8	2,24,595	8	1,95,833	3
Relatives/ Friends (outstanding)	2,64,643	6	2,27,500	3	2,50,714	1
Traders (loan taken)	3,04,000	4	3,90,000	1	72,500	1
Traders (outstanding)	4,86,000	1	40,000	0	2,00,000	0
Others (loan taken)	3,66,000	1	1,75,000	0	2,60,636	5
Others(outstanding)		0	1,75,000	0	2,05,444	2
<b>Total loan taken(formal)</b>	<b>1,27,190</b>	<b>65</b>	<b>2,44,368</b>	<b>53</b>	<b>1,99,588</b>	<b>69</b>
<b>Total outstanding(formal)</b>	<b>1,27,751</b>	<b>52</b>	<b>2,42,044</b>	<b>35</b>	<b>2,06,498</b>	<b>42</b>
<b>Total loan taken (informal)</b>	<b>3,00,603</b>	<b>31</b>	<b>2,54,872</b>	<b>24</b>	<b>2,31,673</b>	<b>21</b>
<b>Total outstanding (informal)</b>	<b>2,99,991</b>	<b>22</b>	<b>2,68,481</b>	<b>16</b>	<b>2,35,246</b>	<b>12</b>

**Table 9.18. Indebtedness (Rs.) by state in bad year ( 2021-22)**

State Name	Telangana		Karnataka		AP	
	Mean	N	Mean	N	Mean	N
Commercial Banks (loan taken)	1,92,417	22	2,68,404	10	1,87,047	36
Commercial Banks (outstanding)	1,78,690	28	2,89,844	16	1,91,929	47
Regional Rural Bank (loan taken)	1,35,612	15	2,19,000	6	1,61,930	12
Regional Rural Bank (Outstanding)	1,30,132	15	2,10,100	10	1,60,391	13
Cooperative societies/banks (loan taken)	1,33,056	8	1,16,885	11	2,73,621	6
Cooperative societies/banks (outstanding)	1,74,643	9	1,15,943	11	2,62,559	7
SHGs (loan taken)	98,846	3	52,500	1	69,780	9
SHGs outstanding)	87,750	3	46,250	1	39,412	4
Money lender (loan taken)	2,92,009	23	3,72,586	24	2,72,661	23
Money lender (Outstanding)	3,13,409	25	3,52,132	27	2,83,475	25
Relatives/ Friends (loan taken)	2,47,174	5	2,22,857	4	1,53,333	3
Relatives/ Friends (outstanding)	2,89,962	6	2,06,957	5	2,10,588	4
Traders (loan taken)	1,95,000	2	92,000	1	71,250	2
Traders (outstanding)	3,66,000	1	4,12,000	1	77,500	2
Others (loan taken)	30,000	0	2,37,000	1	2,75,100	4
Others(outstanding)	4,42,000	1	2,17,000	1	2,49,655	6
<b>Total loan taken(formal)</b>	<b>1,74,900</b>	<b>43</b>	<b>1,96,754</b>	<b>27</b>	<b>2,19,456</b>	<b>49</b>
<b>Total outstanding(formal)</b>	<b>1,74,407</b>	<b>50</b>	<b>2,33,054</b>	<b>35</b>	<b>2,22,887</b>	<b>59</b>
<b>Total loan taken (informal)</b>	<b>2,82,029</b>	<b>30</b>	<b>3,39,349</b>	<b>30</b>	<b>2,62,703</b>	<b>30</b>
<b>Total outstanding (informal)</b>	<b>3,23,952</b>	<b>32</b>	<b>3,31,242</b>	<b>34</b>	<b>2,75,399</b>	<b>34</b>

Table 9.19 presents total loans taken (both formal and informal together) and outstanding amount in 2020-21 and 2021-22. Indebted farmers are stable 61%, in Karnataka indebted farmers increased from 44% to 59%, while in Andhra Pradesh increased from 47% to 69%. Average outstanding loan was Rs.3.29 lakh in Karnataka, followed by AP (Rs.3.26 lakh) and Telangana (Rs.3.12 lakh). Average outstanding loan size was higher among OBC and FC households, large landholding farmers and irrigated farmers.

Table 9.19. Total loans taken and outstanding amount in normal and bad years (mean in Rs.1000)

			2020-21		2021-22	
			Loan taken	Outstanding	Loan taken	Outstanding
State	Telangana	Mean	238	219	288	312
		N	74	61	56	61
	Karnataka	Mean	294	294	316	329
		N	65	44	50	59
	AP	Mean	249	247	309	326
		N	75	47	61	69
Religion	Hindu	Mean	261	252	309	326
		N	72	51	56	64
	Muslim	Mean	198	211	201	209
		N	54	46	46	56
	Cristian	Mean	218	206	181	312
		N	65	48	43	43
Social group	SC	Mean	181	179	210	234
		N	69	43	54	60
	ST	Mean	188	207	210	206
		N	67	51	62	67
	OBC	Mean	274	265	343	362
		N	69	52	57	64
	OC	Mean	278	260	313	334
		N	74	50	53	61
Owned land	Marginal	Mean	172	169	239	245
		N	61	45	53	63
	Small	Mean	183	174	234	235
		N	69	52	53	61
	Medium	Mean	209	204	269	280
		N	73	51	56	62
	Semi-medium	Mean	308	295	341	359
		N	73	51	57	64
	Large	Mean	593	596	582	691
		N	77	53	59	68
Cultivated land	Marginal	Mean	143	127	192	174
		N	63	50	44	54
	Small	Mean	143	142	222	213
		N	66	51	49	58
	Medium	Mean	176	182	204	220
		N	74	52	52	58
	Semi-medium	Mean	274	263	300	307
		N	71	49	60	66
	Large	Mean	495	473	547	608
		N	73	52	61	72
Poverty status	Non-Poor	Mean	252	245	310	319
		N	72	50	59	70
	Poor	Mean	267	256	297	328
		N	70	52	51	55
Tenancy status	Owner	Mean	262	253	305	322
		N	72	51	55	63
	Tenant	Mean	187	168	289	320
		N	60	35	64	68
Irrigation status	Rainfed	Mean	234	227	293	297
		N	72	48	56	62
	Irrigated	Mean	275	263	311	338
		N	70	52	55	64
	Total	Mean	259	250	304	322
		N	71	51	55	63

N=percent of households

## Chapter-10

### Frequency of crop loss and insurance claims

The table 10.1 reveals Crop loss in 2 years based on Religion. It is evident from the table that percentage of farmers made loss in production cycle from last two years by Religion was highest among Christian with 1.7 per cent followed by Muslim with 1.7 per cent and 1.4 per cent was lost by Hindu. In the study it is also evident that a greater number of beneficiaries from the Insurance Company were Christian with 0.5 % followed by Hindu and Muslim. The study found that Hindu and Christian did not face any delay in getting the claim amount. However, 0.1 per cent Muslim farmers faced delay in getting the claim amount.

**Table:10.1. Crop loss in last 2 years by religion category of farmers**

Frequency of crop loss in last two years	Hindu	Muslim	Christian	Total
0	9.2	15.4	4.3	9.4
1	36.7	23.1	21.7	36
2	54.1	61.5	73.9	54.6
a. How many times you made a loss on a production cycle in last 2 years?	1.4	1.5	1.7	1.5
b. Did you get benefit from the Insurance Company for your loss?	0.3	0.2	0.5	0.3

Table no Table 10.1 illustrates, losses made by the farmers based on their religion, you can see that highest percentage of losses were made by Muslims 2 years of production cycle which is 15.4 percent, 23.1 per cent and 61.4 per cent followed by Hindus with the loses of 9.2 percent, 35.7 per cent and 51 per cent and Christians with the loses of 4.3 percent, 21.7 per cent and 73.9 per cent. Highest loss is made in the final production cycle by All 3 religions, which is 54.1 per cent for the Hindus, 61.5 per cent for the Muslims and 73.9 percent for the Christians, which is also the highest loss in all production cycles If you see the highest loss made were made in the last production cycle by all 3 religion which is shown in the table 10.1.

The number of beneficiaries of schemes based on Caste was shown in the table 10.2. Number of times loss made on a production cycle in last 2 years was shown among general caste and SC caste with 1.5 percentage times of loss each followed by OBC (1.4%) and ST (1.2%). Further highest number of beneficiaries from the Insurance Company was general caste farmers with 0.4% times of benefit availed from the insurance company. This was because 0.4 per cent farmers applied for claims.

**Table: 10.2. Crop loss in last 2 years by social group:**

Frequency of crop loss in last two years	SC	ST	OBC	General
0	7.6	13.7	9.1	9
1	32.8	47.9	39.5	30.3
2	59.5	38.4	51.4	60.8
a. How many times you made a loss on a production cycle in last 2 years?	1.5	1.2	1.4	1.5
b. Did you get benefit from the Insurance Company for your loss?	0.2	0.1	0.1	0.4

Table no Table 8.21 illustrates, Losses made by the farmers based on Caste, you can see that highest percentage of losses were made by ST in years of production cycle which is 13.7 percent,



47.9 per cent and 38.4 per cent followed by OBC with the losses of 9.1 percent, 39.5 per cent and 51.4 per cent, then SC with the losses of 7.6 percent, 32.8 per cent and 59.5 per cent. Lowest overall losses were for General caste which was lower compared to other caste. Highest loss is made in the final production cycle by All castes, which is 59.5 per cent for the SC, 38.4 per cent for the ST, 51.4 per cent for the and 60.8 for General caste, which is also the highest loss in all production cycles.

Crop loss in 2 years based on own land in 2022 is exhibited in the table 6.3. It is seen that differences in percentage of loss were made on a production cycle in last 2 years and faced delay in getting the claim amount in 2022 was negligible (Table 10.3).

**Table: 10.3. Crop loss in last 2 years by own land size category**

Frequency of crop loss in last two years	Marginal	Small	Semi-Medium	Medium	Large
0	5.5	11	10.1	8.8	11.9
1	42.7	34.1	37.6	33.8	28.7
2	51.8	54.9	52.3	57.4	59.4
a. How many times you made a loss on a production cycle in last 2 years?	1.5	1.4	1.4	1.5	1.5
b. Did you get benefit from the Insurance Company for your loss?	0.2	0.2	0.2	0.3	0.3

Table no Table 8.3 **illustrates**, losses made by the farmers based on own land, you can see that highest percentage of losses were made by farmers who owned large land in years of production cycle which is 11.9 percent, 28.7 per cent and 59.4 per cent followed by farmers who owned small land with the losses of 11 percent, 34.1 per cent and 54.9 per cent, then farmers who owned semi medium land with the losses of 10.1 percent, 37.6 per cent and 52.3 per cent. Lowest overall losses were for farmers who owned medium land which was lower compared to other land owners. Highest loss is made in the final production cycle by All castes, which is 51.8 per cent for the marginal land owners, 54.9 per cent for the small land owner, 52.3 per cent for the small-medium, 57.4 per cent for the medium and 59.4 per cent for the large land owners, which is also the highest loss in all production cycles.

**Table: 10.4. Crop loss in last 2 years by land cultivated size category**

Frequency of crop loss in last two years	Marginal	Small	Semi-Medium	Medium	Large	Total
0	10	12.8	10.8	7.3	8.2	9.4
1	47.5	37.9	39.8	34.4	27.2	36
2	42.5	49.2	49.4	58.3	64.7	54.6
a. How many times you made a loss on a production cycle in last 2 years?	1.3	1.4	1.4	1.5	1.6	1.5
b. Did you get benefit from the Insurance Company for your loss?	0.2	0.1	0.2	0.3	0.3	0.3

Table 10.4 illustrates, losses made by the farmers based on cultivated land, you can see that highest percentage of losses were made by farmers who owned semi-medium land in years of production cycle which is 10.8 percent, 37.9 per cent and 49.4 per cent followed by farmers who owned small land with the losses of 12.8 per cent, 37.9 per cent and 49.2 per cent, then farmers who owned marginal land with the losses of 10.0 percent, 47.5 per cent and 42.5 per cent. Lowest overall losses were for farmers who owned medium land which was lower compared to other land owners. Highest loss is made in the final production cycle by All castes, which is 42.5 per cent for the marginal land owners, 49.2 per cent for the small land owner, 49.4 per cent for the small-medium, 58.3 per cent for the medium and 64.7 per cent for the large land owners, which is also the highest loss in all production cycles

#### Crop loss in 2 years based on **based on BPL**

No of times farmers have made loss in last two years by poverty status of households given in Table 10.5. From the table it is clear that total of 1.5 per cent times loss was on a production cycle in last 2 years in 2021 same was followed in 2022 as well. 1.6 percent of loss was faced by BPL farmers in 2021 and 1.5 percent of loss was faced by BPL farmers in 2022. There is no difference in the benefit received from the insurance company between the year 2021 and 2022 among BPL farmers.

**Table: 10.5.** Crop loss in last 2 years by poverty status

Frequency of crop loss in last two years	BPL2021			BPL2022		
	0	1	Total	0	1	Total
0	10.4	7.2	9.4	12.2	6.2	9.4
1	41	25.8	36	36.2	35.8	36
2	48.5	66.9	54.6	51.7	58	54.6
a. How many times you made a loss on a production cycle in last 2 years?	1.4	1.6	1.5	1.4	1.5	1.5
b. Did you get benefit from the Insurance Company for your loss?	0.2	0.3	0.3	0.2	0.3	0.3

Table 10.5 illustrates, losses made by the farmers based on BPL, the losses for two years, i.e., 2021 and 2022, For both years framers who fall under have made more losses that Farmers who are not in BPL, the losses for farmers who are under BPL were, 10.4 per, 41.0 per cent and 48.5 per cent for year 2021 and 12.2 per cent, 36.2 per cent and 54.7 per cent for the year 2022. You can see an overall increase in losses in 2022 when compared to 2021. The losses made for the farmers who are not under BPL are 7.2 per cent, 25.8 per cent and 66.9 per cent in 2021, when compared to losses in 2022 the losses are 6.2 per cent, 35.8 per cent and 58.0 per cent. Which is slightly lower when compared between 2 years, for the losses in the production cycles.

Among pure tenants 1.5 per cent loss was made loss on a production cycle in last 2 years in 2022 (Table 10.6). However, 0.2 per cent farmers received benefit from the Insurance Company for the loss made in that particular year. Further only 0.2 per cent of the farmers applied for the claim and they faced no difficulty in availing the insurance.

**Table: 10.6. Crop loss in last 2 years by Tenancy status**

Frequency of crop loss in last two years	0	1	Total	
	0	9.6	5.6	9.4
	1	35.8	40.3	36
	2	54.7	54.2	54.6
a. How many times you made a loss on a production cycle in last 2 years?	1.5	1.5	1.5	
b. Did you get benefit from the Insurance Company for your loss?	0.3	0.2	0.3	

Table 8.6 illustrates, losses made by the farmers who were pure tenant. The losses for two years, is lower when compared to the farmers who used leased land. For both years the loses for the framers who were pure tenants were, 5.6 per cent, 40.3 per cent and 54.2 per cent compared to non-pure tenants, 9.6 per cent, 35.8 per cent and 54.7 per cent. Both Pure tenants and non-pure tenants have highest losses for in the final production cycle,

Crop loss in 2 years based on irrigated land is shown in the table 10.7. It is seen that farmers with Irrigated land faced 1.4 per cent times a loss on a production cycle in last 2 years as of 2022. However, 0.1 per cent times farmers claimed that they received benefit from the Insurance Company for their loss and 0.2 per cent times farmers applied for the claim in the year 2022.

**Table: 10.7 Crop loss in last 2 years for dryland and irrigated farmers:**

Frequency of crop loss in last two years	Dry land	Irrigated land	Total	
	0	6.6	11.1	9.4
	1	25.6	42.5	36
	2	67.8	46.5	54.6
a. How many times you made a loss on a production cycle in last 2 years?	1.6	1.4	1.5	
b. Did you get benefit from the Insurance Company for your loss?	0.4	0.1	0.3	

Table 10.7 illustrates, losses made by the farmers who have irrigated land, The losses for two years, is lower when compared to the farmers who do not have Irrigated land. For both years the loses for the framers who do not have Irrigated land were 6.6 per cent, 25.6 per cent and 67.8 per cent compared to farmers who have irrigated land, were 11.1 per cent, 42.5 per cent and 46.5 per cent. Both Pure tenants and non-pure tenants have highest losses in the final production cycle,

Crop loss in 2 years based on States is shown in the table 10.8. From the table it is visible that Andhra Pradesh farmers made highest loss (1.7%) in production cycle in last 2 years. This was followed by Karnataka and Telangana who scored same value (1.3%). No farmers in Karnataka and Telangana received benefit from the Insurance Company for their loss. Nevertheless 0.7% farmers received benefit from the Insurance Company for their loss and 0.7 per cent farmers applied for the claim. Only in Karnataka farmers faced delay (0.1%). in getting the claim amount.

**Table: 10.8 Crop loss in last 2 years by states**

Frequency of crop loss in last two years	Telangana	Karnataka	Andhra Pradesh	Total
0	11.5	15.4	1.3	9.4
1	44.1	39.8	24.4	36
2	44.3	44.8	74.4	54.6
a. How many times you made a loss on a production cycle in last 2 years?	1.3	1.3	1.7	1.5
b. Did you get benefit from the Insurance Company for your loss?	0	0	0.7	0.3

Table 10.8 demonstrates, losses made by 3 states, Telangana, Karnataka and Andhra Pradesh. The losses for two years, i.e. 2021 and 2022, highest losses for the production cycles in both the years, were from Karnataka at 15.4 per, 39.8 per cent and 44.8 per cent, followed by Telangana at 11.5 per cent, 44.1 per cent and 44.3 per cent. Andhra Pradesh, had the lowest over all losses compared to other states, where were 1.3 per cent, 24.4 per cent and 74.4 per cent. All 3 states have highest losses in the final production cycle,

## **Chapter-11**

### **Constraints to adoption of climate resilient agricultural technology**

India is one of the most vulnerable countries to climate change impacts, particularly in the agricultural sector. However, there are various climate-resilient agricultural technologies that can be implemented to reduce the negative impacts of climate change on Indian agriculture. Some of the climate-resilient agricultural technologies in India are:

**Drought-tolerant crops:** These are crops that can survive in dry conditions and require less water. Examples of drought-tolerant crops in India include millets, pulses, and oilseeds.

**Conservation agriculture:** This involves practices such as minimum tillage, mulching, and crop rotation, which help to conserve soil moisture and improve soil health.

**Agroforestry:** This involves the integration of trees into farming systems, which can provide additional income streams and help to reduce the impacts of climate change.

**Improved irrigation systems:** Efficient irrigation systems, such as drip irrigation and sprinkler systems, can help to conserve water and reduce the impacts of drought.

**Weather-based crop insurance:** This is a crop insurance scheme that uses weather data to estimate crop losses due to climate variability and provides financial support to farmers in case of crop failure.

**Climate-resilient livestock management:** This involves practices such as improved feeding and breeding practices, disease control, and better animal shelter, which can help to reduce the impacts of climate change on livestock.

Overall, the adoption of climate-resilient agricultural technologies in India can help to enhance the resilience of Indian agriculture to climate change impacts and improve the livelihoods of farmers.

Small farmers face various challenges in the adoption of new technology. Some of these challenges include:

**Access to information:** Small farmers may not have access to information on new technologies, including the benefits and how to implement them. Lack of access to information limits their ability to make informed decisions about whether to adopt the new technology or not.

**Cost:** Many new technologies require significant investments, which may be difficult for small farmers to afford. This includes the cost of purchasing the equipment, the cost of training, and the ongoing maintenance costs.

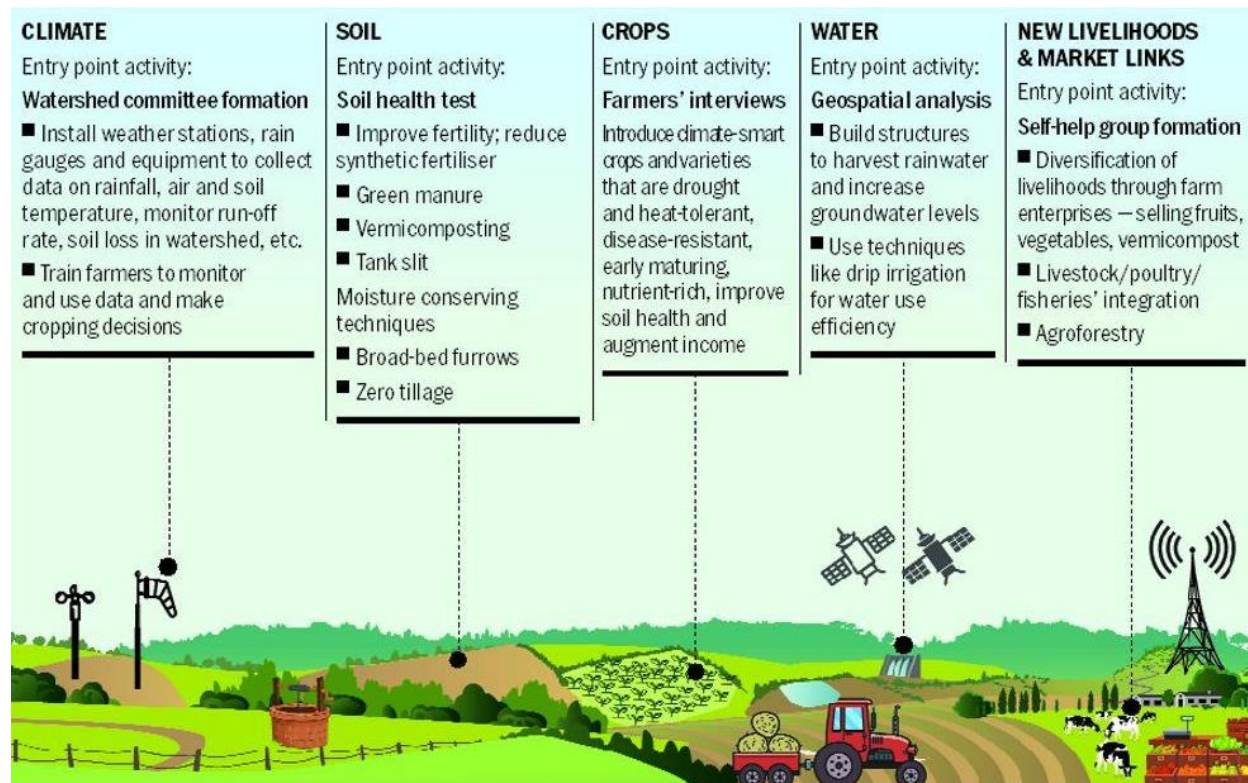
**Infrastructure:** Small farmers may not have the necessary infrastructure, such as reliable electricity or internet connectivity, to support the adoption of new technologies.

**Risk:** Small farmers may be risk-averse and hesitant to invest in new technologies due to the uncertainty of the outcomes. They may be concerned about the potential for crop failures, decreased yields, or other negative impacts on their livelihood.

**Knowledge and skills:** Adoption of new technologies requires specific knowledge and skills. Small farmers may lack the necessary knowledge and skills to adopt and implement new technologies.

Cultural and social factors: Cultural and social factors, such as gender roles and social norms, can also affect the adoption of new technologies. For example, women may have limited access to education and training, which can limit their ability to adopt new technologies.

Addressing these challenges requires targeted interventions that address the specific needs of small farmers. This can include initiatives that improve access to information, provide financing options for investment in new technologies, and provide training and education programs to build the necessary knowledge and skills. It can also include efforts to improve infrastructure and address cultural and social barriers to adoption.



Adaptation strategies used by sample farmers to overcome the crop loss are explained in the below mentioned **Table 11.1**. The table shows in 2020-21, farmers expressed that costly inputs (55.7 per cent), lack of capital (44.5%), Lack of liquid cash (43%) severely affected the farmers to take agricultural activities. Also, other factors were Indebtedness (43.8%), Tenancy (leased-in land) (26.6%), Lack of helping hands on farm(26.1%) and More labour intensive(25.1%) severely affected to adoption of climate smart technologies. Few farmers expressed that the factors with no effect or neutral effect to perform agricultural activities are Force from private seed companies to purchase their needs (38%), Low education level (24%), Spurious seeds/fertilizer(21.3%) and non-availability of farm machinery(20.6%).

Factors such as force from private companies to purchase their needs and tenancy were lease affected to farmers to take agricultural activities. Whereas in 2021-22 the increase in percentage of farmers whose agricultural activities were most severely affected by factors such as Costly inputs(56.4%), Indebtedness(46.3%),Lack of capital(40.6%), Lack of liquid cash(38.5%) and Tenancy (leased-in land) (31.1%). More than 30 per cent of farmers expressed that lack of access to information (32.1%), Low productive soils (31.8%) and Low education level(28%) played

neutral role in affecting agricultural activities. The study explained that in both years most of the farmers mentioned that the factors such as costly inputs, lack of liquid cash, indebtedness, non-availability of farm machinery non availability of inputs and lack of capital are most severely affected to perform agricultural activities.

**Table 11.1. Challenges in the adoption measures 2020-2021 and 2021-2022 (% of farmers rated indicators) (1=severe limitation; 5=not severe)**

Indicator	2020-21						2021-22					
	1	2	3	4	5	Total	1	2	3	4	5	Total
Costly inputs	56	24	12	4	4	100	56	24	12	5	3	100
Indebtedness	44	25	16	8	8	100	46	23	14	8	8	100
Lack of capital	45	24	18	8	6	100	41	25	21	8	6	100
Lack of liquid cash	43	27	20	7	4	100	39	27	22	8	4	100
Tenancy (leased-in land)	27	28	17	8	20	100	31	25	17	7	20	100
More labour intensive	25	32	24	10	10	100	30	29	21	10	11	100
Lack of helping hands on farm	26	21	26	14	14	100	27	20	25	14	14	100
Lack of extension services by govt	24	13	27	18	18	100	25	13	28	16	18	100
Non-availability of farm machinery	18	28	21	13	21	100	24	24	18	13	20	100
Lack of irrigation	22	22	21	16	19	100	24	21	21	16	19	100
Non-availability of inputs	21	28	20	13	18	100	22	26	22	13	18	100
Market far away	17	23	29	14	16	100	18	24	28	15	16	100
Low education	12	15	27	22	24	100	12	16	28	21	24	100
Spurious seeds and fertilizer	11	19	29	19	21	100	12	21	27	20	21	100
Lack of access to information-	11	20	31	23	15	100	12	20	32	21	15	100
Low productive soils	7	17	33	23	20	100	8	16	32	24	20	100
Force from private seed companies to purchase their needs	4	11	25	23	38	100	4	12	25	21	38	100

1= severe limitation; 5=not severe

## Chapter-12 Psychological Issues

Psychological issues faced by the farmers based on their religion explained in the below mentioned Table 12.1. In 2020, Christian farmers faced the highest Pressure for loan repayment which was 82.6 per cent which was same as 82.6, Muslim farmer faced highest Pressure for loan repayment which was 57.7 per cent which did not decrease in 2021, Hindu farmer also faced highest Pressure for loan repayment which was 73.9 per cent, which increased to 76.1 per cent in 2021. This was the high psychological issue faced back framers of all 3 religions in both years. Adding to that the next Psychological issues faced by the farmers is, that they are terribly worried about their financial situation, which is 66.6 per cent for Hindus, 65.2 per cent for Christians and 61.5 per cent Muslims, this has increased for Hindus and Muslims, 69.9 per cent and 63.5 per cent respectively in 2021.

Another Psychological issue faced by the farmers are, thinking that they are being in a constant pressure for a long time, which is 82.6 per cent for Christians, 61.5 per cent for Muslims and 52.8 per cent Hindus, this has increased for Hindus to 54.1 per cent in 2021.

**Table. 12.1. Psychological issues faced by religion of farmers (%)**

Religion	Hindu	Muslim	Christian	Total
Do you feel yourself isolated in the society or in your family? (2020)	12	15	39	12
Do you feel yourself isolated in the society or in your family? (2021)	12	15	39	13
Pressure for loan repayment (2020)	74	58	83	74
Pressure for loan repayment (2021)	76	58	83	76
Quarrel among your society (2020)	13	17	35	13
Quarrel among your society (2021)	13	17	35	14
Not able to fulfil your family's responsibilities (2020)	49	56	65	50
Not able to fulfil your family's responsibilities (2021)	52	54	65	53
Not getting support from your family/friends/relatives?(2020)	23	29	35	24
Not getting support from your family/friends/relatives?(2021)	26	29	35	26
Are you terribly worried about your financial situation? (2020)	67	62	65	66
Are you terribly worried about your financial situation?(2021)	70	64	65	70
Problem with the family members regarding the deterioration in economic status? (2020)	26	25	44	26
Problem with the family members regarding the deterioration in economic status? (2021)	29	31	44	29
Alcohol/drug abuse/ betting/gambling/insomnia(2020)	11	8	4	11
Alcohol/drug abuse/ betting/gambling/insomnia (2021)	12	4	4	11
unable to concentrate on your work and take decisions (2020)	30	33	61	30
unable to concentrate on your work and take decisions (2021)	30	33	61	31
Do you think that you are being in a constant pressure for a long time? (2020)	53	62	83	54
Do you think that you are being in a constant pressure for a long time? (2021)	54	62	83	55



Psychological issues faced by the farmers explained based on their Caste in the below mentioned Table 12.2. In 2020, SC farmers faced the highest Pressure for loan repayment which was 81.7 per cent, followed by the General caste farmers at 74.7, then ST caste farmer at 72.6 per cent and finally OBC caste at 70.5 per cent, in 2021 there was slight increase of Pressure for loan repayment for ST(73.3 per cent), OBC(74.6 per cent) and General(75.6 per cent)

ST caste farmer also faced was they were terribly worried about their financial situation, which was 69.2 per cent, which increased to 74.7 per cent in 2021. This was also one of the highest psychological issues faced back framers of all caste in 2021 and it increased in 2021.

Adding to that the next Psychological issues faced by the farmers is, thinking that they are being in a constant pressure for a long time, which is 65.6 per cent for General caste, 64.1 per cent for SC caste, 48.6 per cent ST caste and OBC at 40.0 per cent, there was a slight increase in 2021 for all the caste.

**Table. 12.2. Psychological issues faced by social group(%)**

Caste	SC	ST	OBC	General	Total
Do you feel yourself isolated in the society or in your family? (2020)	12	6	8	18	12
Do you feel yourself isolated in the society or in your family? (2021)	12	7	9	18	13
Pressure for loan repayment (2020)	82	73	71	75	74
Pressure for loan repayment (2021)	82	73	75	76	76
Quarrel among your society (2020)	11	8	10	18	13
Quarrel among your society (2021)	13	10	11	18	14
Not able to fulfil your family's responsibilities (2020)	53	52	50	47	50
Not able to fulfil your family's responsibilities (2021)	56	57	54	49	53
Not getting support from your family/friends/relatives?(2020)	21	25	24	24	24
Not getting support from your family/friends/relatives?(2021)	21	29	27	26	26
Are you terribly worried about your financial situation? (2020)	69	69	63	69	66
Are you terribly worried about your financial situation?(2021)	70	75	67	71	70
Problem with the family members regarding the deterioration in economic status? (2020)	26	20	25	29	26
Problem with the family members regarding the deterioration in economic status? (2021)	28	22	30	30	29
Alcohol/drug abuse/ betting/gambling/insomnia(2020)	8	19	12	8	11
Alcohol/drug abuse/ betting/gambling/insomnia (2021)	9	21	13	8	11
unable to concentrate on your work and take decisions (2020)	34	27	25	36	30
unable to concentrate on your work and take decisions (2021)	35	27	26	36	31
Do you think that you are being in a constant pressure for a long time? (2020)	64	49	40	66	54
Do you think that you are being in a constant pressure for a long time? (2021)	65	50	41	67	55

Psychological issues faced by the farmers explained based on the own land in the below mentioned Table 12.3. In 2020, Marginal owning farmers faced the highest Pressure for loan repayment which was 78.4 per

cent, followed by the medium land-owning farmers at 77.0 per cent, then large land-owning farmer at 75.1 per cent, after which small land-owning farmers at 71.0 per cent, finally semi-medium land-owning farmers at 69.1 per cent. In 2021 there was slight increase of Pressure for loan repayment for medium land owners (79.4 per cent), large land owners (77.2 per cent), small land owners (72.9 per cent) and semi-medium land owners (71.8 per cent)

In 2020 farmers farmer also faced, that they were terribly worried about their financial situation, which 68.6 per cent for small land owners, 67.1 per cent for marginal land owners, 66.3 per cent for large land owners, 65.9 per cent for medium land owners and finally 65.2 per cent for semi-medium land owners, this increased in 2021 by framers of all land owners in 2021 as shown in the table 12.3

Adding to that the next Psychological issues faced by the farmers is, thinking that they are being in a constant pressure for a long time, which is 56.6 per cent for medium land owners, 56.3 per cent for SC marginal land owners, 54.5 per cent for small land owners, 50.3 per cent for semi-medium land owners and large land owners at 48.5 per cent, there was a slight increase in 2021 for all land owners in 2021.

**Table: 12.3 Psychological issues faced by own land size category**

Total Own land wise-2022	Marginal	Small	Semi-Medium	Medium	Large
Do you feel yourself isolated in the society or in your family? (2020)	14	15	13	11	7
Do you feel yourself isolated in the society or in your family? (2021)	14	15	14	11	7
Pressure for loan repayment (2020)	78	71	69	77	75
Pressure for loan repayment (2021)	78	73	72	79	77
Quarrel among your society (2020)	15	17	15	10	7
Quarrel among your society (2021)	17	17	16	10	8
Not able to fulfil your family's responsibilities (2020)	51	53	48	50	41
Not able to fulfil your family's responsibilities (2021)	53	56	52	53	44
Not getting support from your family/friends/relatives?(2020)	25	28	25	22	13
Not getting support from your family/friends/relatives?(2021)	27	29	27	26	18
Are you terribly worried about your financial situation? (2020)	67	69	65	66	66
Are you terribly worried about your financial situation?(2021)	70	72	69	67	74
Problem with the family members regarding the deterioration in economic status? (2020)	28	28	28	25	22
Problem with the family members regarding the deterioration in economic status? (2021)	30	28	30	28	30
Alcohol/drug abuse/ betting/gambling/insomnia(2020)	6	12	12	10	13
Alcohol/drug abuse/ betting/gambling/insomnia (2021)	7	14	12	11	9
unable to concentrate on your work and take decisions (2020)	34	38	30	28	16
unable to concentrate on your work and take decisions (2021)	34	38	30	29	19
Do you think that you are being in a constant pressure for a long time? (2020)	56	55	50	57	49
Do you think that you are being in a constant pressure for a long time? (2021)	57	57	51	58	49

Psychological issues faced by the farmers explained based on the Cultivated land in the below mentioned in table 12.4. In 2020, Medium owning farmers faced the highest Pressure for loan repayment which was 77.3 per cent, followed by the large farmers at 77.2 per cent, then marginal farmer at 70.0 per cent, after which semi medium farmers at 69.8 per cent, finally small farmers at 68.2 per cent. In 2021 there was slight increase of Pressure for loan repayment for medium (79.8 per cent), large (78.9 per cent), semi-medium (72.0 per cent) and small (69.7 per cent)

In 2020 farmers farmer also faced, that they were terribly worried about their financial situation, which 69.0 per cent for large, 67.0 per cent for medium, 65.8 per cent for semi-medium, 65.6 per cent for small and finally 60.0 per cent for marginal farmers, this increased in 2021 for all framers in 2021 as shown in the table 12.4.

Adding to that the next Psychological issues faced by the farmers is, thinking that they are being in a constant pressure for a long time, which is 57.1 per cent for medium, 55.2 per cent for large, 53.3 per cent for small, 50.4 per cent for semi-medium and small at 43.5 per cent, there was a slight increase in 2021 for all farmers except for large farmers who saw decrease at 54.8 per cent.

**Table: 12.4. Psychological issues faced by cultivated land size category**

Total Cultivated land wise-2022	Marginal	Small	Semi-Medium	Medium	Large
Do you feel yourself isolated in the society or in your family? (2020)	10	12	13	13	12
Do you feel yourself isolated in the society or in your family? (2021)	10	12	14	14	11
Pressure for loan repayment (2020)	70	68	70	77	77
Pressure for loan repayment (2021)	70	70	72	80	79
Quarrel among your society (2020)	10	13	15	12	12
Quarrel among your society (2021)	10	14	16	13	13
Not able to fulfil your family's responsibilities (2020)	40	47	50	52	48
Not able to fulfil your family's responsibilities (2021)	41	51	54	55	50
Not getting support from your family/friends/relatives?(2020)	24	25	26	23	19
Not getting support from your family/friends/relatives?(2021)	24	26	28	25	25
Are you terribly worried about your financial situation? (2020)	60	66	66	67	69
Are you terribly worried about your financial situation?(2021)	60	70	69	69	75
Problem with the family members regarding the deterioration in economic status? (2020)	20	22	27	26	32
Problem with the family members regarding the deterioration in economic status? (2021)	21	23	28	30	35
Alcohol/drug abuse/ betting/gambling/insomnia(2020)	4	16	12	10	10
Alcohol/drug abuse/ betting/gambling/insomnia (2021)	4	18	13	10	8
unable to concentrate on your work and take decisions (2020)	35	36	31	30	23
unable to concentrate on your work and take decisions (2021)	36	35	32	31	25
Do you think that you are being in a constant pressure for a long time? (2020)	44	53	50	57	55
Do you think that you are being in a constant pressure for a long time? (2021)	45	55	51	59	55

Psychological issues faced by the farmers explained BPL wise mentioned in table 12.5. In 2020, farmers who are BPL faced the highest Pressure for loan repayment which was 76.5 per cent and farmers who are not BPL at 71.9 per cent. However, in 2021 there was an increase of Pressure for loan repayment for farmers who are BPL at 77.3 per cent and Farmers who are not BPL at 74.6 per cent

In 2020 farmers farmer also faced, that they were terribly worried about their financial situation, which 66.8 per cent for farmers who are not BPL and 65.7 per cent for farmers who are BPL. However, there was an increase in 2021 by framers who are not BPL at 70.8 per cent and 67.2 per cent for farmers who are BPL shown in the table 12.5.

Adding to that the next Psychological issues faced by the farmers is, thinking that they are being in a constant pressure for a long time, which is 48.8 per cent for farmers who are BPL and 48.8 per cent for farmers who are BPL, However, there was a in 2021 for farmers both BPL and farmers who are not BPL.

**Table: 12.5. Psychological issues faced by poverty status**

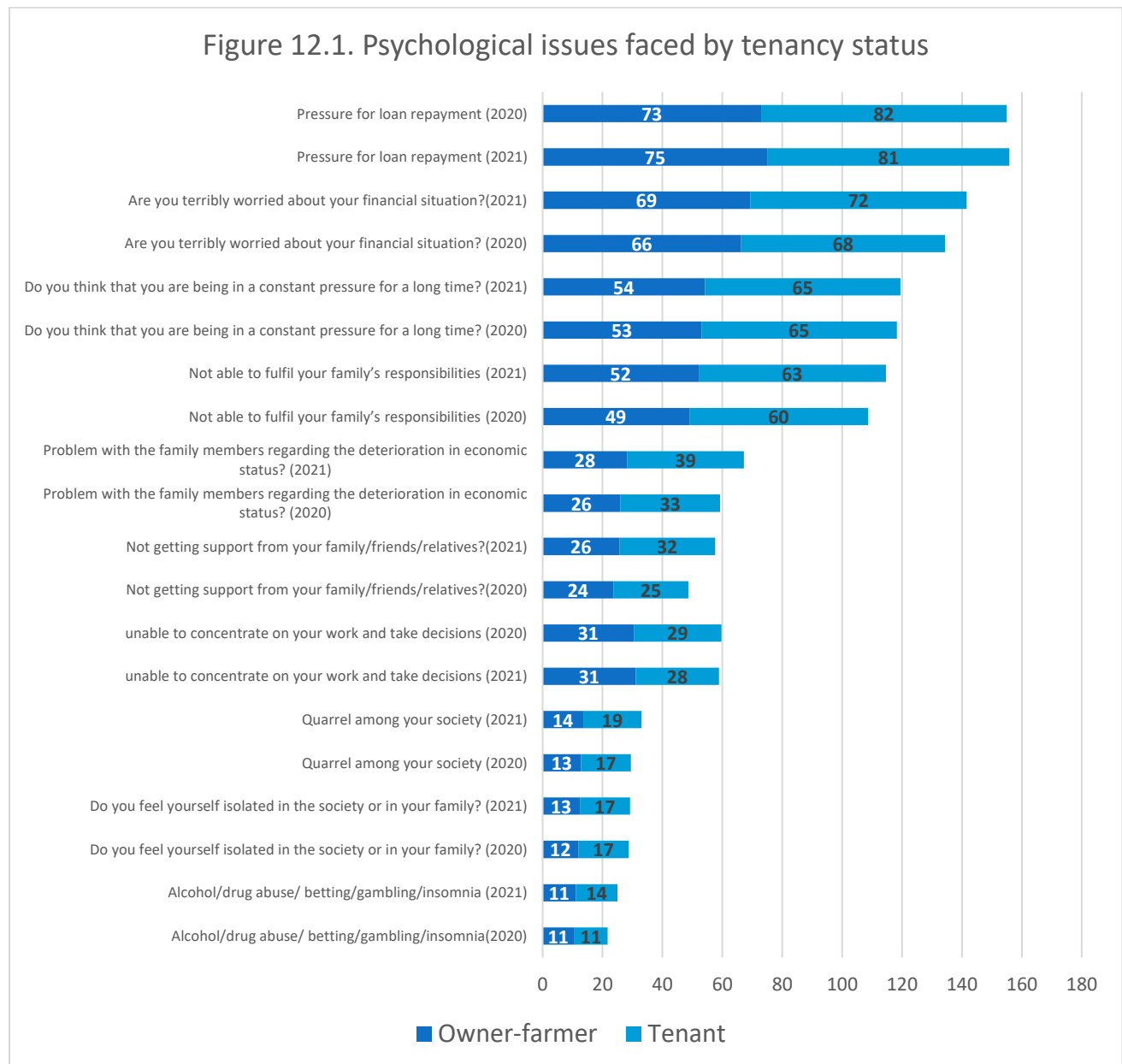
BPL	BPL2021			BPL2022		
	0	1	Total	0	1	Total
Do you feel yourself isolated in the society or in your family? (2020)	7	23	12	7	18	12
Do you feel yourself isolated in the society or in your family? (2021)	7	24	13	8	19	13
Pressure for loan repayment (2020)	72	77	74	74	73	74
Pressure for loan repayment (2021)	75	77	76	75	76	76
Quarrel among your society (2020)	7	25	13	9	18	13
Quarrel among your society (2021)	9	25	14	9	19	14
Not able to fulfil your family's responsibilities (2020)	49	50	50	49	51	50
Not able to fulfil your family's responsibilities (2021)	54	51	53	53	52	53
Not getting support from your family/friends/relatives?(2020)	21	29	24	20	29	24
Not getting support from your family/friends/relatives?(2021)	24	30	26	23	30	26
Are you terribly worried about your financial situation? (2020)	67	66	66	67	66	66
Are you terribly worried about your financial situation?(2021)	71	67	70	70	70	70
Problem with the family members regarding the deterioration in economic status? (2020)	23	33	26	23	30	26
Problem with the family members regarding the deterioration in economic status? (2021)	26	35	29	26	33	29
Alcohol/drug abuse/ betting/gambling/insomnia(2020)	11	10	11	13	8	11
Alcohol/drug abuse/ betting/gambling/insomnia (2021)	11	11	11	13	9	11
unable to concentrate on your work and take decisions (2020)	27	38	30	26	36	30
unable to concentrate on your work and take decisions (2021)	27	38	31	26	36	31
Do you think that you are being in a constant pressure for a long time? (2020)	49	63	54	52	56	54
Do you think that you are being in a constant pressure for a long time? (2021)	50	64	55	53	57	55

Psychological issues faced by the farmers who are pure tenant the below mentioned in table 12.6. In 2020, farmers who were pure tenant faced the highest Pressure for loan repayment which was 81.9 per cent, and farmers who were pure tenants at 73.0 per cent. In 2021 there was slight increase of Pressure for loan

repayment for farmers who were not pure tenants at 75.2 per cent. However there has been a decrease for farmers who are pure tenant at 80.6 per cent.

In 2020 farmers farmer also faced, that they were terribly worried about their financial situation, The farmers who were pure tenants were at 68.1 per cent and farmers who were not pure tenant at 66.3 per cent, this increased in 2021 for both framers who were pure tenants at 72.2 per cent tenants and 69.4 per cent for farmers who were not pure tenant as shown in figure 12.1.

Adding to that the next Psychological issues faced by the farmers is, thinking that they are being in a constant pressure for a long time, which is 65.3 per cent for farmers who are pure tenants, 53.0 per cent for farmers who are not pure tenants. There was a slight increase in 2021 for farmers who were not pure tenant at 54.2 per cent. However, there was no increase for farmers who were pure tenant in 2021.

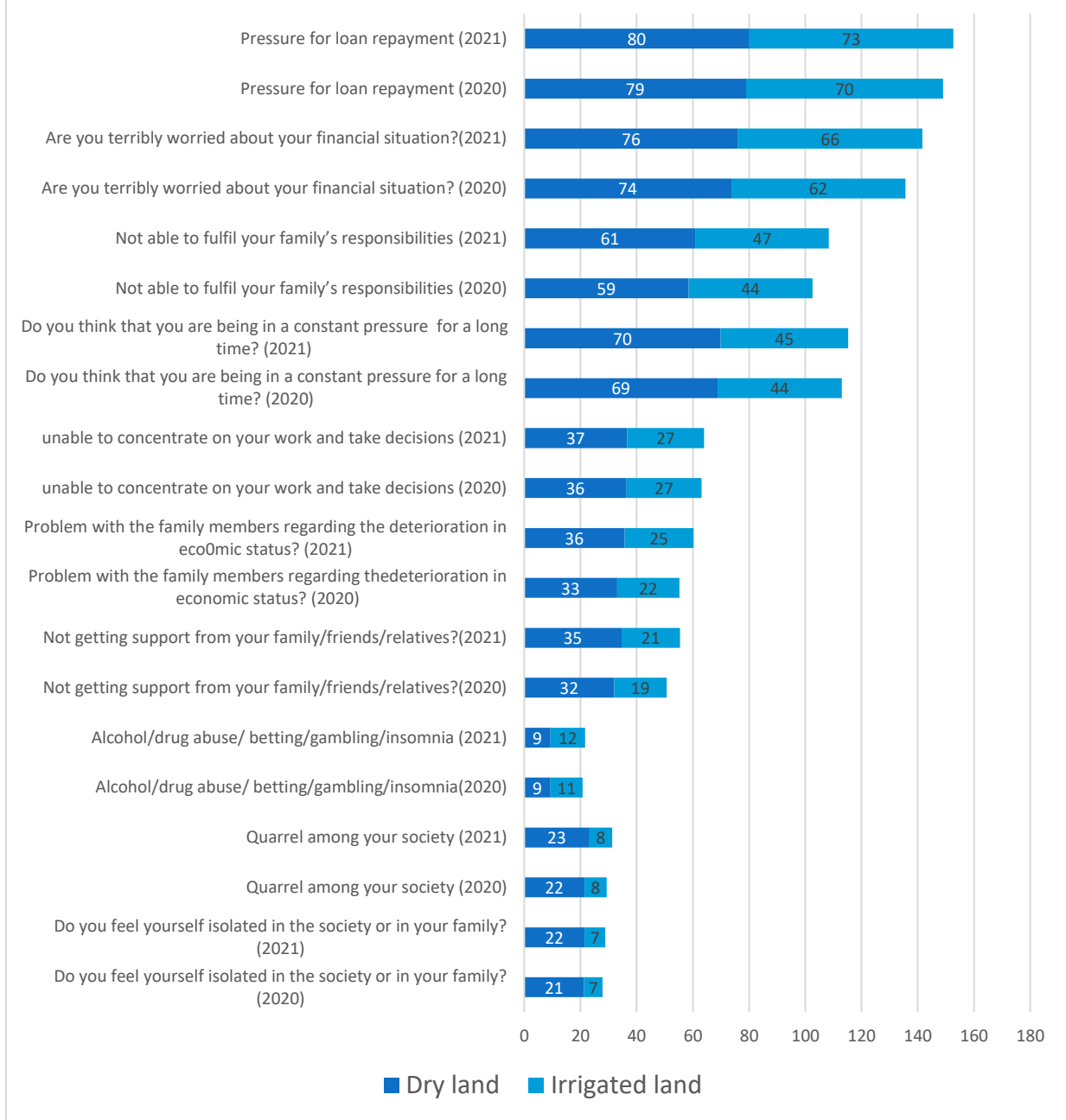


Psychological issues faced by the farmers who are dry land the below mentioned figure 12.2. In 2020, farmers who did not have Irrigated land faced the highest Pressure for loan repayment which was 78.9 per cent, and farmers who had irrigated land at 70.1 per cent. In 2021 there was increase of Pressure for loan repayment for farmers who did not have Irrigated land at 80.1 per cent and 72.6 per cent for the farmers who had Irrigated land.

In 2020 farmers farmer also faced, that they were terribly worried about their financial situation, The farmers who did not have Irrigated land were at 73.7 per cent and farmers who had at 61.9 per cent, this increased in 2021 for both framers who did not have Irrigated land at 76.1 per cent and 65.5 per cent for farmers who did not have Irrigated land as shown in figure 12.2.

Adding to that the next Psychological issues faced by the farmers is, thinking that they are being in a constant pressure for a long time, which is 68.8 per cent for farmers who did not have Irrigated land and 44.2 per cent for farmers who had dry land. There was a slight increase in 2021 for farmers who did not have irrigated land at 69.9 per cent and for farmers who had irrigated land at 45.4 per cent in 2021.

Figure 12.2. Psychological issues faced by irrigation status



Psychological issues faced by the farmers state wise in the below mentioned Table 12.6. In 2020, farmer's from Andhra Pradesh faced the highest Pressure for loan repayment which was 86.5 per cent, followed by farmers from Karnataka at 74.2 per cent and farmers from Telangana at 59.1 per cent, In 2021 there was an increase of Pressure for loan repayment in all three states. In Andhra Pradesh 87.1 per cent, Karnataka at 74.8 per cent and Telangana at 64.1. In 2020 farmers faced issue, that they were terribly worried about their financial situation, which 81. per cent for Andhra Pradesh, 62.1 per cent for Karnataka, 55.7 per cent for Telangana, this increased in 2021 for framers of all 3 states, Andhra Pradesh at 81.5 per cent, Karnataka at 67.3per cent and

Telangana at 59.6 per cent in 2021 as shown in the table 10.3. Adding to that the next psychological issues faced by the farmers is 0t able to fulfil your family’s responsibilities, which is 57.1 per cent for Andhra Pradesh, 47.7 per cent for Karnataka and 43.7 per cent for Telangana, there was an increase in 2021 for all 3 states.

**Table: 12.6. Psychological issues faced by farmers in different states**

State Name	Telangana	Karnataka	Andhra Pradesh	Total
Pressure for loan repayment (2021)	64	75	87	76
Pressure for loan repayment (2020)	59	74	87	74
Are you terribly worried about your financial situation?(2021)	60	67	82	70
Are you terribly worried about your financial situation? (2020)	56	62	81	66
Do you think that you are being in a constant pressure for a long time? (2021)	23	62	78	55
Do you think that you are being in a constant pressure for a long time? (2020)	22	60	77	54
Not able to fulfil your family’s responsibilities (2021)	49	51	58	53
Not able to fulfil your family’s responsibilities (2020)	44	48	57	50
unable to concentrate on your work and take decisions (2021)	30	18	45	31
unable to concentrate on your work and take decisions (2020)	28	17	46	30
Problem with the family members regarding the deterioration in economic status? (2021)	19	32	36	29
Problem with the family members regarding the deterioration in economic status? (2020)	18	25	36	26
Not getting support from your family/friends/relatives?(2021)	23	25	30	26
Not getting support from your family/friends/relatives?(2020)	21	21	29	24
Quarrel among your society (2021)	7	7	27	14
Quarrel among your society (2020)	6	6	27	13
Do you feel yourself isolated in the society or in your family? (2021)	5	5	27	13
Do you feel yourself isolated in the society or in your family? (2020)	5	4	28	12
Alcohol/drug abuse/ betting/gambling/insomnia(2020)	12	16	4	11
Alcohol/drug abuse/ betting/gambling/insomnia (2021)	15	15	4	11



## Chapter-13

### Risk Perception

Risk perception and decision-making by farmers are key factors that influence their adoption of new technologies and farming practices. Farmers are constantly making decisions that involve a certain level of risk, such as choosing which crops to plant, which inputs to use, and when to harvest. Risk perception refers to how farmers perceive and evaluate the potential risks and benefits of different options. Farmers may perceive risks differently based on their personal experiences, knowledge, and beliefs. For example, a farmer who has experienced crop failure due to a new technology may be more risk-averse than a farmer who has not. Decision-making by farmers involves weighing the perceived risks and benefits of different options and choosing the option that is expected to provide the greatest net benefit. This decision-making process is often influenced by a range of factors, including:

**Perceived probability and severity of risks:** Farmers may be more hesitant to adopt new technologies if they perceive the risks associated with them to be high and severe.

**Past experiences and knowledge:** Farmers may rely on past experiences and knowledge to guide their decision-making. This can lead to a reluctance to adopt new technologies if they have had negative experiences in the past.

**Availability of information:** Farmers need access to accurate and reliable information to make informed decisions. The lack of information or misinformation can lead to a reluctance to adopt new technologies.

**Social norms and pressure:** Farmers may be influenced by social norms and pressure from their peers and community. For example, if other farmers in the community are hesitant to adopt a new technology, it may discourage others from doing so as well.

**Economic factors:** Economic factors such as input costs, market demand, and profitability are also important considerations in decision-making.

Understanding the factors that influence risk perception and decision-making by farmers is crucial for designing effective interventions to promote the adoption of new technologies and farming practices. Efforts to provide accurate and reliable information, build knowledge and skills, and create supportive social networks can help to reduce perceived risks and encourage adoption.

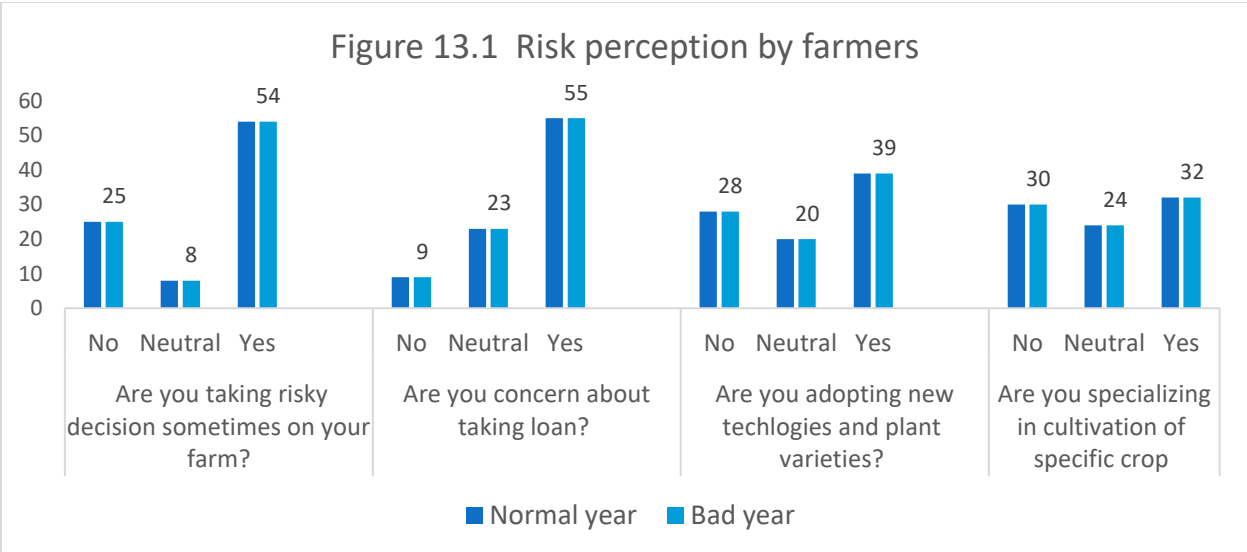
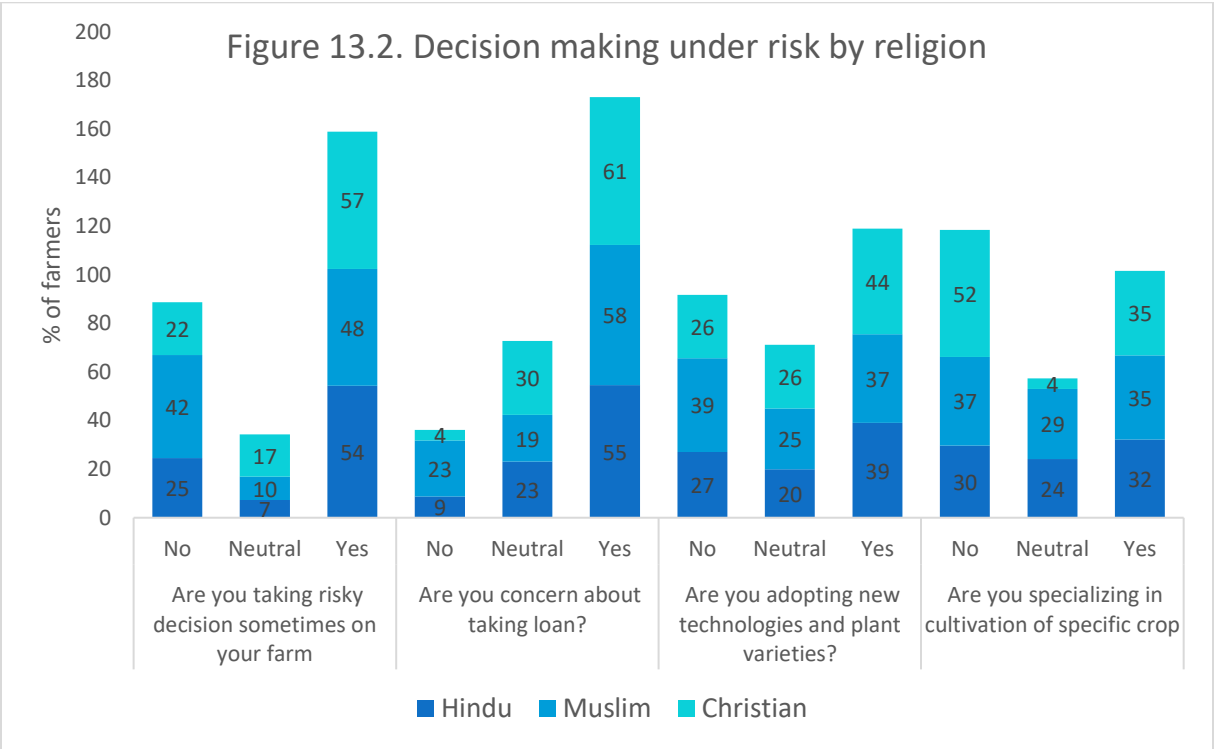


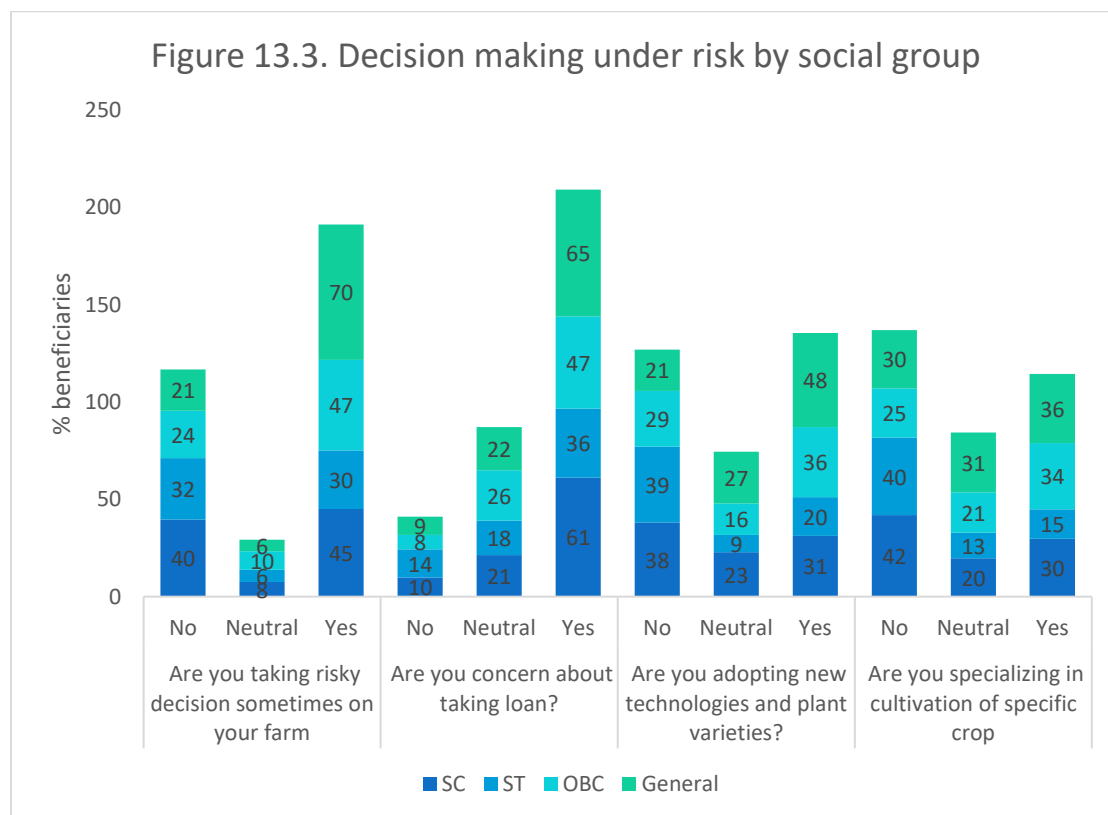
Figure 13.1 present decision making in risky conditions, about 54% of the farmers take risky decisions sometimes, about 55% of the farmers having concern of taking loans, about 39% of the farmers adopting new technologies and plant varieties, while 32 % of the farmers are specialised in specific crops. All these indicates that majority of the farmers are considered as risk takers in the sample farmers.

Risk decisions taken by the farmers based on their religion explained in the below mentioned Table 13.2. Christian farmers were most concerned about taking a loan at 60.9 per cent, followed by Muslim farmer who were concerned about taking a loan at 57.7 per cent and Hindu farmer who were concerned about taking loan at 54.5 per cent.



Risk perception psychological issues faced by the farmers based on social group explained in figure 13.3. General caste farmers were most concerned about taking a loan at 65.2 per cent, followed by SC caste farmer who were concerned about taking a loan at 61.1 per cent, then OBC farmer who were concerned about taking loan at 47.3 per cent and ST caste farmers who were concerned about taking loan at 35.6 per cent.

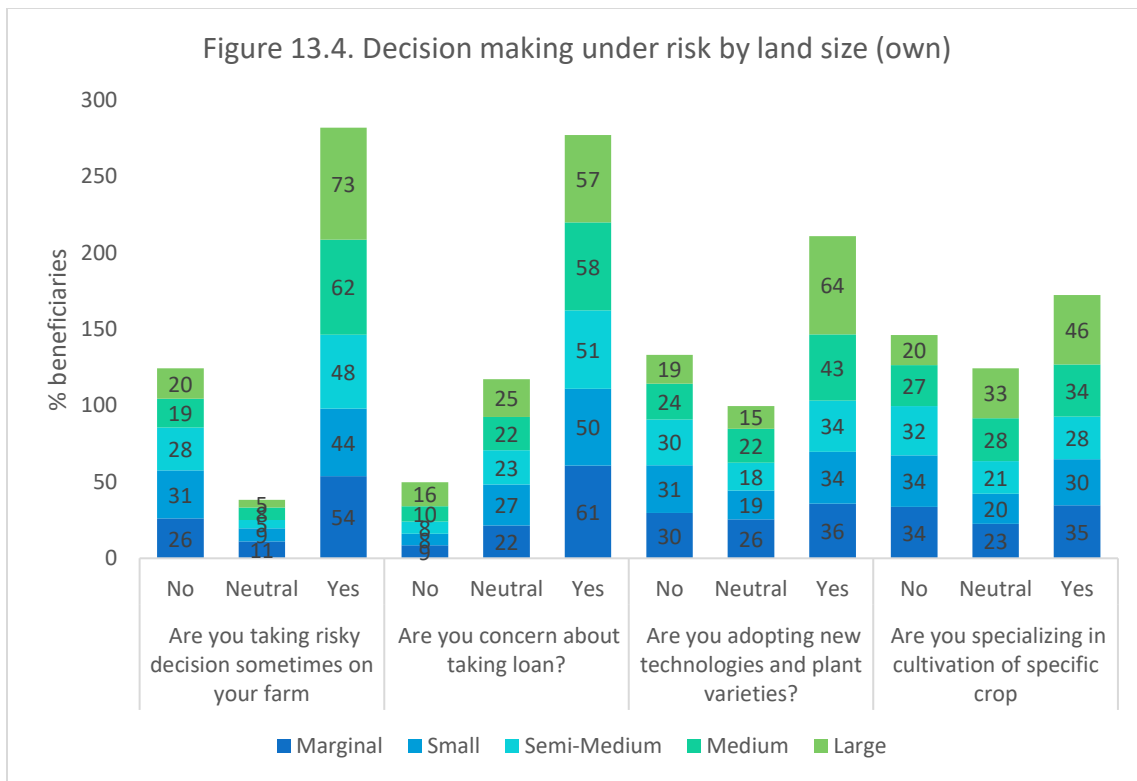
Another Psychological issue faced by the farmers was about taking risky recession sometimes on their farm, which was 69.5 per cent for General caste, 46.6 per cent for OBC, 45.0 per cent for SC and 30.1 for ST which is higher for all caste who do not take risky recession sometimes. on their farms.



Risk perception psychological issues faced by the farmers who have their own land explained in the below mentioned Table 13.4. Marginal land-owning farmers were most concerned about taking a loan at 60.28 per cent, followed by medium land-owning farmer who were concerned about taking a loan at 57.6 per cent, then large land owning farmer who were concerned about taking loan at 57.4 per cent, 51.4 per cent semi-medium owning land farmers and small owning land farmers who were concerned about taking loan at 50.2 per cent.

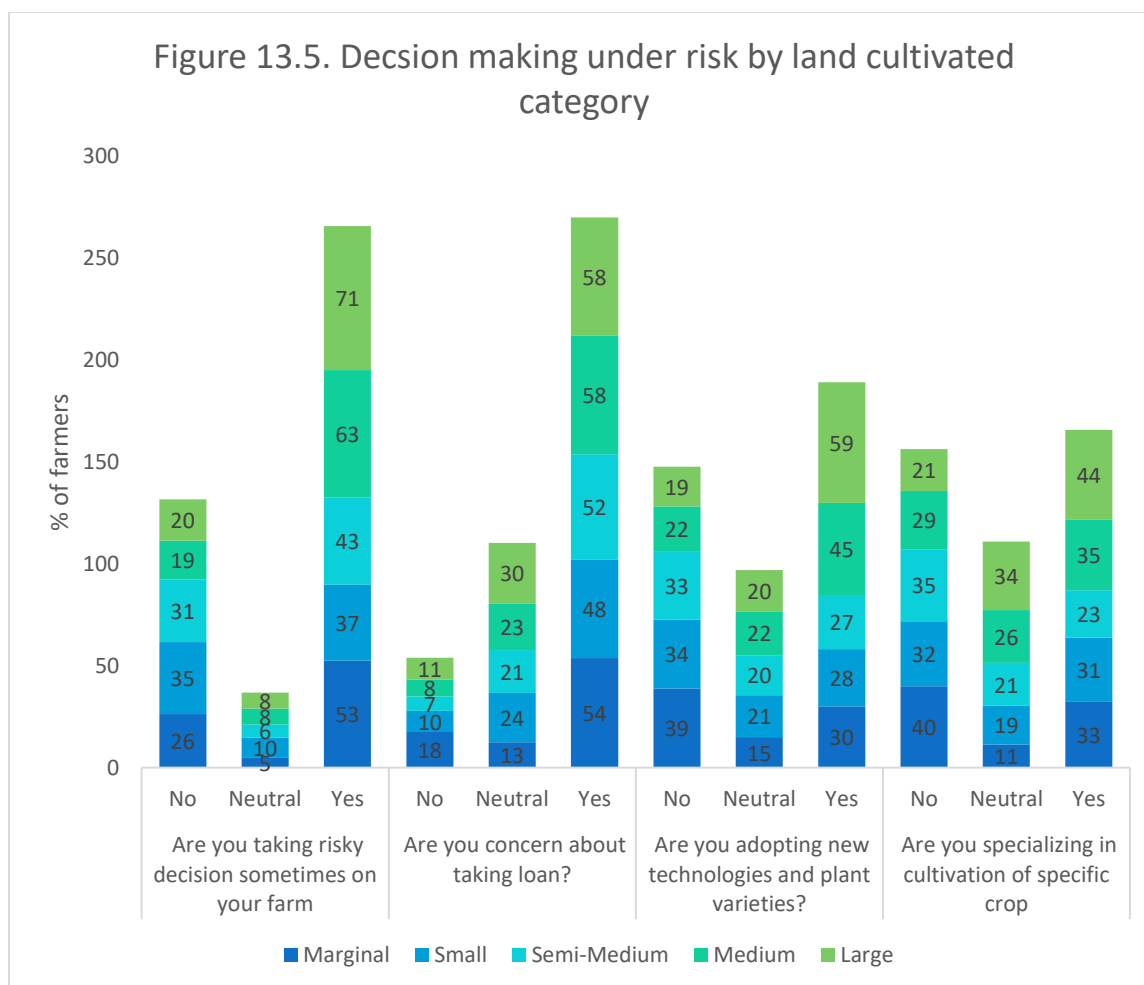
Another Psychological issue faced by the farmers was about taking risky decision sometimes on their farm, which was 73.3 per cent for large owning land farmers, 62.3 per cent for medium owning land farmers, 53.8 per cent marginal owning land farmers, 48.4 semi-medium owning land farmers and 44.3 per cent small owning land farmers, which is higher for all land who do not take risky decision sometimes on their farms.

Figure 13.4. Decision making under risk by land size (own)



Risk perception psychological issues faced by the farmers who have cultivated land explained in the below mentioned Table 13.5. Large cultivated land farmers were most concerned about taking a loan at 58.2 per cent, followed by medium cultivated land farmer who were concerned about taking a loan at 58.1 per cent, then Marginal cultivated land farmer who were concerned about taking loan at 53.8 per cent, 51.8 per cent semi-medium cultivated land farmers and small cultivated land farmers who were concerned about taking loan at 48.2 per cent.

Another psychological issue faced by the farmers was about taking risky decisions sometimes on their farm, which was 70.7 per cent for large cultivated land farmers, 62.5 per cent for medium cultivated land farmers, 52.5 per cent marginal cultivated land farmers, 42.8 semi-medium cultivated land farmers and 37.4 per cent small cultivated land farmers, which is higher for all cultivated land who do not take risky decisions sometimes on their farms.



Risk perception psychological issues faced by the farmers who are BPL and not BPL explained in table 13.1 for normal and bad years. Farmers who are BPL were most concerned about taking a loan at 56.4 per cent, farmers who are not below BPL concerned about taking a loan at 53.9 per cent.

Another Psychological issue faced by the farmers was about taking risky decision sometimes on their farm, which was 60.6 per cent for farmers who were BPL and 50.9 per cent for farmers who are not BPL which is higher for both farmer who are BPL and not BPL who do not take risky decision sometimes. on their farms.

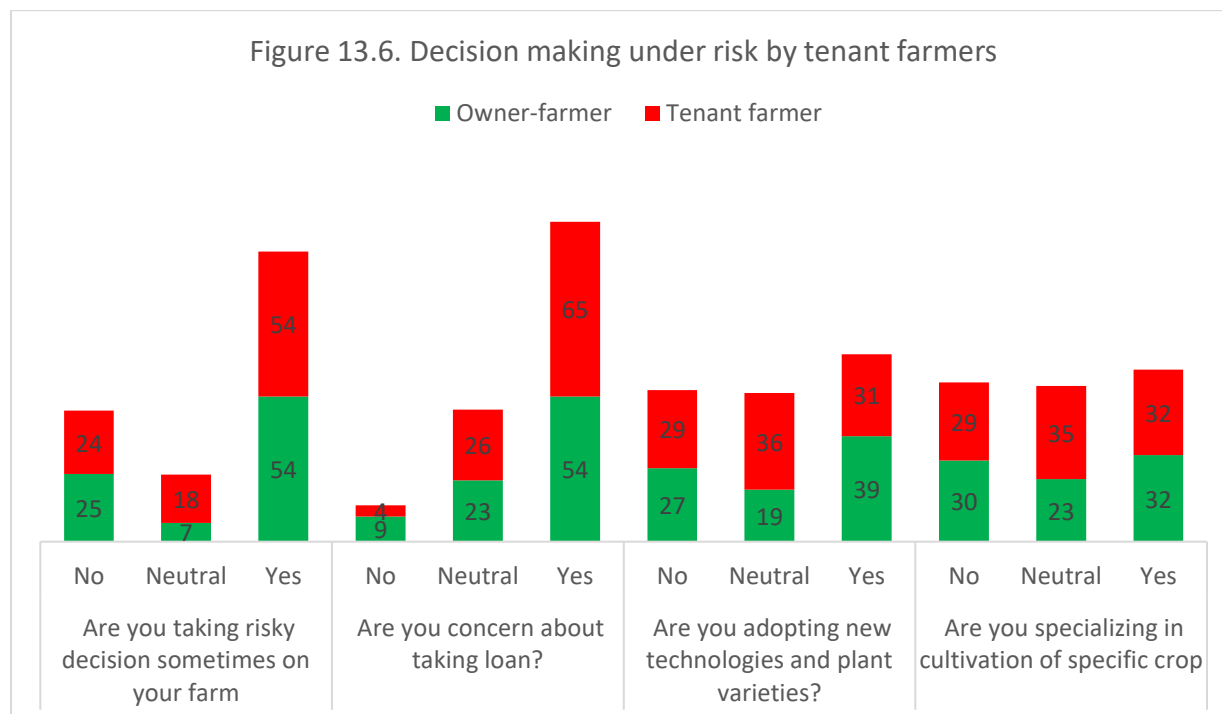
**Table: 13.1. Decision making under risk by poverty status**

	Normal year			Bad year		
	Non-poor	Poor	Total	Non-poor	Poor	Total
Are you taking risky decision sometimes on your farm-No	25	26	25	30	20	25
Are you taking risky decision sometimes on your farm- Neutral	7	8	8	8	8	8
Are you taking risky decision sometimes on your farm- Yes	51	61	54	51	58	54
Are you concern about taking loan?- No	7	13	9	9	10	9
Are you concern about taking loan?- Neutral	22	25	23	23	23	23
Are you concern about taking loan?-Yes	54	56	55	57	52	55

Are you adopting new technologies and plant varieties? - No	26	31	28	29	27	28
Are you adopting new technologies and plant varieties? - Neutral	19	24	20	20	21	20
Are you adopting new technologies and plant varieties? - Yes	39	39	39	41	37	39
Are you specializing in cultivation of specific crop - No	25	41	30	29	32	30
Are you specializing in cultivation of specific crop - Neutral	26	20	24	27	21	24
Are you specializing in cultivation of specific crop - Yes	32	32	32	33	32	32

Risk perception psychological issues faced by the farmers who are tenant and owner-farmer are given in figure 13.6. farmers were most concerned about taking a loan at 65.3 per cent for the farmers who were pure tenants and farmer who were not pure tenant were concerned about taking a loan at 54.2 per cent,

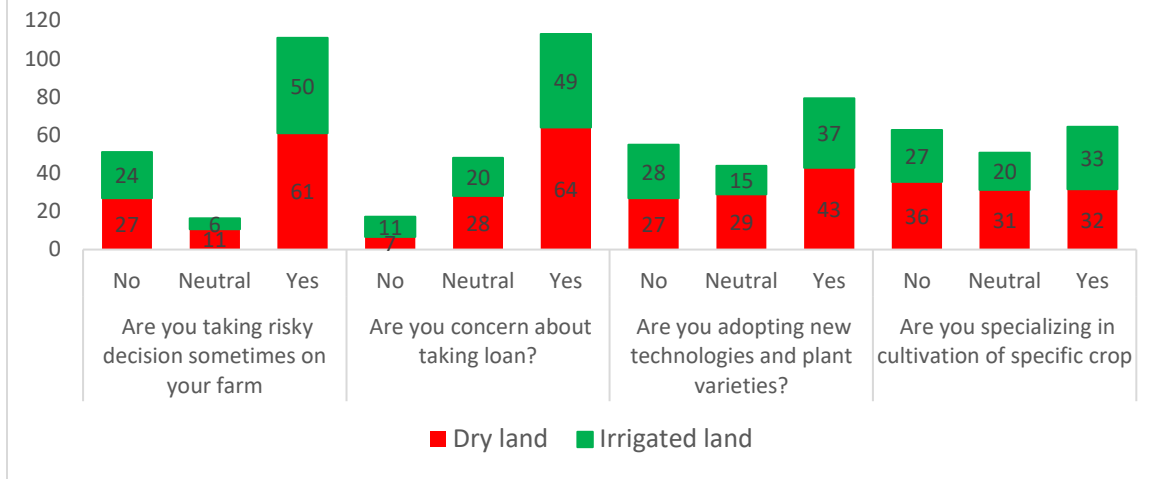
Another Psychological issue faced by the farmers who were pure tenant was about taking risky decision sometimes on their farm, which was 54.2 per cent and 54.2 per cent for farmers who were not pure tenant, which is higher for all farmers who were and were not pure tenants and did not take risky decision sometimes related to their farms.



Risk perception psychological issues faced by the farmers who had irrigated land explained in the below mentioned Table 13.7. Farmers were most concerned about taking a loan at 49.3 per cent for the farmers who had irrigated land and farmer who did not have irrigated land were concerned about taking a loan at 64.0 per cent.

Another Psychological issue faced by the farmers who had Irrigated land was about taking risky decisions sometimes on their farm, which was 49.9 per cent and 61.0 per cent for farmers who did not have Irrigated land, which is higher for all farmers who had Irrigated land and who did not have dry land and did not take risky decision sometimes on their farms.

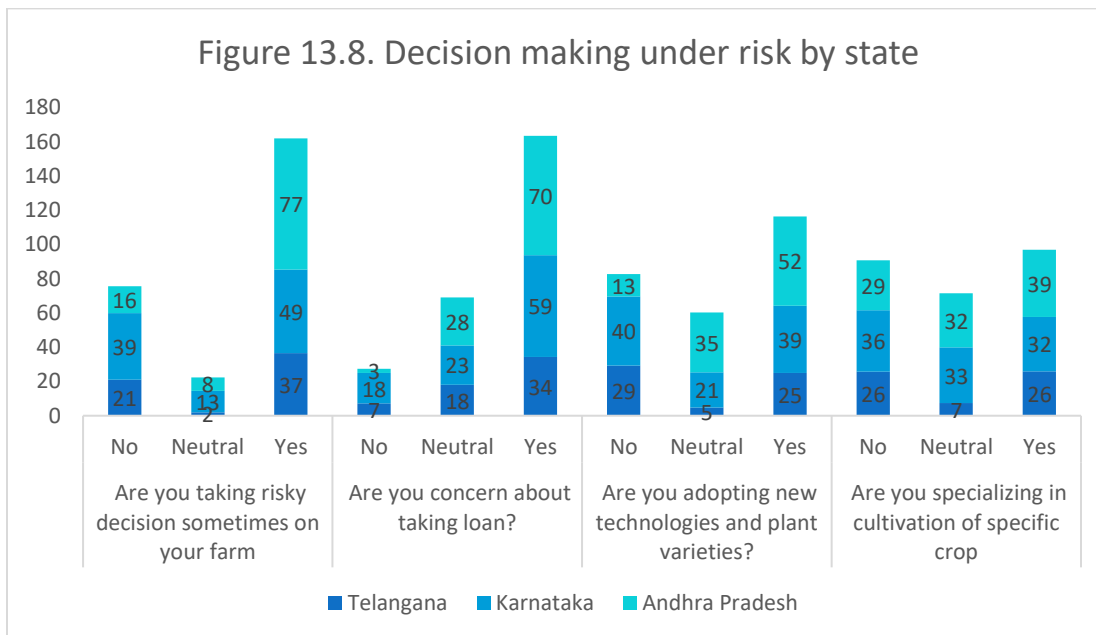
Figure 13.7. Decision making under risk by dryland and irrigated farmers



Risk perception psychological issues faced by the farmers in 3 states explained in figure 13.8. Farmers were most concerned about taking a loan at 69.6 per cent for the farmers were from Andhra Pradesh, followed by farmer from Karnataka at 64.0 per cent and farmers from Telangana at 34.3%.

Another Psychological issue faced by the farmers from the 3 states were about taking risky decision sometimes on their farm, which was 76.5 per cent for Andhra Pradesh, followed by Karnataka at 48.8 per cent and 36.5 per cent from Telangana, which is higher for all farmers from all 3 states who did not take risky decision sometimes. on their farms.

Figure 13.8. Decision making under risk by state



## **Chapter-14**

### **Cost of production, profits, crop loss and insurance claims**

Cost of production, profits, crop loss, and insurance claims are all important factors that affect the profitability and financial stability of farmers and agricultural businesses. The cost of production refers to the total expenses incurred in producing a crop, including inputs such as seeds, fertilizers, pesticides, labor, and equipment. Managing these costs is essential for farmers to maintain profitability and sustain their business over time. Profits, on the other hand, are the revenues earned from selling crops minus the cost of production. Profit margins are often tight in agriculture, making it crucial for farmers to maximize their yields and minimize their costs to increase their profits. Crop loss can occur due to a variety of factors such as weather events, pests, disease, or other unforeseen circumstances. These losses can significantly impact a farmer's income and overall financial stability, especially if they are not insured. Insurance claims provide financial protection to farmers who experience crop losses due to covered perils. By paying premiums, farmers can transfer the risk of crop losses to insurance companies, which will compensate them for their losses up to the limits of their coverage.

In summary, managing costs, maximizing profits, and protecting against crop losses through insurance are all critical factors for farmers and agricultural businesses to maintain financial stability and succeed in the industry.

#### **Yield Loss 2020-21**

The table 14.1 and 14.2 analyses the yield loss experienced by farmers in 2020-21 and 2021-22. The tables explain that, in rainfed area all 15 farmers had experienced crop loss in both years for paddy crop. The average area under paddy crop loss was 3 acres in 2020-21, whereas it was doubled in 2021-22 of about 6 acres in the same way production cost, total production, price received (Rs/q), income and profit were high in 2021-22 compared to previous year, whereas per cent yield loss was very high in 2021-22 of about 33 per cent compared to previous year of about 28 per cent. In irrigated area the number of farmers who faced crop loss increased from 82 to 83 members and in the same way average area under crop loss increased from 4 acres to 5 acres, only the production cost increase of about Rs 90,036 compared to previous year Rs. 89,146. The price received (Rs/q), income and profit were more in 2020-21 compared to 2021-22. There was no such variation in total production in paddy crop in both years, but little variation in the % yield loss of about 33 per cent in 2020-21 and 39 per cent in 2021-22. The average number of farmers who faced crop loss was higher in irrigated area compared to rainfed area in paddy crop.

The tables 14.1 and 14.2 shows that average area under cotton crop loss in rainfed area was 4.6 acres in 2020-21 whereas it decreased to 4.1 acres in 2021-22, in the same way number of cotton growers also increased from 373 to 377 members, whereas in irrigated area, it was same area of about 247 members decreased to 226 in 2021-22. Production cost was high of about Rs.1, 45,540 in 2021-22 for rainfed area compared to irrigated area of about Rs.1,09,920. Whereas, in rainfed production cost was higher of about Rs.1,66,233 compared to previous year. Total production was more in rainfed area in both years of about 26.3 and 20.5 qtls compared to irrigated area of about 23.3 and 18.1 qtls, decrease in total production in 2021-22 was due to increased incidence of pink boll worm in cotton crop. Per cent yield loss is high in rainfed area in both years compare to irrigated area, where as in 2021-22 per cent yield loss decreased from 60.5 to 49.7 per cent in rainfed area and 52.6 to 39.3 per cent in irrigated area. Cotton farmers obtained more income in rainfed area of year 2021-22 compared to 2020-21 of irrigated area, whereas occurrence of loss is high in rainfed crop in both years of about Rs.-26,507 and Rs.-8533, but in irrigated area there no losses in 2020-21 and 2021-22.

Number of farmers and average area under chilly crop increased from 202 to 225 members in rainfed areas and 394 to 421 members in irrigated area, there was an increase of farmers cultivated the chilly in 2021-22 than 2020-21. The production cost was high in 2021-22 because farmers started to use high dose of pesticides chemicals to overcome the heavy infestation of black thrips and mites which led to increase in production cost.



Total production was high in irrigated area of about 33.3qtls in 2020-21 in comparable with 2021-22 of about 35.0qtls in rainfed area, where as in 2021-22 the total production decreased drastically to 11.9qtls in both seasons due to natural calamities and high incidence of pest. Price received per quintal is high in 2021-22 total of about Rs. 1, 32,380 and it was less in 2020-21. In 2021-22 farmers who cultivated chilly are went to loss in both seasons, due to hailstorm and infestation of black thrips was more in chilly crop compare to previous year. The rainfed farmers received higher profit in 2021-22 of about Rs.1,24,512, whereas irrigated farmers received no loss of Rs. 1,74,055in same year.

**Table: 14.1. Farmers reported yield loss and profitability in 2020-21**

Crop Name		Area (acres)	Cost of production (Rs)	Production (q)	Price (Rs/q)	% Yield Loss	Income (Rs.)	Profit (Rs.)	
Cotton	Rainfed	Mean	4.6	166233	26.3	5321	60.5	144909	-26507
		N	373	373	373	357	265	357	372
	Irrigated	Mean	3.3	111816	23.3	5566	52.6	132093	20720
		N	247	247	247	241	139	242	247
	Total	Mean	4.1	144554	25.1	5420	57.8	139731	-7662
		N	620	620	620	598	404	599	619
Paddy	Rainfed	Mean	3.9	98354	92	1906	34	161167	56045
		N	96	96	96	95	40	95	96
	Irrigated	Mean	5.4	138940	122.6	1753	37.4	197213	62172
		N	498	498	498	498	174	497	495
	Total	Mean	5.2	132380	117.6	1777	36.8	191428	61177
		N	594	594	594	593	214	592	591
Chillies	Rainfed	Mean	3.1	281856	35	11163	60.5	427479	124512
		N	202	202	202	189	102	189	202
	Irrigated	Mean	3.1	248807	33.3	12420	51.6	430784	174055
		N	394	394	394	385	166	384	392
	Total	Mean	3.1	259908	33.8	12001	54.9	429259	156909
		N	597	597	597	575	269	574	595
Redgram	Rainfed	Mean	4.1	65370	12.3	5201	66.1	73569	568
		N	212	212	212	196	137	197	210
	Irrigated	Mean	3.9	60230	17.6	5417	57.9	108612	42042
		N	74	74	74	67	48	68	71
	Total	Mean	4	63904	13.6	5255	64.1	82269	10955
		N	287	287	287	264	186	266	282
Maize	Rainfed	Mean	3.7	95263	69.7	1685	50.3	116719	23802
		N	57	57	57	57	20	57	56
	Irrigated	Mean	3.3	72719	73	1930	29.5	169968	101137
		N	57	57	57	55	20	55	57
	Total	Mean	3.5	83991	71.3	1805	39.9	142868	62812
		N	114	114	114	112	40	112	113
Chickpea	Rainfed	Mean	5.2	98174	41.8	4780	53.8	130236	32975
		N	46	46	46	46	21	46	46
	Irrigated	Mean	9.1	152929	56.9	4814	40	896506	102514
		N	14	14	14	14	6	14	14
	Total	Mean	6.1	110950	45.4	4788	50.7	309032	49201
		N	60	60	60	60	27	60	60
Tobacco	Rainfed	Mean	4.3	203372	26.9	8907	51.7	249012	52233
		N	43	43	43	43	12	43	43
	Irrigated	Mean	3.2	111000	15.1	9050	45	140250	29250
		N	10	10	10	10	4	10	10
	Total	Mean	4	185943	24.7	8934	50	228491	47896
		N	53	53	53	53	16	53	53
Sorghum	Rainfed	Mean	3.2	59778	28.7	2594	44	63356	17047
		N	18	18	18	18	5	18	17
	Irrigated	Mean	5.5	82806	55.3	2323	39.5	122200	40719
		N	31	31	31	31	11	31	31
	Total	Mean	4.7	74347	45.5	2422	40.9	100584	32335
		N	49	49	49	49	16	49	48
Groundnut	Rainfed	Mean	2.8	49167	23.5	6583	10	112583	64500
		N	6	6	6	6	1	6	6
	Irrigated	Mean	2.7	56571	22.2	3876	40.7	95630	37053
		N	35	35	35	33	14	33	34
	Total	Mean	2.7	55488	22.4	4292	38.7	98238	41170
		N	41	41	41	39	15	39	40
Blackgram	Rainfed	Mean	4.2	104444	17.9	5394	58.3	142856	-2456
		N	18	18	18	16	6	16	18
	Irrigated	Mean	4	98750	20.8	5388	60	126375	1350
		N	10	10	10	8	4	8	10
	Total	Mean	4.1	102411	18.9	5392	59	137363	-1096
		N	28	28	28	24	10	24	28
Others	Rainfed	Mean	3.1	116618	36.3	5167	66.3	146845	18309
		N	70	68	66	60	30	60	67
	Irrigated	Mean	3.4	134125	210.9	5894	45	189891	35044
		N	60	60	58	55	18	55	57
	Total	Mean	3.2	124824	118	5514	58.3	167432	26002
		N	130	128	124	115	48	115	124
Total	Rainfed	Mean	4	151108	34.1	5901	59.4	183204	24489
		N	1141	1139	1137	1083	639	1084	1133
	Irrigated	Mean	4.1	154039	70.9	5863	46.7	246592	84015
		N	1430	1430	1428	1397	604	1397	1418
	Total	Mean	4.1	152708	54.5	5881	53.3	218795	57518
		N	2573	2571	2567	2482	1245	2483	2553

## 14.2. Farmers reported yield loss and profitability in 2021-22

Crop Name		Area (acres)	Cost of production (Rs)	Production (q)	Price (Rs/q)	% Yield Loss	Income (Rs.)	Profit (Rs.)	
Cotton	Rainfed	Mean	4.1	145540	20.5	6466	49.7	141064	-8533
		N	377	377	377	363	377	377	376
	Irrigated	Mean	3.3	109920	18.1	7026	39.3	128417	19603
		N	226	226	224	218	226	226	224
	Total	Mean	3.8	132190	19.6	6676	45.8	136324	1971
		N	603	603	601	581	603	603	600
Paddy	Rainfed	Mean	4	103645	79.3	1703	25.1	133977	33266
		N	100	100	99	97	100	100	99
	Irrigated	Mean	5.7	146793	118.4	1755	19.1	191015	44299
		N	463	463	462	460	463	463	462
	Total	Mean	5.4	139129	111.5	1746	20.1	180884	42352
		N	563	563	561	557	563	563	561
Chillies	Rainfed	Mean	3.3	296476	14.9	12026	66.6	281725	-112936
		N	225	225	222	177	225	225	221
	Irrigated	Mean	3.2	259742	10.3	13953	66	142711	-107527
		N	421	421	420	290	421	421	412
	Total	Mean	3.2	272502	11.9	13211	66.2	191019	-109448
		N	647	647	643	468	647	647	634
Redgram	Rainfed	Mean	4.1	67594	9.9	6135	53.3	60664	-3367
		N	213	213	210	156	213	213	208
	Irrigated	Mean	4.1	61459	13.7	6324	53.2	80036	23066
		N	74	74	72	63	74	74	71
	Total	Mean	4.1	66012	10.9	6189	53.3	65659	3360
		N	287	287	282	219	287	287	279
Maize	Rainfed	Mean	4	101228	72.1	1754	21.4	125103	22660
		N	50	50	50	49	50	50	49
	Irrigated	Mean	3.2	70932	62.4	1973	20.1	111589	46158
		N	59	59	59	57	59	59	58
	Total	Mean	3.6	86785	69	1871	20.5	121626	37292
		N	110	110	110	107	110	110	108
Chickpea	Rainfed	Mean	5.3	102143	37.1	4798	27.8	125160	26497
		N	49	49	49	48	49	49	47
	Irrigated	Mean	9.7	181200	61.1	4879	25.3	285547	104347
		N	15	15	15	14	15	15	15
	Total	Mean	6.3	120672	42.7	4816	27.2	162751	45331
		N	64	64	64	62	64	64	62
Tobacco	Rainfed	Mean	4.6	222273	30.9	9297	9.1	290512	68239
		N	33	33	33	33	33	33	33
	Irrigated	Mean	2.6	91667	13.1	8125	27.8	109444	17778
		N	9	9	9	8	9	9	9
	Total	Mean	4.2	194286	27.1	9068	13.1	251712	57426
		N	42	42	42	41	42	42	42
Sorghum	Rainfed	Mean	4	63458	40.7	3657	24.2	94854	31396
		N	24	24	24	23	24	24	24
	Irrigated	Mean	6.1	79808	56.4	2587	30	119963	43342
		N	26	26	26	23	26	26	25
	Total	Mean	5.1	71960	48.9	3122	27.2	107911	37491
		N	50	50	50	46	50	50	49
Groundnut	Rainfed	Mean	2.5	42143	23.4	6871	2.9	124429	182286
		N	7	7	7	7	7	7	7
	Irrigated	Mean	3.3	72214	27.4	4189	12.9	122193	53907
		N	28	28	28	27	28	28	28
	Total	Mean	3.2	66200	26.6	4741	10.9	122640	79583
		N	35	35	35	34	35	35	35
Blackgram	Rainfed	Mean	6	151630	15.7	5532	57	93322	-58304
		N	23	23	23	19	23	23	23
	Irrigated	Mean	3.3	82292	10.5	10445	45	61075	-21217
		N	12	12	12	11	12	12	12
	Total	Mean	5.1	127857	13.9	7333	52.9	82266	-45589
		N	35	35	35	30	35	35	35
Total	Rainfed	Mean	4	151339	28	6534	46.4	152801	-16110
		N	1176	1175	1165	1038	1176	1176	1160
	Irrigated	Mean	4.2	162792	59.2	6154	39.3	152782	-5559
		N	1396	1394	1386	1220	1396	1396	1374
	Total	Mean	4.1	157645	45.1	6328	42.5	152928	-10337
		N	2574	2571	2553	2260	2574	2574	2536

## Input use pattern

The table 14.3 presents input use pattern of cotton, paddy and chillies. It is to be noted that all the inputs use was more than recommended in case of chillies, as farmers expected that more use of inputs may lead to more output. But unfortunately, the more use of pesticides (they use more than 10 times that of recommended dose) and resulted in higher costs which was not accompanied by the profitability. As a result, whenever there is yield loss, chilli farmers lost more than Rs. One lakh per acre, where as the loss was less in both cotton and paddy. Returns from paddy are more stable, but they are at lower level.

**Table: 14.3. Input usages by farmers for different crop**

Crop	State	Area (acre)		Seed (kg)		Urea (bags)		DAP (bags)		No. of sprays/week		Yield(q)		Price (Rs/q)	
		2021	2021	2021	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021	2022
Cotton	Telangana	4.3	4.2	1	1	2.5	2.5	1.6	1.5	7	7	5.9	4.6	5986	6682
	Karnataka	4	3.9	1	1	1.8	1.9	2.1	2	6	6	7.6	6.3	5026	6842
	AP	4.9	4	1	1	2	2	1.8	1.8	6	6	5.9	5.2	5438	5998
	All	4.4	4	1	1	2	2.1	1.9	1.8	6	6	6.5	5.5	5421	6433
Paddy	Telangana	4.1	4.2	27	27	2.9	2.9	1.7	1.8	4	4	22.8	17.5	1967	2031
	Karnataka	9.7	9.5	27	27	2.6	2.6	2.4	2.3	2	2	24.2	22.7	1412	1470
	AP	4.7	4.6	28	28	2.6	2.5	2.2	2.2	2	2	21.3	20.3	1564	1636
	All	6.3	6.2	27	27	2.8	2.8	2	2	3	3	23.1	19.8	1699	1768
Chillies	Telangana	2.3	2.4	0.5	0.6	3.8	3.9	2.5	2.6	20	28	13.9	4.8	12290	14120
	Karnataka	5.6	6	0.6	0.5	2.6	2.6	3.8	3.8	12	12	10.4	4.9	13695	13650
	AP	2.5	2.6	0.5	0.6	2.8	2.8	3.1	3.1	12	12	9.4	4.8	9908	11315
	All	3.1	3.4	0.5	0.5	3.2	3.3	3	3	16	19	11.8	4.8	11998	13084
Maize	Telangana	2.3	2.4	8	8	1.7	2	1.5	1.2	3	3	22.3	15.8	1758	1810
	Karnataka	3.3	3.3	6	6	2.3	2	2.3	2.5	3	3	19.7	19.5	2067	2250
	AP	5.2	6.5	8	8	2.1	2.1	1.7	1.6	3	3	19.6	21.8	1702	1758
	All	4.2	5	8	8	2	2.1	1.7	1.6	3	3	20.4	19.8	1767	1824

## Marketed surplus and utilization pattern of different crop output

Table 14.4 shows the utilization pattern for a year of different crops produced in the study area by household consumption, seed stored for next season, marketable surplus and marketed quantity. The house hold consumption of Paddy was high (6.5qntls) followed by Sorghum (2.5qntl), Groundnut(0.5qntl), Red gram(0.4qntl),Chickpea, Black gram, others (0.3qntl) and Chillies, Maize(0.1qntl). Most farmers in the study area were not storing there produce for seed purpose for next season, except for Groundnut(0.5qntl) and Red gram, Black gram(0.1qntl) which is a negligible number for farmers. From the table 14.1, it was evident that only few farmers were storing their produce for selling in upcoming season, most of the produce of crops were sold immediately after harvesting either in village markets, MSP, APMCs or private agency's due to nonavailability of storage facilities and high cost for storing produce in cold storages, go downs etc.

**Table: 14.4. Utilization patterns of different crops in study area:**

Crop Names	Production (qtls)	Household consumption (qtls)	Stored for seed (qtls)	Marketable surplus (qtls)	Marketed quantity (qtls)	Marketed quantity as % of production
Cotton	22.2	0	0	22.2	22.2	100
Paddy	118	6.5	0	111.5	111.5	94.5
Chillies	21.5	0.2	0	21.3	21.3	99.1
Red gram	12.2	0.4	0.1	11.7	11.7	95.9
Maize	79.3	0.2	0	79.1	79.1	99.7
Chickpea	31.3	0.3	0	31	31	99.0
Tobacco	25.9	0	0	25.9	25.9	100
Sorghum	48.4	2.5	0	45.9	45.9	94.8
Groundnut	23.1	0.5	0.4	22.2	22.2	96.1
Black gram	18.9	0.3	0.1	18.5	18.5	97.9

### **Crop loss and insurance claim in normal and bad year**

Although crop loss in chillies are uniform across states in year 2021-22, the claims were very less in Karnataka (where PMFBY was implemented), while claims payment was huge and also timely in Andhra Pradesh, where YSR- zero premium crop insurance. In case of Telangana farmers didn't get any claims as there is no crop insurance scheme (Table 14.5).

YSR zero premium crop insurance is a state specific crop insurance scheme implemented by AP state government while PMFBY (Pradhan Mantri Fasal Bima Yojana) offered by government of India pan-India scheme. Although both schemes aim to provide financial protection to farmers in case of crop losses, there are some differences between them.

**Premium:** YSR zero premium crop insurance scheme provides crop insurance coverage to farmers without any premium payment. On the other hand, PMFBY requires farmers to pay a premium, which is subsidized by the government.

**Coverage:** Under the YSR scheme, farmers are eligible for a maximum insurance coverage of Rs. 1.5 lakh per acre. In contrast, the PMFBY provides coverage up to the maximum sum insured per hectare, which varies based on the crop type and the area of cultivation. But in actual there are some problems in implementation of the scheme like cumbersome documentation, procedures, payment of premium although small require lot of efforts from farmers side like time-taking enrollment process.

**Risks covered:** Coverage is more or less like losses due to natural calamities, including drought, floods, and cyclones, pests and diseases.

**Claim settlement:** Under the YSR scheme, the claims are settled based on the yield loss assessment conducted by the local revenue department officials. In contrast, PMFBY claims are settled based on crop cutting experiments (CCE) conducted by insurance companies or other authorized agencies, which is again a cumbersome process.

In summary, the YSR zero premium crop insurance scheme provides insurance coverage without any premium payment and also easy for enrollment by farmers with little procedures in both enrolment and claims payment. As a result, many farmers are able to get claims timely. The satisfactory levels are high among the farmers in its effectiveness and efficiency. PMFBY, on the other hand, requires farmers to pay a subsidized premium, lot of procedure involved both in enrolment and claim settlement and farmers are not happy with implementation efficiency and effectiveness. Many farmers complained about not receiving claims even though they lost crop.

**Table: 14.5. Insurance claims under different crops**

State Name	Crops		Loss claimed in 2020-21 (Rs)	Claim amount received in 2020-21 (Rs.)	Loss claimed in 2021-22 (Rs.)	Claim amount received in 2021-22 (Rs.)	
Telangana	Cotton	Mean	20000		75000		
		N	1		1		
	Chillies	Mean	30000				
		N	1				
	Total	Mean	25000		75000		
		N	2		1		
Karnataka	Cotton	Mean	83560	30750	101400	12000	
		N	15	4	5	1	
	Paddy	Mean	82625	13750	29500	24000	
		N	8	4	4	1	
	Chillies	Mean	30000		40000		
		N	3		2		
	Red gram	Mean	33000	14320	27250		
		N	14	5	8		
	Chickpea	Mean	22500		70000		
		N	2		1		
	Sorghum	Mean	18125	12500	15000		
		N	8	4	1		
	Others	Mean	17500		515000	320000	
		N	2		2	1	
	Total	Mean	51758	17624	88609	118667	
		N	52	17	23	3	
	Andhra Pradesh	Cotton	Mean	175991	91651	69070	19114
			N	56	56	115	117
Paddy		Mean	26040	15900	58300	32500	
		N	10	10	2	2	
Chillies		Mean	58000	12100	145055	96529	
		N	3	3	73	75	
Red gram		Mean	22219	16888	80785	42872	
		N	16	16	79	82	
Maize		Mean	5000	22000	0	50000	
		N	2	2	1	1	
Chickpea		Mean			150000	30000	
		N			1	1	
Black gram		Mean	95000	38000	35947	26671	
		N	2	2	19	21	
Others		Mean	39167	41667	70394	59992	
		N	3	3	33	35	
Total		Mean	119162	63510	87265	47295	
		N	92	92	323	334	

Total	Cotton	Mean	154568	87591	70455	19054
		N	72	60	121	118
	Paddy	Mean	51189	15286	39100	29667
		N	18	14	6	3
	Chillies	Mean	42000	12100	142253	96529
		N	7	3	75	75
	Red gram	Mean	27250	16276	75862	42872
		N	30	21	87	82
	Maize	Mean	5000	22000	0	50000
		N	2	2	1	1
	Chickpea	Mean	22500		110000	30000
		N	2		2	1
	Sorghum	Mean	18125	12500	15000	
		N	8	4	1	
	Black gram	Mean	95000	38000	35947	26671
		N	2	2	19	21
	Others	Mean	30500	41667	95800	67215
		N	5	3	35	36
	Total	Mean	93865	56354	87319	47930
		N	146	109	347	337

Note: N= number of farmers

## **Chapter-15**

### **Loan waivers**

Farmers loan waivers in India refer to the government's decision to waive off agricultural loans owed by farmers to banks and other financial institutions. This policy has been implemented by various state and central governments in India over the years as a measure to provide relief to distressed farmers who are unable to repay their loans due to various reasons such as crop failure, natural calamities, low crop prices, etc. However, while farmers loan waivers provide some relief to farmers in the short term, they also have some negative impacts on the agricultural sector and the economy as a whole. Some of the potential negative impacts of farmers loan waivers include:

**Fiscal burden:** Farmers loan waivers put a significant fiscal burden on the government, which can impact other sectors of the economy. The funds allocated for loan waivers could be used for other important development projects.

**Moral hazard:** Loan waivers can create a moral hazard by incentivizing farmers to default on their loans in the hope of getting them waived in the future. This can lead to a vicious cycle of debt and dependence on government support.

**Credit discipline:** Loan waivers can undermine credit discipline among farmers and lenders, making it harder for farmers to access credit in the future.

**Inequity:** Loan waivers may benefit some farmers while leaving others out, creating inequity in the distribution of benefits.

**Long-term impact on the banking sector:** Loan waivers can have a long-term impact on the banking sector, making it harder for banks to recover loans and impacting their lending practices.

In conclusion, while farmers loan waivers provide some immediate relief to farmers, they can have negative long-term impacts on the economy and the agricultural sector. It is important for the government to adopt sustainable measures that address the root causes of agricultural distress and promote sustainable agriculture practices to ensure the long-term well-being of farmers and the economy.

#### **History of loan waivers in India**

Loan waivers for farmers have been a recurring policy measure in India, with both central and state governments implementing such schemes over the years. Here is a brief history of farmer loan waivers in India:

**1990s:** The first large-scale loan waiver for farmers in India was implemented in 1990 by the government of Prime Minister V.P. Singh. The waiver covered loans of up to Rs 10,000 taken by small and marginal farmers. Several state governments followed suit, announcing their own loan waiver schemes for farmers.

**2008:** The government of India announced a Rs 60,000 crore (\$14 billion) loan waiver scheme for farmers as part of its efforts to address rural distress. The scheme covered loans taken by farmers up to March 2007.



2014: The newly elected government of Prime Minister Narendra Modi announced a Rs 52,000 crore (\$7.7 billion) loan waiver scheme for farmers in its first budget. The scheme was aimed at providing relief to distressed farmers in the wake of poor monsoons.

2017: Several state governments, including Uttar Pradesh, Maharashtra, and Punjab, announced loan waiver schemes for farmers in response to widespread protests by farmers over the issue of agrarian distress.

2018: The government of Karnataka announced a loan waiver scheme for farmers in its budget. The scheme covered loans of up to Rs 2 lakh taken by farmers from nationalized and cooperative banks.

It is worth noting that while loan waivers provide temporary relief to farmers, they also have some negative consequences as mentioned earlier. Many experts argue that the focus should be on addressing the root causes of agricultural distress, such as low farm incomes, inadequate irrigation facilities, and lack of market access, rather than relying on loan waivers as a solution.

**Table: 15.1. Beneficiaries of loan waive off by Religion (Rs)**

Religion	Hindu		Total	
	Mean	N	Mean	N
Commercial Banks (2020-21)	40929	1.0	40929	1.0
Commercial Banks (2021-22)	48500	0.3	48500	0.3
Regional Rural Bank (2020-21)	18250	0.3	18250	0.3
Cooperative societies/banks (2020-21)	55333	0.4	55333	0.4
Cooperative societies/banks (2021-22)	50000	0.1	50000	0.1
Traders (2020-21)	30000	0.1	30000	0.1
Total loan waiver (formal, 2021)	42522	1.7	42522	1.6
Total loan waiver (informal, 2021)	30000	0.1	30000	0.1
Total loan waiver (formal, 2022)	49000	0.4	49000	0.4

Note: % of households

According to table 15.1, only 1.1 per cent of farmer gained from loan waiver of amount about Rs. 40,929 from commercial bank followed by Regional Rural banks (0.3%) and cooperative societies (0.4%) of amount Rs. 18,250 and Rs. 55,333 in the year 2020-21, where as in 2021-22 only 0.3 per cent of farmer received loan waiver of about Rs. 48,500 from commercial bank and Rs. 50,000 from Cooperative societies.

**Table: 15.2. Beneficiaries of loan waive off by social category (Rs)**

Caste	SC		ST		OBC		General	
	Mean	N	Mean	N	Mean	N	Mean	N
Commercial Banks (2020-21)	29500	3.1	50000	1.4	48333	1.1	32500	0.3
Commercial Banks (2021-22)	20000	0.8		0.0	20000	0.2	77000	0.3
Regional Rural Bank (2020-21)		0.0	25000	1.4	11500	0.4		0.0
Cooperative societies/banks (2020-21)		0.0		0.0	45500	0.7	75000	0.3
Cooperative societies/banks (2021-22)		0.0		0.0	50000	0.2	50000	0.2
Traders (2020-21)		0.0		0.0	30000	0.4		0.0
Total loan waiver (formal, 2021)	29500	3.1	37500	2.7	45000	2.0	53750	0.7
Total loan waiver (informal, 2021)		0.0		0.0	30000	0.4		0.0
Total loan waiver (formal, 2022)	20000	0.8		0.0	35000	0.4	68000	1

In the study mentioned in table 15.2, in 2020-21 the commercial bank 3.1 per cent of farmers benefited from loan waiver belonging to SC farmers followed by ST farmers of about 1.4 per cent and only 1.1 per cent of farmers benefited from loan waiver belonged to other backward classes and 0.3 from other category, whereas in 2021-22 only 0.8 per cent of ST farmers and 0.2 per cent of other category farmers benefited from loan waiver ,but RRBs provide loan waiver only in 2020-21 for 1.4 per cent of ST farmers and 0.4 per cent of other backward class farmers. Only 0.7 per cent of other backward class farmers and other category farmers got benefited from loan waiver from cooperative societies /bank in 2020-21, In 2021-22 0.2 per cent of other category farmer benefited from loan waiver from same bank.

**Table: 15.3. Beneficiaries of loan waive off by own land size category (Rs.)**

	Marginal		Small		Semi-Medium		Medium	
	Mean	N	Mean	N	Mean	N	Mean	N
Commercial Banks (2020-21)	39000	2.5	50000	2.4	24000	0.4	30000	0.2
Commercial Banks (2021-22)	100000	0.5	20000	0.8		0.0	54000	0.2
Regional Rural Bank (2020-21)		0.0	25000	0.8	11500	0.4		0.0
Cooperative societies/banks (2020-21)	100000	0.5	50000	0.4	45500	0.9		0.0
Cooperative societies/banks (2021-22)		0.0	50000	0.4	50000	0.2		0.0
Traders (2020-21)	20000	0.5		0.0	40000	0.2		0.0
Total loan waiver (formal, 2021)	49167	3.0	50000	3.1	31625	1.8	30000	0.2
Total loan waiver (informal, 2021)	20000	0.5		0.0	40000	0.2		0.0
Total loan waiver (formal, 2022)	100000	0.5	30000	1.2	50000	0.2	54000	0.2

Table 15.3 shows the loan waiver from different banks based on total land owned, in 2020-21 2.5 per cent of marginal farmers received loan waiver of amount Rs. 39,000 followed by 2.4 per cent of small farmers of Rs. 50,00 and only 0.4 per cent of semi-medium farmers of Rs. 30,000 from commercial bank in next year 0.8 per cent of small farmers of Rs. 20,000, 0.5 per cent of marginal received loan waiver from the commercial banks. 0.8 per cent of small farmers received loan waiver of about Rs.25,000 and 0.4 per cent of semi-medium received loan waiver

of Rs. 11,500 from RRBs, in 2020-21. The cooperative societies/ bank provided loan waiver of 0.9 per cent to semi-medium farmers and 0.5 percent of marginal farmers to Rs.1,00,000 in 2020-21, whereas in 2021-22 only 0.4 per cent of small and 0.2 per cent medium farmers benefited from loan waiver of Rs. 50,000 from cooperative societies/ bank.

**Table 15.4. Beneficiaries of loan waive off by cultivated land category**

Total cultivated land wise-2022	Marginal		Small		Semi-Medium		Medium		Large	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Commercial Banks (2020-21)	40000	5.0	42500	2.1	42667	0.7	32500	0.4	50000	0.4
Commercial Banks (2021-22)		0.0	60000	1.0	20000	0.2	54000	0.2		0.0
Regional Rural Bank (2020-21)		0.0	25000	1.0	11500	0.5		0.0		0.0
Cooperative societies/banks (2020-21)		0.0		0.0	50000	0.5	75000	0.4	41000	0.9
Cooperative societies/banks (2021-22)		0.0		0.0	50000	0.2		0.0	50000	0.4
Traders (2020-21)		0.0		0.0		0.0	30000	0.4		0.0
Total loan waiver (formal, 2021)	40000	5.0	36667	3.1	35857	1.7	53750	0.8	66000	0.9
Total loan waiver (informal, 2021)		0.0		0.0		0.0	30000	0.4		0.0
Total loan waiver (formal, 2022)		0.0	60000	1.0	35000	0.5	54000	0.2	50000	0.4

**Table 15.5. Beneficiaries of loan waive off by poverty status of households (Rs.)**

	BPL2021						BPL2022					
	Non-poor		Poor		Total		Non-poor		Poor		Total	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Commercial Banks (2020-21)	42538	1	20000	0	40929	1	46000	1	38111	1	40929	1
Commercial Banks (2021-22)	37000	0	60000	0	48500	0	77000	0	20000	0	48500	0
Regional Rural Bank (2020-21)	17667	0	20000	0	18250	0	20000	0	16500	0	18250	0
Cooperative societies/banks (2020-21)	55333	1		0	55333	0	46400	1	100000	0	55333	0
Cooperative societies/banks (2021-22)	50000	0		0	50000	0	50000	0		0	50000	0
Traders (2020-21)	20000	0	40000	0	30000	0	30000	0		0	30000	0
Total loan waiver (formal, 2021)	44667	2	20000	0	42522	2	45636	1	39667	2	42522	2
Total loan waiver (informal, 2021)	20000	0	40000	0	30000	0	30000	0		0	30000	0
Total loan waiver (formal, 2022)	43500	0	60000	0	49000	0	63500	1	20000	0	49000	0

Note: N= % of total households; zero indicates less than one %.

The table 15.4 explained that occurrence of loan waiver was more in 2020-21 compared to 2021-22. In all cultivated size farmers, the commercial bank provided loan waiver to 5 per cent of farmers who are having < 1 acre of land benefited from loan waiver in 2020-21, followed by farmers with cultivated land size of 1-2 acres ( 2.1 %), 0.4 per cent to the farmer having more than 10 acres of land in 2021-22. Only 1 or 2 per cent of farmers benefited from loan waiver from

commercial bank. Whereas farmers having cultivated size less than one acre and one to two benefited from loan waiver from RRBs in 2020-21. As observed, occurrence of loan waiver is more for farmers having low cultivated land compared to farmers having high cultivated land.

The above table 15.5 shows loan waive off of households based on BPL cards available with households in year 2020-21 The result shows that in 2020-21 1 per cent of farmers received benefit of loan waive off who are having and not having BPL card from commercial banks. Similarly,1 per cent of farmers who are having and not having BPL card received loan waive off about Rs.20,000 and Rs.50,000. The regional rural banks (RRBs) and cooperative societies provide loan waive off to the farmers who are not having BPL cards in the year 2020-21.

**Table 15.6. Beneficiaries of loan waive off by tenancy status (Rs)**

PureTenant-2022	Owner-farmer		Tennant-farmer	
	Mean	N	Mean	N
Commercial Banks (2020-21)	40929	1.0		0.0
Commercial Banks (2021-22)	31333	0.2	100000	1.4
Regional Rural Bank (2020-21)	18250	0.3		0.0
Cooperative societies/banks (2020-21)	46400	0.4	100000	1.4
Cooperative societies/banks (2021-22)	50000	0.1		0.0
Traders (2020-21)	40000	0.1	20000	1.4
Total loan waiver (formal, 2021)	39909	1.6	100000	1.4
Total loan waiver (informal, 2021)	40000	0.1	20000	1.4
Total loan waiver (formal, 2022)	38800	0.4	100000	1.4

The above table 15.6 shows Study of loan waive off of households based on Pure Tenants available with household in year 2021-22revealed in table 16.6 that in 2020-21 1.0 per cent of farmers received benefit of loan waive off pure tenant from commercial banks, similarly 0.4 per cent of farmers who were having and 2.4 per cent of farmers who had and did not have were pure tenant received loan waive off of about Rs.46000 and Rs. 55,333. The cooperative societies provided loan waive of to the farmers who had and did not have pure tenants both years. Further the study data showed that RRBs provided benefit of loan waive off to just 0.3 per cent of farmers of Rs. 18,250 to farmers who did not have BPL card in 2020-21.

**Table 15.7. Beneficiaries of loan waive off by irrigation status (Rs.)**

Irrigated land wise	Dry land		Irrigated land	
	Mean	N	Mean	N
Commercial Banks (2020-21)	18000	0.2	42692	1.5
Commercial Banks (2021-22)	100000	0.2	31333	0.3
Regional Rural Bank (2020-21)		0.0	18250	0.5
Cooperative societies/banks (2020-21)	66000	0.4	50000	0.5
Cooperative societies/banks (2021-22)		0.0	50000	0.2
Traders (2020-21)	30000	0.4		0.0
Total loan waiver (formal, 2021)	50000	0.6	41400	2.3
Total loan waiver (informal, 2021)	30000	0.4		0.0
Total loan waiver (formal, 2022)	100000	0.2	38800	0.6

The above table 15.7 shows Study of loan waive off of Irrigated land in year 2021-22 revealed in table 15.7 that in 2020-21, 1.5 per cent of farmers received benefit of loan waive off who had Irrigated land from commercial banks, similarly 0.2 per cent of farmers who were having and 2.4 per cent of farmers who had and did not have were pure tenant received loan waive off of about Rs.46000 and Rs. 55,333. The cooperative societies provided loan waive of to the farmers who had and did not have pure tenants both years. Further the study data showed that RRBs provided benefit of loan waive off to just 0.3 per cent of farmers of Rs. 18,250 to farmers who did not have BPL card in 2020-21.

**Table: 15.8. Beneficiaries of loan waive off by State (Rs.)**

State Name	Telangana		Karnataka		Andhra Pradesh		Total	
	Mean	N	Mean	N	Mean	N	Mean	N
Commercial Banks (2020-21)	40929	3.0		0.0		0.0	40929	1.0
Commercial Banks (2021-22)	48500	0.9		0.0		0.0	48500	0.3
Regional Rural Bank (2020-21)	18250	0.9		0.0		0.0	18250	0.3
Cooperative societies/banks (2020-21)	55333	1.3		0.0		0.0	55333	0.4
Cooperative societies/banks (2021-22)	50000	0.4		0.0		0.0	50000	0.1
Traders (2020-21)		0.0	40000	0.2	20000	0.2	30000	0.1
Total loan waiver (formal, 2021)	42522	5.0		0.0		0.0	42522	1.6
Total loan waiver (informal, 2021)		0.0	40000	0.2	20000	0.2	30000	0.1
Total loan waiver (formal, 2022)	49000	1.3		0.0		0.0	49000	0.4

The above table 15.8 shows Study of loan waive off for farmers of 3 states in 2020-21 and 2021-22. In 2020-21 3 per cent of farmers received benefit of loan waives off of RS 40929 and in 2021-21 0.9 percent of farmers received benefit of loan waive of RS 48,500 for the state of Telangana from commercial banks, Karnataka and Andhra Pradesh did not receive any waiver off of loan. Similarly, 0.9 per cent of farmers from Telangana received loan waive off, of about Rs.18,000 from the RRBs, again Karnataka and Andhra Pradesh did not receive any waiver off of loan. The cooperative societies provided loan waive of to the farmers the state of Telangana of 1.3 percent of about RS 55,333in 2020-21 and 0.4 per cent of about RS 50,000 in 2021-21, Karnataka and Andhra Pradesh did not receive any waiver off loan.

## **Chapter-16**

### **Farmers Distress Index**

The Farmers Distress Index is a tool used to measure the level of distress faced by farmers in India. The index is based on various indicators that reflect the economic, social, and psychological well-being of farmers. These indicators include crop prices, input costs, agricultural credit, irrigation facilities, access to markets, and other socio-economic factors.

The Farmers Distress Index was first developed by the National Sample Survey Office (NSSO) in 2003. The index was later revised and updated in 2016 by the National Commission on Farmers (NCF), which was set up by the government of India to address the issues of agricultural distress.

The updated Farmers Distress Index comprises 16 indicators, which are grouped into four broad categories: (i) production, (ii) access to inputs and technology, (iii) marketing and prices, and (iv) indebtedness and suicide. The index is calculated at the district level, and higher scores indicate higher levels of distress faced by farmers in the district.

The Farmers Distress Index is a useful tool for policymakers, researchers, and other stakeholders to identify the regions and communities that are most affected by agricultural distress and to develop targeted interventions to address the issues. However, it is important to note that the index is only one of many tools available for measuring agricultural distress and that a multi-dimensional approach is needed to effectively address the challenges faced by farmers.

This study developed a FDI by using methodology mentioned in the methodology chapter. The FDI is based on seven pillars of farmer's distress. The seven pillars of the FDI are exposure, adaptive capacity, sensitivity, adaptation, trigger, psychology and impact. Each pillar is a composite index of three indicators. Total 21 variables were used to calculate FDI. The details of the indicators considered while calculating the FDI is given in table 16.1

The table 16.2 presents the seven pillars of the FDI according to religion, social group, land size category, poverty status, irrigation status and tenancy status of the households for the year 2021-22 which is a bad year. Although, 2021-22 is not an abnormal year in terms of rainfall and weather indicators, farmers lost heavily due to their low level of adaptive capacity and adaptation after the severe pest attack on chilli crop.

Adaptive capacity and adaptation are related concepts in the field of climate change and sustainability, but they refer to different aspects of a system's ability to cope with and respond to changes. Adaptive capacity refers to the inherent ability of a system, whether it be a natural or human system, to adjust and cope with changes in its environment or circumstances. This can include factors such as diversity, flexibility, and the availability of resources or infrastructure that can be used to respond to changes. In other words, adaptive capacity is the potential or readiness to adapt. Adaptation, on the other hand, refers to the actual changes that a system undergoes in response to environmental or other changes, in order to maintain or improve its functioning. Adaptation can involve a range of strategies, from small-scale adjustments to more significant transformations, and can occur in response to both anticipated and unanticipated

changes. In summary, adaptive capacity refers to a system's potential for adaptation, while adaptation refers to the actual process of adjusting to changing circumstances.

Table 16.1. Explanation of indicators used in FDI.

Pillar	Indicator-1	Indicator-2	Indicator-3
Exposure	Loss due to pest/diseases (%)	Floods/cyclones (%)	Droughts (%)
Adaptive capacity	Average education of the household (years)	Total owned land (acre)	Leased-in land (acre)
Sensitivity	Irrigated area (% of total area)	Indebtedness (Rs)	SC/SC community and number of children in household
Adaptation	Non-crop income (as % of total household income)	Number of government schemes household benefited (number)	Household savings with SHGs and Cooperatives through membership (Rs.)
Trigger	Informal credit (Rs)	Pressure from repayment of loans (yes/no)	Lack of capital for investment in agriculture (yes/no)
Psychological	Feeling of social isolation (yes/no)	Unable to fulfil family obligations (yes/no)	Addicted to alcohol (yes/no)
Impact	Increased indebtedness (Yes/No)	More participation in public works (MGNREGA) (yes/no)	Reduced food consumption (yes/no)

Note: Variables highlighted in yellow are inversely related with FDI.

The three indicators of adaptive capacity are education level of households, land size and leased-in land. With the low level of education farmers are unable to adapt swiftly to pest attacks and depended on the pesticide dealers, who recommended huge doses of pesticides (that is more than 10 times the recommended practices) and resulted in increase in cost of cultivation and also huge loss due to low yields, in spite of higher prices. Similarly, farmers have small landholdings, which are not suitable for growing high-return-high-risk crops, who generally don't have risk bearing ability. Again, many farmers leased-in land to cultivate commercial crops like chillies and ended up huge losses in addition to the payment of land-rent.

The variables considered for adaptation are (i) non-crop income (as % of total household income), (ii) number of government schemes household benefited (number) and (ii) household savings with SHGs and Cooperatives through membership (Rs.). Non-crop income is very low among the sample farmers compared to all-India comparable indicators. Although, a plethora of government schemes are working, they are all general in nature and not responsive to distress. The schemes like PMFBY is working, it is having its own problems like many farmers not received claims, if they received they are suffering from delay payments. Household savings are very low and negligible among the households when compared to their indebtedness. Government and farmers have to take steps to increase both adaptive capacity and adaptation

among the farmers so that the FDI will be reduced. There is a significant variation in the FDI at below district level.

Table 16.2. Farmers Distress Index (FDI) among different category of farmers

Religion	Exposure	Adaptive capacity	Sensitivity	Adaptation	Trigger	Psychology	Impact	FDI
Hindu	0.17	0.56	0.26	0.63	0.35	0.25	0.25	0.35
Muslim	0.12	0.57	0.25	0.66	0.26	0.24	0.26	0.34
Cristian	0.18	0.59	0.52	0.54	0.39	0.36	0.32	0.41
Social group								
SC	0.17	0.56	0.45	0.60	0.37	0.26	0.31	0.39
ST	0.19	0.54	0.36	0.66	0.34	0.28	0.33	0.39
OBC	0.17	0.56	0.21	0.61	0.34	0.25	0.29	0.35
OC	0.16	0.57	0.25	0.64	0.35	0.25	0.20	0.35
Land ownership status								
Marginal	0.16	0.60	0.34	0.60	0.37	0.25	0.25	0.36
Small	0.17	0.58	0.28	0.60	0.35	0.28	0.28	0.36
Medium	0.17	0.57	0.26	0.63	0.33	0.26	0.29	0.36
Semi-medium	0.18	0.55	0.25	0.64	0.36	0.25	0.24	0.35
Large	0.15	0.46	0.24	0.70	0.33	0.20	0.14	0.32
Land cultivated status								
Marginal	0.15	0.58	0.23	0.57	0.33	0.18	0.24	0.32
Small	0.15	0.57	0.28	0.61	0.34	0.27	0.27	0.36
Medium	0.17	0.57	0.26	0.62	0.33	0.27	0.29	0.36
Semi-medium	0.18	0.56	0.28	0.63	0.36	0.26	0.25	0.36
Large	0.17	0.56	0.26	0.67	0.35	0.23	0.19	0.35
Poverty status								
Non-Poor	0.16	0.56	0.25	0.66	0.34	0.25	0.25	0.35
Poor	0.18	0.57	0.28	0.58	0.36	0.27	0.27	0.36
Tenancy status								
Owner	0.17	0.56	0.26	0.63	0.35	0.25	0.26	0.35
Tenant	0.15	0.61	0.49	0.63	0.37	0.31	0.24	0.40
State								
Telangana	0.20	0.57	0.17	0.61	0.34	0.23	0.28	0.34
Karnataka	0.12	0.54	0.28	0.70	0.32	0.24	0.23	0.35
Andhra Pradesh	0.19	0.58	0.35	0.57	0.38	0.30	0.25	0.37
Total	0.17	0.56	0.27	0.63	0.35	0.26	0.26	0.35



Table 16.3. Sub-district level (block wise) FDI

State/Block	Exposure	Adaptive capacity	Sensitivity	Adaptation	Trigger	Psychology	Impact	FDI
<b>Telangana</b>								
Dornakal	0.24	0.58	0.14	0.60	0.33	0.29	0.32	0.36
Duggondi	0.12	0.56	0.22	0.48	0.39	0.13	0.49	0.34
Mhahboobabad	0.25	0.55	0.21	0.67	0.34	0.29	0.28	0.37
Nallabelli	0.16	0.57	0.13	0.60	0.40	0.28	0.21	0.33
Narsampet	0.17	0.56	0.11	0.58	0.35	0.23	0.31	0.33
Tirumalayapalem	0.20	0.57	0.24	0.60	0.33	0.22	0.25	0.34
Wyra	0.20	0.59	0.15	0.69	0.29	0.17	0.20	0.33
<b>Total</b>	<b>0.20</b>	<b>0.57</b>	<b>0.17</b>	<b>0.61</b>	<b>0.34</b>	<b>0.23</b>	<b>0.28</b>	<b>0.34</b>
<b>Karnataka</b>								
Ballari	0.17	0.54	0.21	0.63	0.38	0.29	0.28	0.36
Maski	0.12	0.53	0.41	0.70	0.25	0.26	0.28	0.36
Shahapur	0.11	0.54	0.26	0.72	0.30	0.22	0.15	0.33
Shorapur	0.12	0.54	0.30	0.72	0.30	0.19	0.20	0.34
Siruguppa	0.13	0.56	0.23	0.68	0.34	0.25	0.22	0.35
Sirwar	0.09	0.54	0.29	0.72	0.33	0.22	0.26	0.35
<b>Total</b>	<b>0.12</b>	<b>0.54</b>	<b>0.28</b>	<b>0.70</b>	<b>0.32</b>	<b>0.24</b>	<b>0.23</b>	<b>0.35</b>
<b>AP</b>								
Amaravathi	0.21	0.59	0.39	0.60	0.39	0.28	0.19	0.38
Darsi	0.21	0.58	0.20	0.53	0.35	0.23	0.27	0.34
Durgi	0.21	0.57	0.34	0.56	0.36	0.32	0.26	0.37
Kanchikacherla	0.14	0.62	0.35	0.57	0.40	0.26	0.19	0.36
Kankipadu	0.08	0.60	0.25	0.65	0.41	0.35	0.28	0.37
Kurichedu	0.21	0.56	0.42	0.55	0.43	0.29	0.27	0.39
Veerullapadu	0.17	0.59	0.40	0.58	0.38	0.38	0.26	0.40
Veldurthi	0.13	0.56	0.37	0.56	0.42	0.42	0.25	0.39
Veldurthi	0.23	0.56	0.40	0.55	0.35	0.21	0.38	0.38
Total	0.19	0.58	0.35	0.57	0.38	0.30	0.25	0.37

### Scaling up to the Sub-District Level

The geographical areas of the districts in India are vast and heterogenous; climatic shocks such as droughts and floods are often localized and occur only in a specific part of the district rather than the entire district. Hence, there is a need for developing the FDI at the sub-district level (*mandal*/block: every district is sub-divided into *mandals*/blocks in India, and each district comprises about 30–40 *mandals*/blocks); within the *mandal*, the entire area is homogenous. The sub-district is also the lowest level administrative unit for the majority of the government departments, such as agriculture, rural development, women and child development, and revenue, which makes it easy for different line departments of the government to make actionable decisions based on the FDI. Hence, the FDI was calculated at the *mandal* level as presented in Table 16.3, depicting the different levels of severity of the farmers' distress with

different symbols derived from the FDI. This mapping will be a powerful tool to identify clusters of high FDI scores and their dimensions (Khan and Salman, 2012; Said et al., 2011).

The *mandals*/blocks of the districts may be categorized into three groups in terms of FDI values. It was revealed that within districts, there is a large degree of variability in the level of FDI. This verifies that, as a prioritization and planning tool, the FDI has to be measured at the *mandal*/block level to capture variability at the sub-district level [(Ray and Sai, 2012; Said et al., 2011; Murthy et al., 2014; Patnaik et al., 2013; Kaul and Thornton, 2014).

Category A *mandals*/blocks (demarcated as Red): Severe *mandal*/block distress (top 30% of the *mandals*).

Category B *mandals*/blocks (demarcated as Yellow): Moderate *mandal* distress (30 to 60% of the *mandals*).

Category C *mandals* (demarcated as Green ): Low *mandal* distress (bottom 40% of *mandals*).

Dryland farmers face many challenges, such as uncertain rainfall, prolonged dry spells, late onset of monsoons, rising production costs, outbreaks of natural disasters, biotic stresses such as diseases and pest attacks, fluctuations in market prices, etc. Combining all these variables into one composite FDI at the lowest level of the administrative unit and disseminating the information to all stakeholders will help with decision-making. Accordingly, the current study measured the vulnerability of dryland farmers by developing the FDI at the *mandal* level. The results revealed that agricultural vulnerability at the sub-district level is more beneficial for the prioritization and planning process as districts have a great deal of variability.

## Chapter-17

### Conclusion

Drylands, which are characterized by low precipitation and high evaporation rates, cover about 40% of the Earth's land surface and are home to over 2 billion people. Despite their arid conditions, drylands have a great potential for supporting human livelihoods and ecosystems if managed properly. Here are some of the potential benefits and challenges of drylands:

**Agricultural productivity:** Dryland areas have the potential to support agriculture through the use of drought-tolerant crops and efficient water management practices such as rainwater harvesting and drip irrigation. By adopting sustainable land management practices, farmers can increase crop yields and improve soil health, which can contribute to food security and rural development.

**Renewable energy:** Many dryland areas have high solar radiation levels and are ideal for the production of solar energy. Wind and geothermal energy can also be harnessed in certain regions. The development of renewable energy sources can not only reduce dependence on fossil fuels but also promote economic development in remote and underserved areas.

**Biodiversity conservation:** Despite their harsh conditions, drylands support a wide range of unique and specialized plant and animal species that are adapted to survive in low-water environments. By protecting these ecosystems and restoring degraded lands, we can conserve biodiversity and maintain important ecological functions such as soil stabilization and carbon sequestration.

**Water scarcity:** One of the main challenges of drylands is water scarcity. The availability and distribution of water are critical factors for human and ecological well-being in these regions. Climate change, population growth, and unsustainable land use practices can exacerbate water stress and lead to conflicts over water resources.

**Poverty and inequality:** Drylands are often associated with poverty, food insecurity, and social inequality. The lack of economic opportunities, poor infrastructure, and limited access to basic services such as health care and education can perpetuate poverty cycles in these regions. Addressing these challenges requires a multi-dimensional approach that promotes sustainable development, social inclusion, and environmental conservation.

**Agrarian distress** refers to the economic, social, and psychological hardships faced by farmers and rural communities due to various factors such as crop failure, low crop prices, rising input costs, indebtedness, lack of irrigation facilities, and adverse weather conditions.

Over the years, farmers practiced traditional risk mitigation measures to cope with various risks in agriculture. Some of these practices include:

**Crop diversification:** Farmers often grow multiple crops on their land to spread the risk of crop failure. This helps them to maintain a stable income even if one crop fails.

**Intercropping:** Intercropping is the practice of growing two or more crops together in the same field. This helps to spread the risk of crop failure and provides a more diverse source of food and income for farmers.

**Seed preservation:** Farmers preserve seeds of traditional crop varieties that are well-adapted to local climatic conditions and have higher resilience to pests and diseases. These seeds are then used to grow crops in subsequent seasons.

**Water harvesting:** Farmers have developed traditional techniques such as building check dams, contour bunding, and constructing farm ponds to harvest rainwater and recharge groundwater. This helps to ensure adequate water availability for their crops during dry spells.

**Community-based systems:** Farmers often have established community-based systems for sharing resources, such as water, seeds, and tools. This helps to ensure that everyone has access to essential resources, particularly during times of distress.

**Livestock rearing:** Many farmers rear livestock such as cows, goats, and chickens, which provide a diversified source of income and food. Livestock can also help to provide organic fertilizer for crops and contribute to soil conservation.

These traditional practices have helped farmers to cope with risk for generations. However, with commercialisation of agriculture, changing climatic conditions and increasing demand for food, there is a need to integrate these practices with modern technologies and innovations to make agriculture more sustainable and resilient to risks. Governments and other organizations can also provide support to farmers to promote these practices and to help them adapt to changing circumstances of these crop insurance is an important scheme of government of India. Crop insurance is a risk management tool designed to protect farmers against crop losses due to natural calamities, pests and diseases, and other yield-reducing factors. In India, the Pradhan Mantri Fasal Bima Yojana (PMFBY) is the flagship crop insurance scheme launched by the government in 2016.

Despite the implementation of crop insurance schemes, agrarian distress continues to be a major issue in India. The reasons for this include low coverage of farmers under crop insurance, delayed payment of claims, lack of awareness among farmers about the benefits of crop insurance, and the non-inclusion of several crops and regions under the scheme. Moreover, crop insurance cannot completely alleviate the distress faced by farmers, as it only compensates them for crop losses and does not address the underlying issues of low productivity, lack of access to credit, and inadequate marketing infrastructure. To address agrarian distress, it is important to take a holistic approach that includes improving access to irrigation facilities, promoting scientific farming practices, providing timely credit and marketing support, and ensuring fair prices for agricultural produce. Additionally, efforts should be made to increase awareness about crop insurance among farmers and to make the scheme more inclusive and farmer-friendly.

In conclusion, drylands have great potential for supporting sustainable development and promoting human well-being if managed in a holistic and integrated manner. By leveraging their natural resources and preserving their ecological functions, we can ensure a prosperous and resilient future for dryland communities and ecosystems.

### *Main Research Findings*

The agricultural sector in India faces many challenges, such as rising demands, uncertainties regarding climatic changes, and natural disasters. Hence, updated information is essential to efficiently cope with climate-related risks and reduce agricultural distress (Kantamaneni et al., 2020; Ghose, 2018). Accordingly, the current study measured the agricultural distress of a particular study area by developing the FDI. The results revealed that agricultural distress varies across the locations. One important finding was that within each district, sub-district areas had different FDI scores; hence, from a policy point of view, using the FDI at the sub-district level as a prioritization and planning tool is essential to target the causes of farmers' distress (Gulati et al., 2018) as this will help stakeholders to address the identified deficiencies and evolve measures to tackle them (Simane, 2011). The FDI was relatively uneven across the sites, and accordingly, distress mapping was performed. Overall, we found that climate crisis conditions negatively affect the farmers' economic resources and lead to a profound disruption of social life within this community.

### *Policy Implications*

The study results have implications for several policy areas in terms of tackling agricultural distress and preparing farmers to cope with the risks from exposure to climate change. Since India faces severe uncertainties in climatic changes, the small and marginal farmers have become extremely vulnerable. Therefore, considering these issues, the following policy recommendations are proposed. Firstly, social protection measures building on traditional risk diffusion measures should be proposed to improve the adaptive capacity of farmers. Secondly, policies that promote better access to crop insurance, weather-suitable crop variety, increasing awareness on water harvesting and conservation, and better access to weather information can play an essential role in increasing farmers' resilience. Finally, although the Indian government has allocated more resources to agriculture and several programs were initiated to improve the agricultural sector, agrarian distress is silently spreading across all the states. It seems that all these programs and schemes are disjointed and function independently of each other. Therefore, agrarian challenges and various ongoing programs should be brought together under one umbrella. This policy should cover the major issues such as increasing income, generating employment opportunities, reducing agrarian risks, developing agri-infrastructure, and improving the quality of rural life.

### *Research Challenges and Future Work*

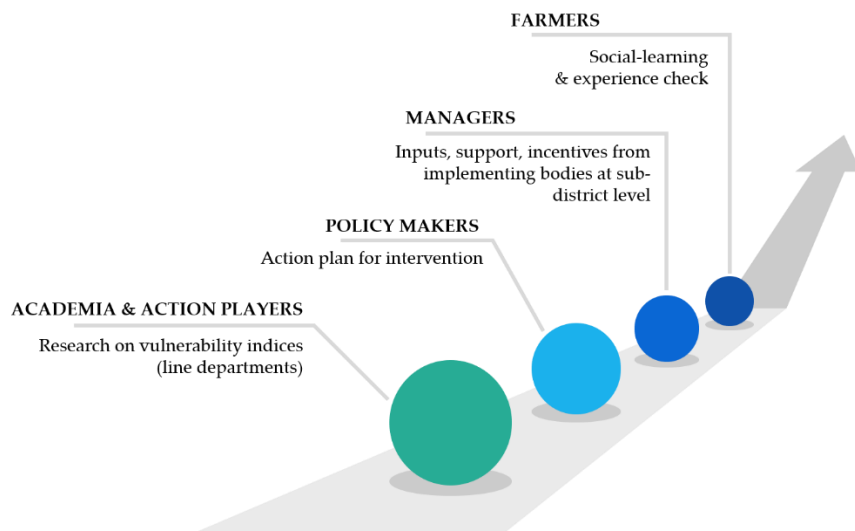
Although the present study has produced some significant and interesting results, there are certain research limitations and challenges. Due to the COVID-19 pandemic, the availability of consistent government data was affected, and it was time-consuming to conduct the field surveys in the villages and compile and finalize the data sets (Cattivelli and Rusciano, 2020). Likewise, due to the limited fieldwork time, the research could not be extended to more areas. In the era of climate change and post-liberalization, agricultural vulnerability and farmers' distress concern the entire society, including farmers, communities, policymakers, and researchers. Although several studies have focused on climate change dimensions and their resultant impacts on farmers' distress, a comprehensive and composite set of indicators representing all dimensions with great importance in farmers' distress that can be used as a policy tool is not appropriately addressed in the literature.

The study results have implications for several policy areas concerning agricultural distress and for preparing farmers and local administrations to cope with hazards through prioritization and planning at the sub-district (*mandal/block*) level. Although the selected 50 indicators in the seven dimensions are sufficient to diagnose the extent and duration of farmers' distress, combining the FDI with the latest satellite images will help to

further enhance the accuracy and utility of the FDI to allow timely actions to be taken before the realization of extreme distress. They can be obtained through remote sensing technology with minimal reliance on human intervention. It can also provide additional real-time data on many indicators such as soil moisture, temperature changes, biotic stresses such as the extent of pests and disease outbreaks, and yield assessment with more accuracy.

This improved FDI may be used to develop comprehensive agricultural insurance schemes, which have the potential to replace single-dimensional crop-specific insurance products, as insurance is one of the main policy instruments for reducing multidimensional farmers' distress (Gulati et al., 2018). The FDI offers a framework to evaluate and understand vulnerability at the farmer level. The FDI captures all aspects of farmers' livelihoods and vulnerabilities, including exposure to risk, sensitivity, adaptive capacity, mitigation and adaptation strategies, triggers, socio-psychological aspects, and impacts. Given that all aspects are covered with 50 simple indicators in seven dimensions, data can be collected from a representative sample of farmers from each sub-district (*mandal*) in identified vulnerable districts every year and based on the index, highly distressed *mandals* can be identified and targeted for future policy intervention. The FDI tool can also work as an instrument to develop local community-driven climate resilience strategies through comprehensive bottom-up planning platforms, such as "Climate Innovation Platforms", that can be established in vulnerable districts throughout the country (Simane, 2011). This analysis can also be usefully applied to study vulnerability patterns across other tropical regions of the world from a comparative perspective.

The FDI is the first step in developing a package of location-specific distress management approaches with periodical monitoring at every level to reduce farmers' distress. The process involves extensive knowledge transfer by the researchers to the policymakers to create a successful action plan for intervention through various organizations to provide various supports, inputs, and incentives (Figure 17.1).



**Figure 17.1.** Diagrammatic representation of distress management package in agriculture.

To properly implement the above package, developing a precise action plan with a separate budget allocation and an implementing agency is essential. We also emphasize the need to identify the bodies responsible for implementing the intervention plan, targeting each indicator at the sub-district level.

**Table 17.1.** Action plan of distress management package (an example).

<b>Examples of Distress Indicators</b>	<i>List of blocks</i>	<b>Area of Intervention</b>	<b>Action Plan for Intervention</b>	<b>Responsible Bodies</b>
Lack of non-farm employment		Strengthening and training of small enterprises	Encouragement of women/youth in engaging in cottage industry with farm waste materials	NGOs and skill development council
High indebtedness		Credit support	Easy and smooth access of formal credit institution	Formal credit institutions (banks, cooperatives)
Low agricultural land landholding		Mapping of local resources and their management, development of land-lease markets	Adoption of integrated farming system, credit facilities to tenant farming	Local bodies Banks
Low % irrigated area (lack of irrigation)		Watershed development	Practice of water harvesting and conservation	Local bodies Community
Low educational status		Capacity building	Provision of extension services and special training to farmers	Extension agencies Research institutions NGOs, SHG
Crop failure		Promotion of involvement in the mitigation program	Awareness of crop insurance schemes Identification of drought-prone areas Selection of proper crop varieties	Local-, state-, and national-level government bodies Insurance companies

Additionally, this paper also provides a conceptual model of the Distress Management Package at the sub-district level to develop a network between various players and develop a location-specific action plan to mitigate agricultural distress (Raju, et al., 2016; (Timilsina et al., 2020; Cariappa et al., 2021; Cattivelli et al., 2020; Rusciano et al., 2020; Rusciano et al., 2017). The FDI can be used as a policy tool, especially in states with highly recurrent farmer distress such as Maharashtra, Telangana, Karnataka, and Rajasthan, with regular field surveys conducted using the identified 50 variables for farmers to construct a sub-district-level FDI and to categorize and prioritize action points by the government and the local community to reduce farmers' distress. This can trigger virtuous social innovation and represents a new frontier of sustainable and resilient development through an effective communication system to reduce agrarian distress.



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