

KHARIF 2025-26



FARMERS' REFLECTIONS ON LIVELIHOOD SUSTAINABILITY

An analysis of farmers' reflections on the livelihood sustainability performance of prevailing monocropping, mixed cropping, and Hangadi within climate change-induced weather variability during Kharif 2025



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PREFACE

Samvad is the foundation for the cocreation of knowledge and rejuvenation of rich traditional practices, be they related to social, economic, cultural, ecological, educational, or livelihood-linked topics. Therefore, VAAGDHARA has adopted it as a key ingredient in its recipe of change, or, say, theory of change. Almost all our studies are designed and performed using the approach of Samudayik Samvad (Community Dialogue).

In Vagad regions, during July–August 2025, when farming has shown high variations from non-cultivated to monocropping to mixed to Hangadi. The year saw extreme weather variability all through the Kharif season. Thus, VAAGDHARA undertook a process of continued dialogue and looked for community reactions, reflections, and responses to these weather changes.

This Samvad (study–dialogue) process brought out various aspects of farming and compiled them in the form of a document, i.e., “An Analysis of Farmers’ Reflection on Livelihood Sustainability Performance of Prevailing Monocropping, Mixed–Cropping, and Hangadi within Climate Change–Induced Weather Variability during Kharif 2025.” It included group–based dialogues to explore the relationship between the indigenous community and the performance of five models of farming systems commonly followed at the junction of Gujarat, Madhya Pradesh, and Rajasthan. It also reviews their approach from the lens of sovereignty for sustainability, which is at the core of each and every action of VAAGDHARA and its community.

The study is rooted in the shared living of the community and their immediate surroundings, their reflections, and their potential for future trends to face variabilities that are caused by changing climate and socio–economic situations. I understand this study strengthens our belief in traditional indigenous systems, more so for farming systems. It will help further us for intensifying our efforts to yield more sustained benefits for underprivileged indigenous communities and society as a whole.

I extend my heartfelt gratitude to both the community who shared their experiences and members of Swaraj Sangathan and team members of VAAGDHARA who joined together to make it possible.

Jayesh Joshi
Secretary
VAAGDHARA





FORWARD

This action research was undertaken to systematically document the attitudes, perceptions, and lived experiences of farmers regarding climate change and climate variability, particularly in relation to their critical farm operations across different cropping systems. The study examined monoculture farming (maize, cotton, and soybean), mixed cropping systems (two to four crops), and Hangadi farming (cultivation of more than five food crops), which are central to sustaining agricultural productivity and livelihoods in the tribal tri-junction of Rajasthan, Madhya Pradesh, and Gujarat, where VAAGDHARA works.

The need for this study emerged from growing concerns among farmer support groups and community organizations about the visible impacts of climate change on agricultural sustainability. Farmers have been experiencing irregular rainfall, temperature fluctuations, and changing seasonal patterns that directly affect crop productivity, income stability, and food security. Recognizing these emerging risks, a systematically designed action research process was initiated to generate evidence grounded in farmers' real experiences.

The study adopted Focus Group Discussions (FGDs) as the primary data collection method, enabling farmers from different villages to express their opinions in a structured and participatory manner. Data collection was conducted in two stages. In the first stage, villages were shortlisted from a broad base of 208 villages within VAAGDHARA's operational area, based on predefined criteria such as vulnerability to climate variability, dependence on agriculture, and representation of diverse cropping systems. In the second stage, FGDs were conducted during the Kharif season, a period when farmers are most exposed to rainfall variability and temperature-related risks.

A well-structured questionnaire was developed to guide discussions and capture changes across key parameters, including rainfall patterns, temperature fluctuations, cropping systems, agricultural productivity, and livelihood sustainability. Pre-defined response categories ensured comparability across groups and enabled partial quantification of qualitative insights gathered through discussions. This structured approach enhanced the reliability and analytical strength of the findings.

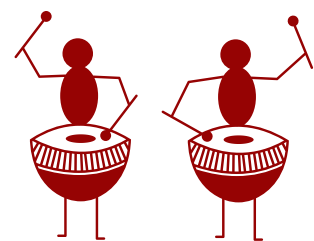
In total, responses from 626 farmers across 26 KASS community-representing villages were documented, compiled, and analyzed using tabular and graphical methods. The analysis helped identify trends, patterns, and shared challenges faced by farming communities across the study area.

This report presents the findings in a structured and analytical manner, offering grounded evidence on how changing climatic conditions are influencing cropping systems and livelihood sustainability among tribal farmers. The insights generated through this action research are expected to inform future program planning and guide the design of interventions aimed at strengthening resilience and promoting sustainable farming systems in the region.

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An analysis of farmers' reflections on the livelihood sustainability performance of prevailing monocropping, mixed cropping, and Hangadi within climate change-induced weather variability during Kharif 2025.

Abstract:

Even after a good start to the rains, the tribal junction of Gujarat, Madhya Pradesh, and Rajasthan saw many farms remain uncultivated. Initial inquiry indicated excessive rains and prevailing patterns have forced farmers to remain idle. Therefore, VAAGDHARA planned to work with farmer groups and undertake action research around the key research question, "Does climate change have an impact on the nutrition, income, and livelihood of small and marginal indigenous farmers?" In a quick phase I, 208 villages were assessed to identify one sample village each in 26 KASS.

Phase-II FGD and group interviews were carried out in 26 villages involving 620 farmers (300 women and 320 men) following five prevailing farming systems, i.e., monocropping of soybean, cotton, and maize; conventional mixed farming; and traditional Hangadi. One by one farmers assessed these systems on the aspects of land preparation, sowing, germination, early growth, input cost, production, diseases and pest infestation, production, diet and nutrition, risk, vulnerability, and market dependence. Farmers reflections were observed and discussed on comparative aspects. When clubbed together, the results indicated a need to adopt diversified farming, including Hangadi and mixed ones, as they performed better to secure food, nutrition, reduced cost, climate resilience, and resulting livelihood stability. Though soybean and maize monocrop still preferred may bring higher income, but in balanced weather conditions. The monocropping system exposes farmers to greater risk in bad years, pushing them into debt, food insecurity, and livelihood stress. The study can conclude that farmer groups indicated a need for action-research on the inclusion of cash crops like soybean, cotton, groundnut, maize, etc. as components of Hangadi and mixed-system.

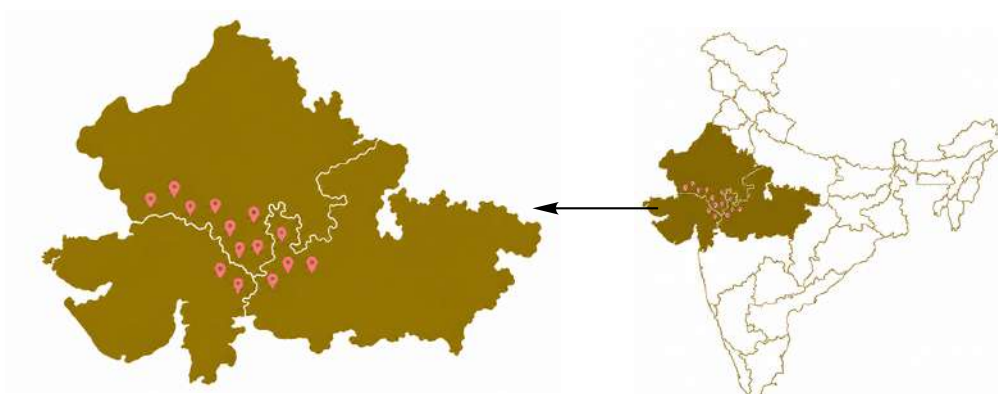




1. Context and Research Question

Vaagdhara's working area is predominantly inhabited by tribal communities (over 70%), with agriculture serving as the primary occupation for food security and livelihood. Cropping systems in this region are traditionally based on integrated mixed and multiple cropping, adapted to undulating rainfed lands. Tribal families, of the small and marginal farming category, cultivate limited parcels of uneven terrain where they grow diverse crops to meet household dietary and nutritional needs. These farms also serve as living spaces shared with family members and livestock in a co-existing manner.

Maize is the principal crop in the tribal cropping system, traditionally intercropped with pigeon pea, black gram, cowpea, green gram, groundnut, sesame, soybean, paddy, and cotton on the same plot of land. Seasonal vegetables such as okra, beans, and cucurbits (pumpkin, ridge gourd, sponge gourd, bottle gourd, bitter gourd, etc.) are integrated as intercrops or border crops. Fruit plants like papaya, lemon, and banana are commonly planted in backyards or along farm boundaries, adding perennial diversity.



This unorganized yet sustainable cropping system is widely practiced across the tribal belt of this trijunction area located in the extreme south of Rajasthan, and it is bordered by Gujarat to the southwest and Madhya Pradesh to the southeast of southern Rajasthan, Gujarat, and Madhya Pradesh. The agro-climatic of the area is marked by heavy rainfall with erratic monsoon patterns. Given limited landholdings and rainfall uncertainty, mixed cropping is the dominant practice. This system reduces the risk of crop failure while ensuring diverse food availability, nutritional supply, organic inputs, and livelihood support. It is predominantly inhabited by Scheduled Tribes with poor socio-economic conditions. The zone is characterized by rainfed agriculture, small landholdings, undulating terrain, and unusually high winter temperatures.

Agriculture remains the primary source of livelihood, and cropping systems are designed to maximize food, nutrition, and risk management for these communities.

1.1 Cropping Systems and Integrated Farming:

Limited landholding capacity and dependence on agriculture make it essential for tribal farmers to utilize available resources like land, forests, water, seeds, and livestock in an integrated manner. Cropping systems here combine cereals, pulses, oilseeds, vegetables, fruits, and fodder crops, ensuring household food security and nutritional diversity. Livestock integration provides manure and organic inputs, reinforcing sustainability.

This system meets multiple objectives of food and nutrition security, employment, daily income, and ecological balance. Though practiced in an unorganized manner, tribal cropping systems serve as a resilient livelihood strategy.

India's rural economy is heavily dependent on agriculture, but declining landholdings pose serious challenges. Integrated cropping systems open opportunities for small and marginal farmers to generate income and employment year-round (Mahapatra, 1994). They also address critical concerns such as soil fertility, biodiversity conservation, and ecological balance. By ensuring food quality, nutritional adequacy, and livelihood security, cropping systems in tribal Rajasthan exemplify a holistic and sustainable approach, delivering long-term benefits to both communities and the environment.

1.2 Climatic conditions and annual rainfall

This zone of southern Rajasthan has typical subtropical subhumid to humid climatic conditions characterized by mild winters and moderate summers with high relative humidity during the months of July to September. The annual rainfall of this zone varies from place to place, with an average of 889.57 mm received in 43.0 rainy days (as per the data of ARS, Banswara, from 1997 to 2025). Raising of agricultural crops often suffers either from delayed onset of monsoon or mid-season droughts or terminal drought at flowering, which is a very damaging phenomenon in the zone. Because of this, the crop dependency on rainfall water and yield realization is also fluctuating. The mean annual potential evapotranspiration varies from 1301 to 1400 mm.

The zone lies in the belt having the mean monthly maximum temperature ranging from 11°C in January to 26°C in June. Likewise, the mean monthly maximum temperature ranges from 21.8°C in January to 43.8°C in May, which sometimes goes up to 46.0°C. The 2025 weekly average rainfall data of Banswara clearly indicates heavy rain with the commencing of monsoon and also observed a higher number of rainy days (53 days) compared to the average rainy days of 43 days, which clearly indicates climatic variations.

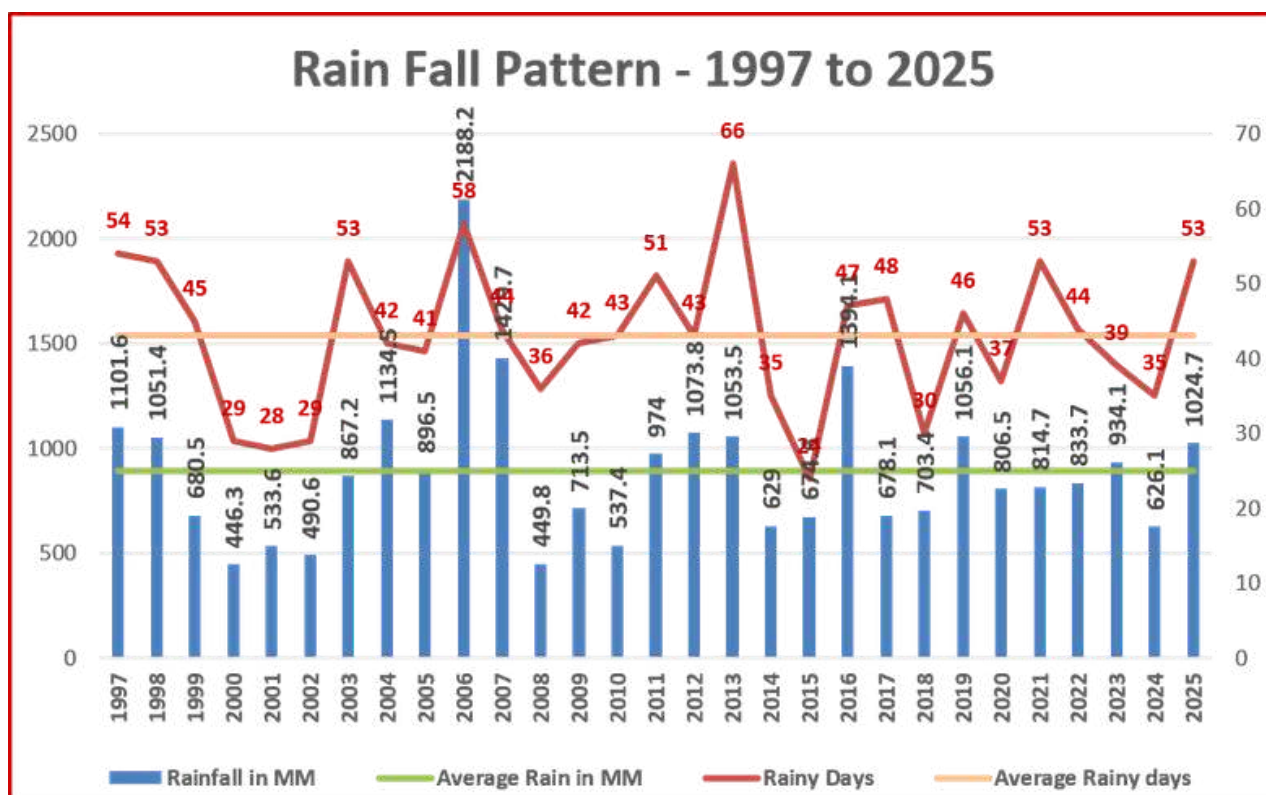


Figure 1 Number of rainydays since 1997 to 2025

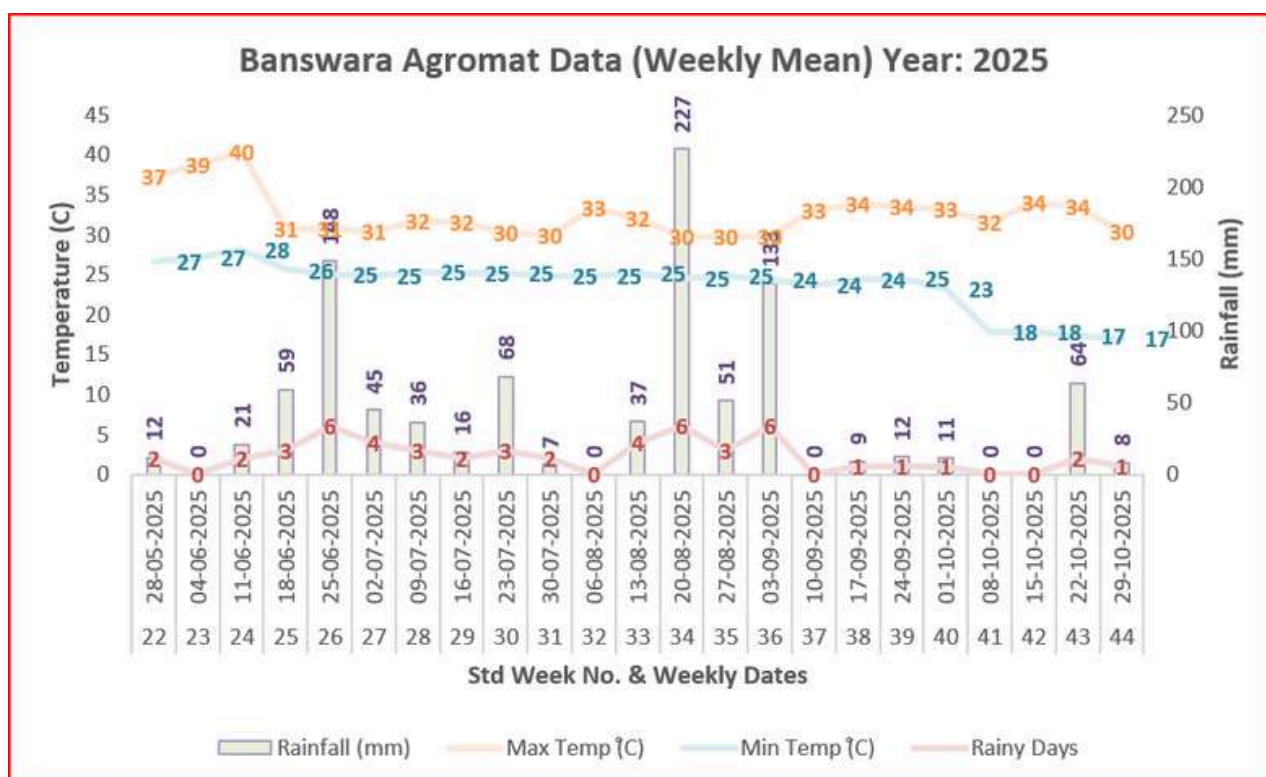


Figure 2 Weekly precipitation in MM during rainy season 2025

Need to conduct action research on farming systems

Moving around the field area, the VAAGDHARA team experiences that ever after having good rains, many farms are uncultivated or remain unused. Initial inquiry about this situation indicated that the present rainfall pattern has caused many farmers to leave kharif cultivation due to heavy and continued precipitation. Discussion with KASS members (Krishi evm Adivasi Swaraj Sangathan, a unit of 20–30 villages formulated to represent community voice representing that particular unit) indicated that, like the majority of the last decade, the year 2025 is also having high-level weather variabilities in terms of uncertainties such as temperature, wind blowing, precipitation pattern, and sunlight. Some of these manifestations of climate change in the tribal junction of the three states Gujarat, Madhya Pradesh, and Rajasthan, the operational area of VAAGDHARA, are as given below:

- ◆ May and June have seen temperatures lower than average.
- ◆ The month of May has frequent showers.
- ◆ Delayed onset of monsoon
- ◆ Continued and heavy downpour of rains
- ◆ Continued cloudiness with no sunlight for weeks
- ◆ Sudden rise/drop of temperature during 24 hours.

These weather situations have already started influencing farmers' decisions in farming practices and outcomes thereof. These are the decisions pertaining to farming pattern, crop selection, sowing pattern, and day-to-day practices. They have already started impacting normal anticipated crop performances such as vegetative growth, occurrence of diseases, pest infestations, etc. Altogether these will result in terms of productions, nutrition security, income, and overall livelihoods of indigenous farmers in the area, more so small and marginal farm-holders with limited resources.

Therefore, the technical support unit of VAAGDHARA proposes to undertake action research involving active farmer groups across its operational area. The key research question for this research is "Do climate change have an impact on the nutrition, income, and livelihood of small and marginal indigenous farmers based on the adoption of specific farming patterns prevailing in the trijunction area?"

Objectives: The action research is proposed with the following specific objectives.

- ◆ To capture farmer's response to climate change-induced weather variability being manifested in the area.
- ◆ To identify variations in crop performances under different cropping patterns of monocropping, mixed cropping, and Hangadi practice.
- ◆ Bring out comparative outcomes (production quality and quantity) of major crops within different cropping patterns.

Analyze the performance of three cropping patterns in terms of nutrition, income and overall livelihood sustainability for small and marginal indigenous farmers at the face of climate change.



2. Research Methodology



In the tri-junction area of this tribal region of central-western India, farmers mostly have three choices, namely monocropping of different crops, mixed farming of a few combinations, and indigenous practices of Hangadi kheti. With these three combinations, one takes up different crops following different approaches. These three cropping patterns respond to specific weather conditions differently, thus resulting in differences in terms of production quantity and quality. This disparity in kharif season outcomes raises critical questions about the sustainability and adaptability of either practice. As per the present interaction with the lead-tribal farmers, the most common practices related to major crop are given below.

- a) Monocropping of Cotton
- b) Monocropping of Maize
- c) Monocropping of Soybeans
- d) Mixed of two or more (cotton/maize/soybean/pigeon-pea)
- e) Hangadi Kheti (a combination of more than five food group crops)

3. Sample villages

3.1 Phase 1: Identification of study village for participation in study

To identify the most suitable location/villages to organize FGD, where almost all the above cropping practices were followed along with where the farmer fields remain uncultivated or crop failure was observed due to any reason, a survey was conducted. A survey proforma with the purpose and methodology for digital data capturing on farmers' responses to the situation of sowing and germination in the village was prepared (Appendix-1). This proforma has seven objective-based questions to assess the real field and farming situations. The above survey was conducted in all the KASS (Krishi Evam Adivasi Swaraj Sangathan) working in all Vaagdhara working locations in all three states. In this way, this survey was conducted in a total of 208 villages, and 26 village locations distributed across all 26 KASS Vaagdhara working areas (in tri-junction adjoining 3 states) were selected for conducting phase 2 (Appendix-2). These selected villages were fulfilling all the norms, viz., having all the cropping systems, failure of crops due to any climatic reasons, etc., for conducting phase 2 of FGD, which was conducted (Table-1) during October and November, 2025.

3.2 Phase-2 Methodology

This study was conducted employing Focus Group Discussions (FGDs) as a participatory tool to capture farmer experiences, perceptions, and indigenous knowledge in adopting different cropping patterns to critically diagnose fundamental agronomic and socio-economic challenges in following these practices.



Table 1-Study Execution

Unit Name	KASS Name	FGD Place	FGD Date	Total Participants	No. of Male Participants	No. of Female Participants
Hiran	Bhagatpura	Bhimpur	14/10/2025	23	6	17
Hiran	Bhilkuan	Godawara Nareng	18/10/2025	25	12	13
Hiran	Potliya	Thummath	29/10/2025	26	14	11
Hiran	Bhilkuan	Dugripada	30/10/2025	26	12	14
Hiran	Timeda	Kotra	31/10/2025	26	18	8
Mahi	Ghatol	Salaria	15/10/2025	23	10	13
Mahi	Ganoda	Madanpura	16/10/2025	23	17	6
Mahi	Chanduji ka Gada	Timbagamdi	17/10/2025	20	7	13
Mahi	Chanduji ka Gada	Shankarpura Senawasa	28/10/2025	25	15	10
Mahi	Piplakhoont	Tamtiya	29/10/2025	28	10	18
Mahi	Piplakhoont	Kalighati	27/10/2025	25	12	13
Mahi	Khamera	Roop Ji Ka Kheda	18/10/2025	21	9	12
Mahi	Bhungda	Delia Talab	17/11/2025	26	14	12
Mahi	Bhungda	Miysa	17/10/2025	26	16	10
Mahi	Sabla	Myala	15/10/2025	25	15	10
Mahi	Aspur	Rama Dhani	15/11/2025	25	16	9
Mahi MP	Thandla	Daulatpura	16/10/2025	25	7	18
Mahi MP	Sailana	Mahudipada	17/10/2025	28	11	17
Mahi MP	Mataji	Ratangarh Peeth	27/10/2025	25	14	11
Mahi MP	Bajna	Bhadan Khurd	27/11/2025	25	6	19
Mangadh	Gangadtalai-1	Jagpura	16/10/2025	24	17	7
Mangadh	Jhalod	Thuthi Kankasia	14/10/2025	21	9	12
Mangadh	Gangadtalai-1	Ratan Tori	17/10/2025	16	7	9
Mangadh	Fatehpura	Madhava	15/10/2025	19	11	8
Mangadh	Anandpuri	Khandora	14/10/2025	25	9	11
Mangadh	Anandpuri	Mundri	6/11/2025	25	6	19

4. Observations

Sections give item-wide observations from different FGDs undertaken during the action research program and developed based on data as shown in Annex-01

4.1 Weather and climate change

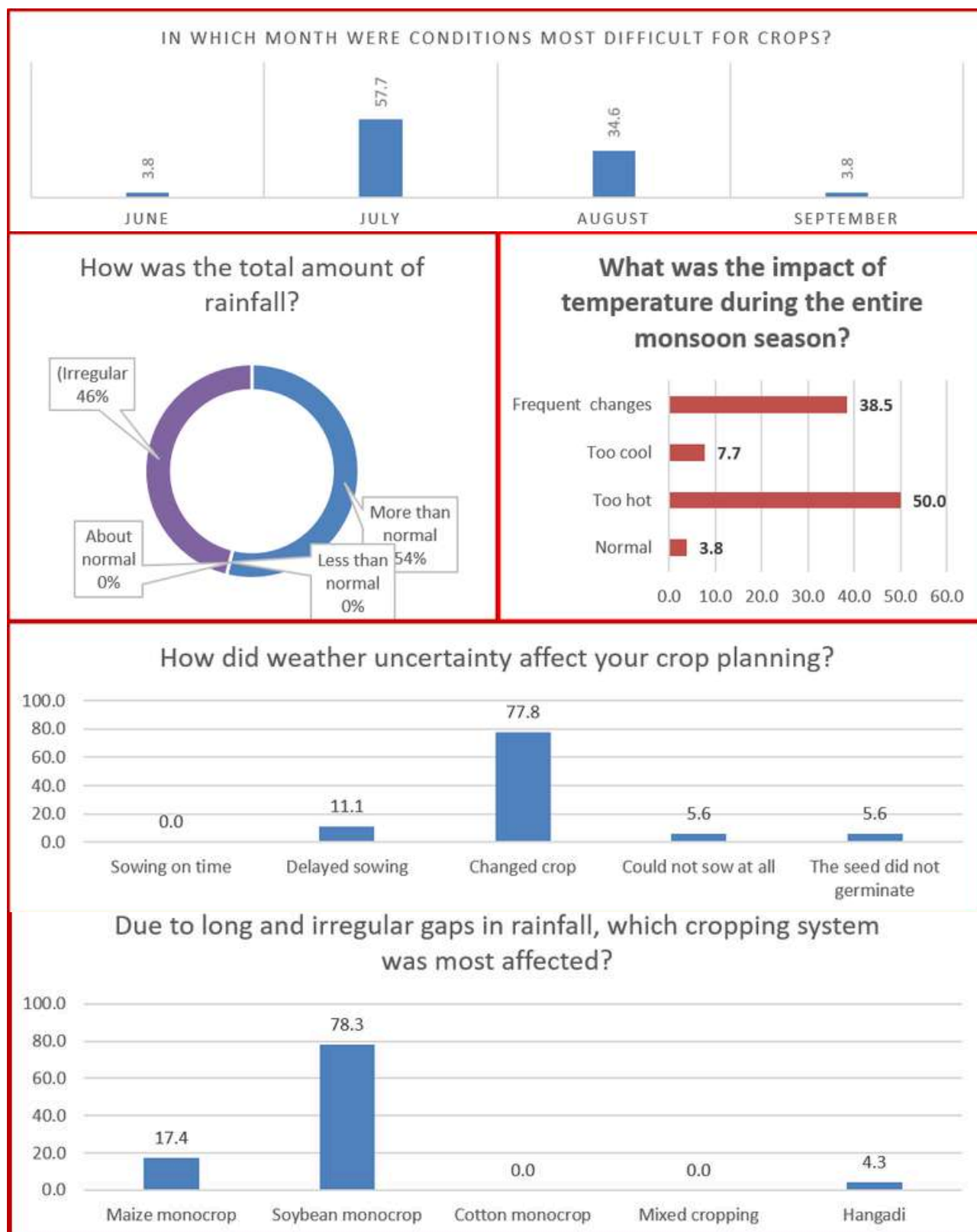


Figure 3- Weather related graphs

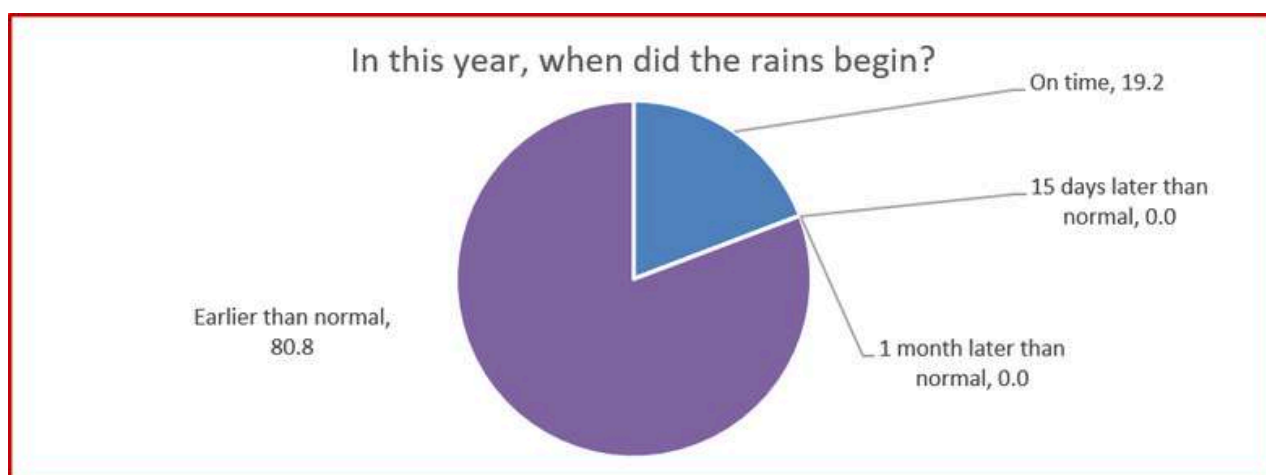


Figure 4 Farmer's reflections about the onset of rains (2025)

- ◆ The majority of farmers (81%) reflected that in 2025 rains started earlier than anticipated time.
- ◆ Fifty-four percent of farmers indicated that rainfall was excessive, but 46% indicated it was irregular.
- ◆ Many farmers (50%) felt that the season was too hot, while many a farmer (38%) said the temperature kept changing again and again.
- ◆ A large number of FGD participating farmers (50%) said that entire crops were damaged because of strong winds and storms. Others said (46%) that crops fell down (lodged) due to heavy rain and wind.
- ◆ Most farmers (58%) said that July was the most difficult month, followed by August. This is the critical period for plant establishment since crop plants are young and sensitive to any environmental changes.
- ◆ A very large number of farmers (78%) said they had to change their crops because of uncertain weather. Some delayed sowing, and a few (11%) could not sow at all.
- ◆ Across almost all FGD/villages, participating farmers (78%) clearly said that soybean monocropping was the most affected cropping system. Long dry gaps after sowing badly damaged soybean crops.

4.2 Land Preparation and Sowing

In most FGD villages, farmers said that 50–75% of their land could not be sown during Kharif 2025. Because of heavy and untimely rains, many fields remained either too wet or unprepared for sowing. In Madhya Pradesh, the problem was even bigger, where most farmers reported that more than half of their land remained unsown. This situation tells us that climate problems are affecting very initial activities of farming, like land preparation, which ultimately affect sowing/delayed sowings. (Annexure-2)

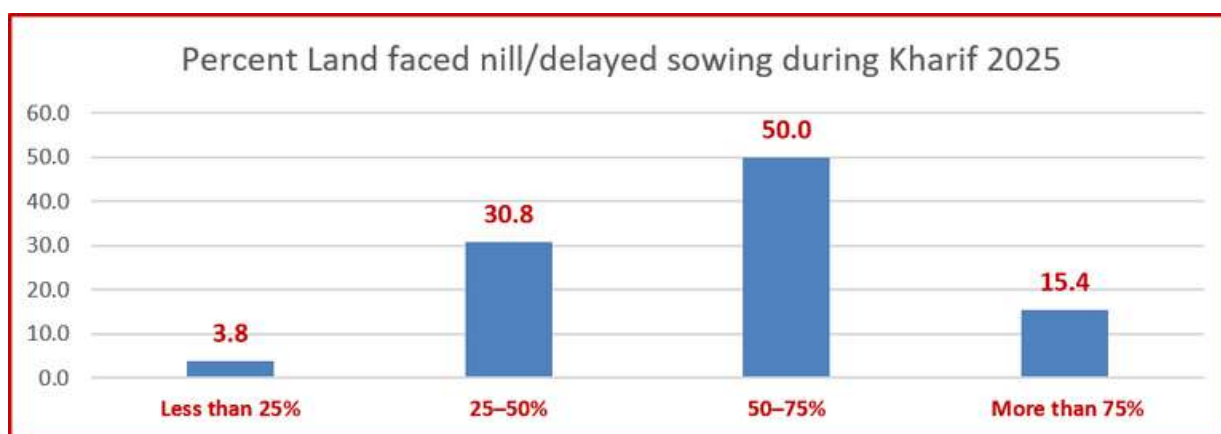


Figure 5 Percent farmers faced percent land with nill/delayed sowing during Kharif 2025

As regards the soil moisture status at the time of sowing, the majority of farmers (88%) said that their fields had excessive moisture at the time of sowing. Almost all villages faced this problem, and some farmers even said their fields were waterlogged. Excessive moisture made land preparation difficult, damaged seeds, and delayed operations.

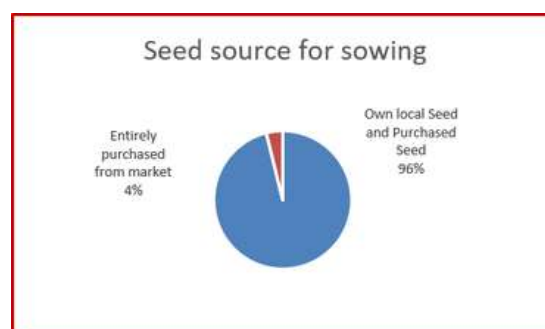


Figure 6 Sowing and Seed source Kharif 2025

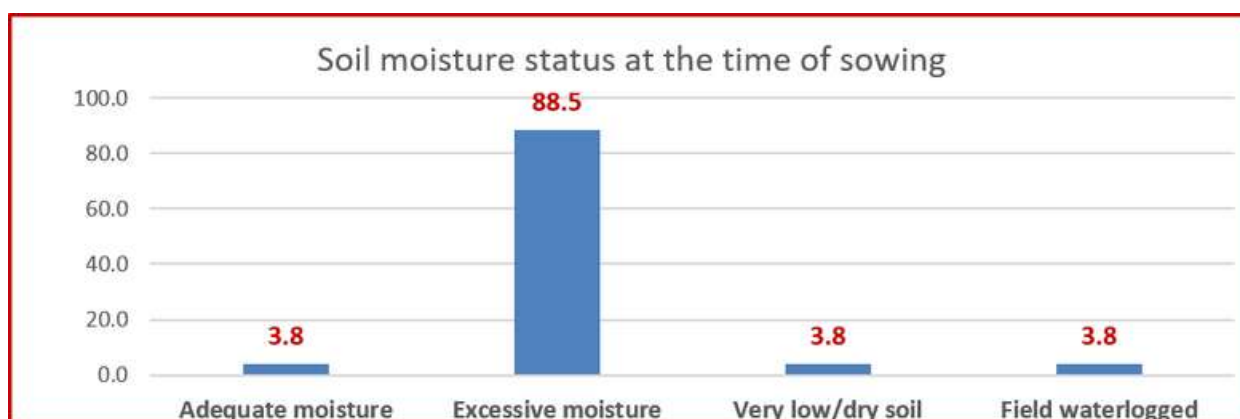


Figure 7 Soil-moisture status observed during the time of sowing (Kharif 2025)

Most farmers (96%) said they used both their own traditional seed and some of them purchased seed from the local market. Very few of the FGD participating farmers fully depended on market seed. FGDs also revealed that many farmers had to undergo resowing in some fields because earlier sown seeds were damaged due to excess rain, which increased seed costs and labor.



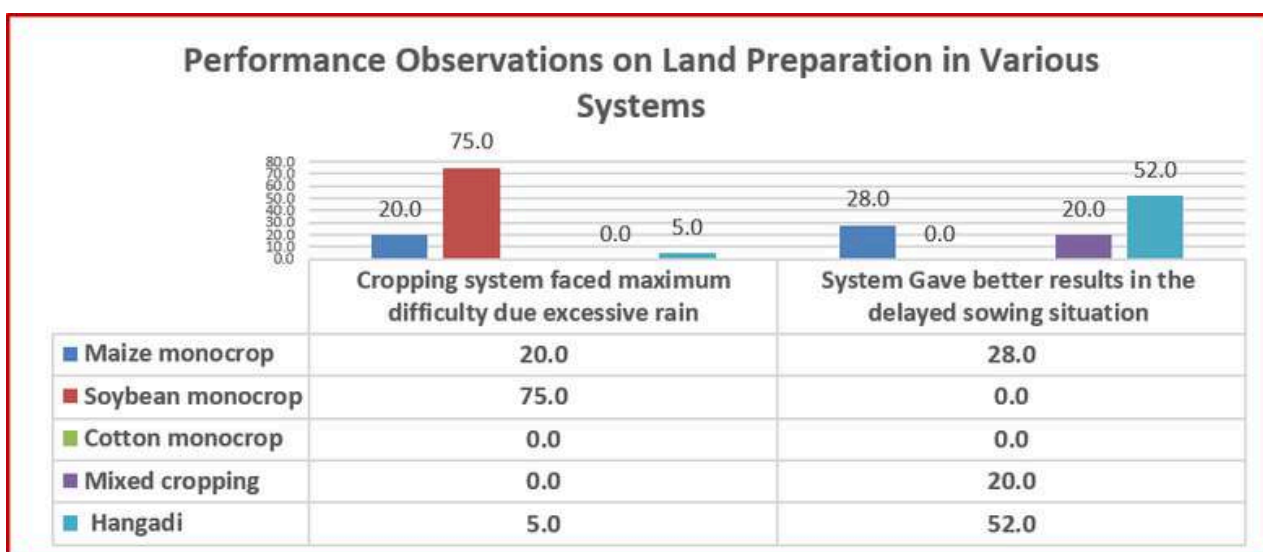


Figure 8 Cropping Systems and problem faced in land-preparation

- In Madhya Pradesh and Rajasthan, every village reported soybean monocrop as the most affected system. FGD farmers explained that soybean is very sensitive to both excess moisture and dry gaps, so when rainfall becomes irregular, the crop fails easily.
- Most farmers (52%) said that Hangadi farming gave the best results when sowing was delayed. In the case when rains were delayed or fields were not ready on time, Hangadi crops adjusted better. Farmers explained that because Hangadi includes many different crops, at least some crops survive even if others fail.

4.3 Cropping pattern

Most farmers (81%) said they followed multiple systems (almost all) in their farming, indicating a reduction in the risk of dependence on one approach, except for 7% following monocropping. Among the farmers who followed monocropping, 50% reported low production, while 27% indicated crop failure, and only 23% indicated average production.

This hints that weather variability due to climate change poses risks to monocropping.

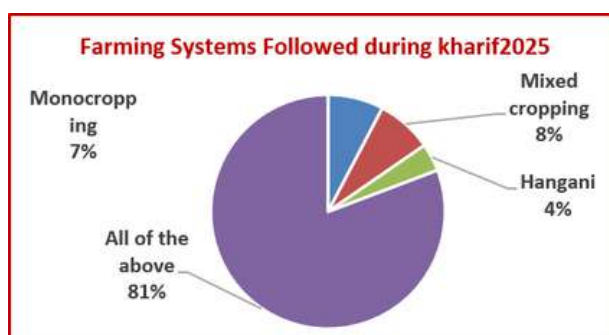


Figure 9 Cropping Systems adopted during Kharif 2025

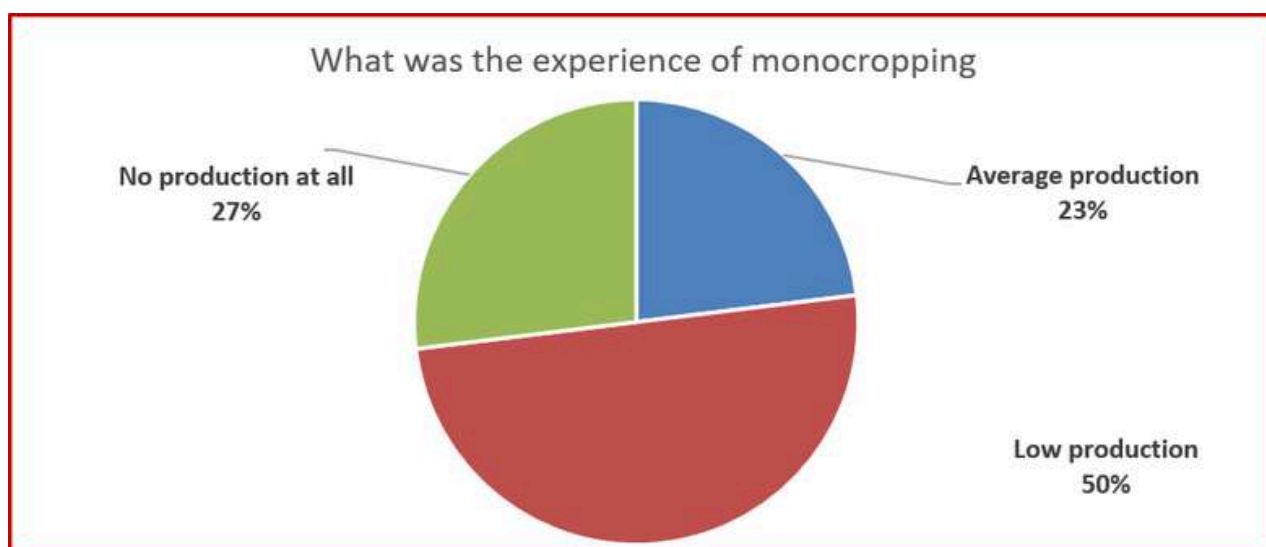


Figure 10 Experiences of Monocropping during Kharif-2025

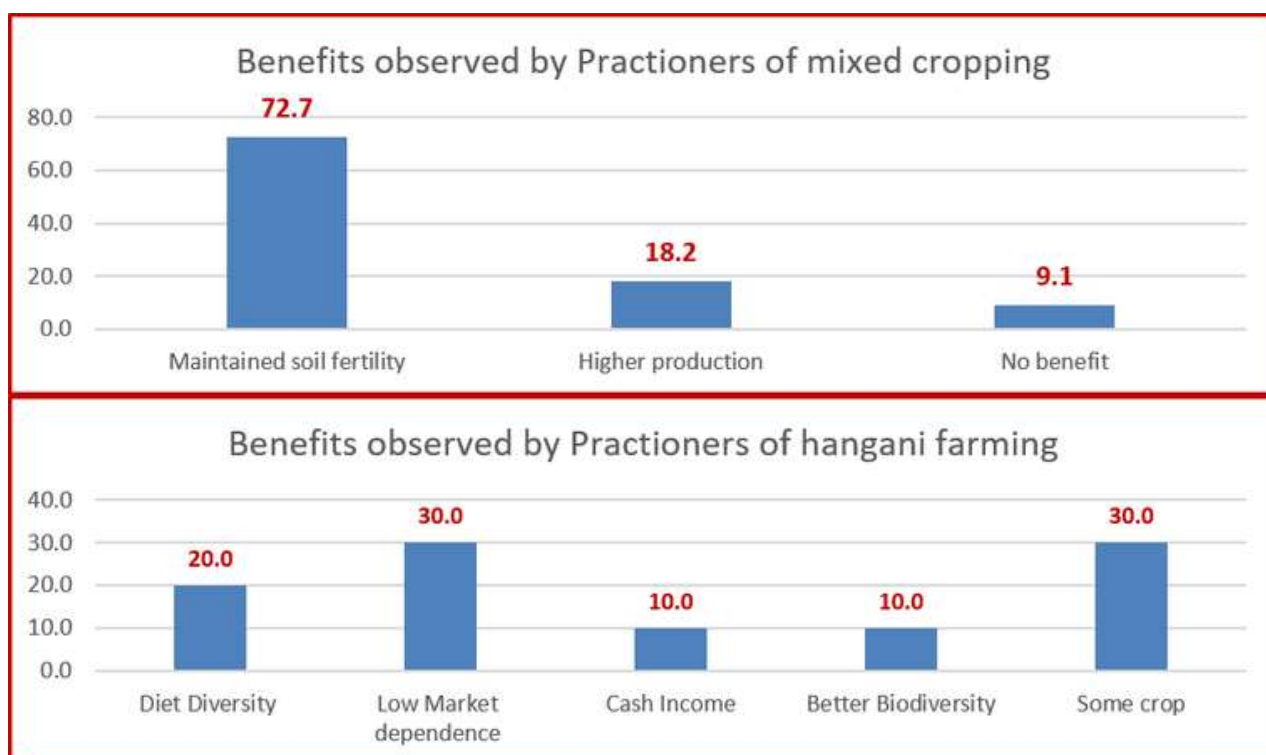


Figure 11 Benefits of Mixed farming and Hangadi as observed by farmers

With regard to the benefits of mixed cropping and the Hangadi system, most farmers (73%) said that mixed cropping helped them maintain soil fertility, and 18% also indicated better production as compared to monocropping. Farmers shared that Hangadi helped in reducing market dependence (30%), improving diversity (10%), and improving diet diversity (20%). A few farmers (10%) also indicated cash income. Some farmers (30%) said that in case of failure of one crop, the other crop produce supported the family, which gave them a sense of security during difficult seasons.

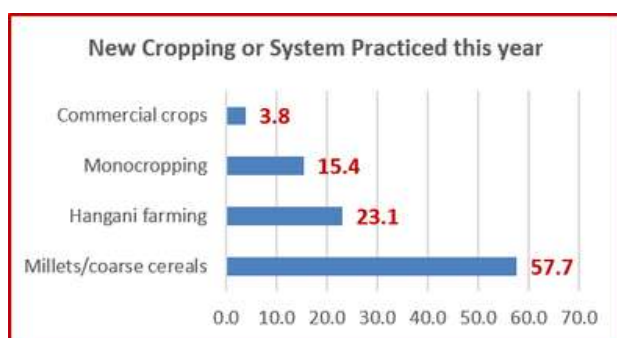


Figure 12 New Crops and Systems adopted during Kharif 2025

Around 58% of farmers (58%) started trying/reintroducing minor millets and coarse cereals along with their regular crops. Some (18%) also started experimenting with Hangadi farming and mixed cropping. This shows that farmers are actively looking for better/nutritional options that can survive in a changing climate

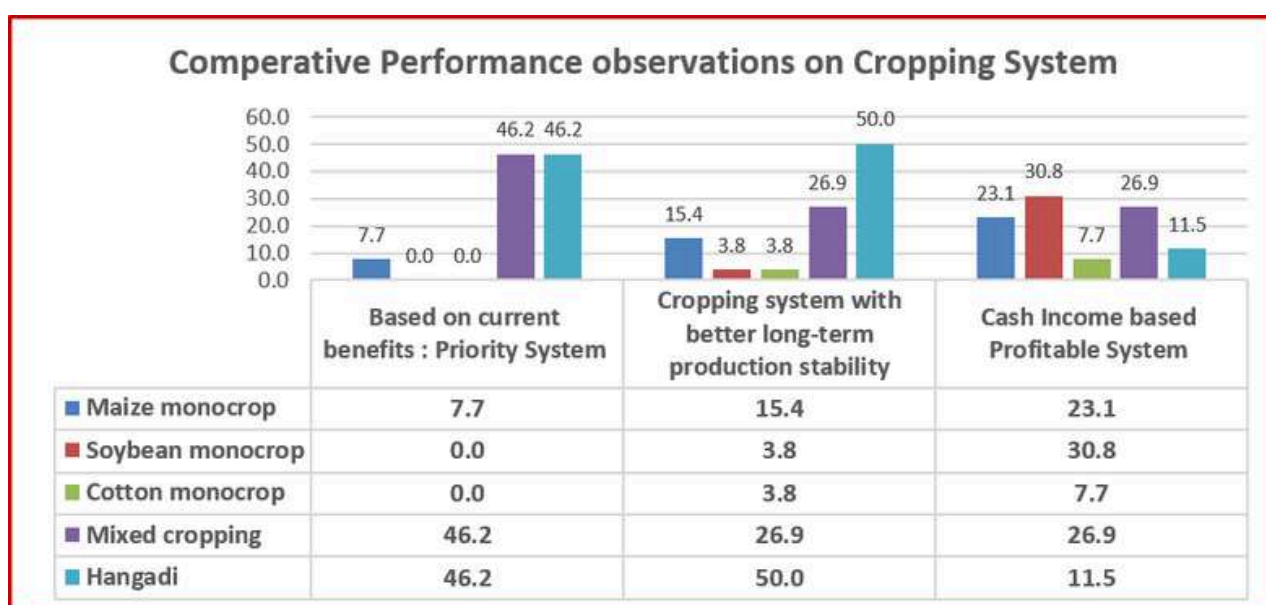


Figure 13 Comparative Performance on Cropping System

Based on current experiences, most farmers indicated a preference for mixed cropping and Hangadi, 46% each, altogether 92.4% of farming in the future. Similarly, on account of long-term production stability, 50% of farmers indicated they strongly felt that Hangadi farming gives the most stable production in the long run. Even when weather changes, some crops always perform well. Mixed cropping came second, while monocropping was seen as unstable and risky in changing climatic conditions. A few farmers (31%) said that soybean monocropping still gives the highest cash income in good years.

However, they also said that this income is uncertain and depends heavily on weather and market prices. On the other hand, mixed cropping and Hangadi farming may not always give high cash returns, but they provide regular food, fodder, and small income, which helps families survive even in bad years. (Data given in Annexure-3)

4.4 Germination and early growth

To capture the situation about the germinations and early growth

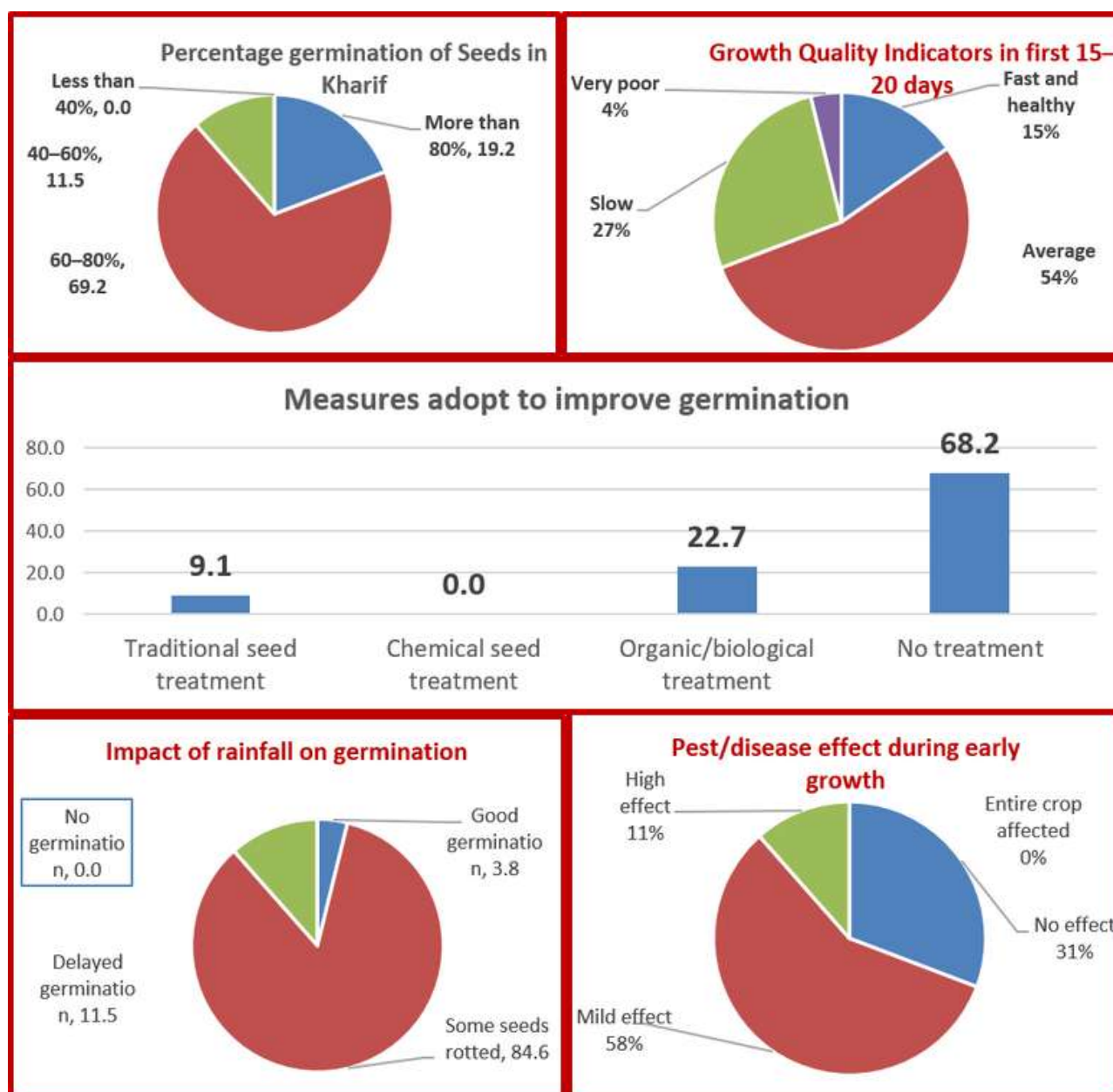


Figure 14: Various aspects related to Germinations

- Majority farmers (69%) indicated that the seed germination rate was 60–80%, while 19% of farmers even report higher germination (>80%).
- The majority of FGDs described early crop growth as average or slow (59%), while in few villages some groups reported fast and healthy growth (15%). Farmers expressed that this situation was mainly due to excessive rains, cloudy weather, and temperature variability.

- Around 85% of farmers shared that low seed germination was mainly due to excess soil moisture. Around 12% of farmers reported delayed germination.
- Most farmers (58%) said there was a mild effect of pest and disease infestation, while some (31%) said there was no effect. This means that even though pest problems were not very severe, the poor plant vigor of the crop plants made them more sensitive to infections.
- The majority (68%) did not go for seed treatment; only 32% used traditional & organic methods.

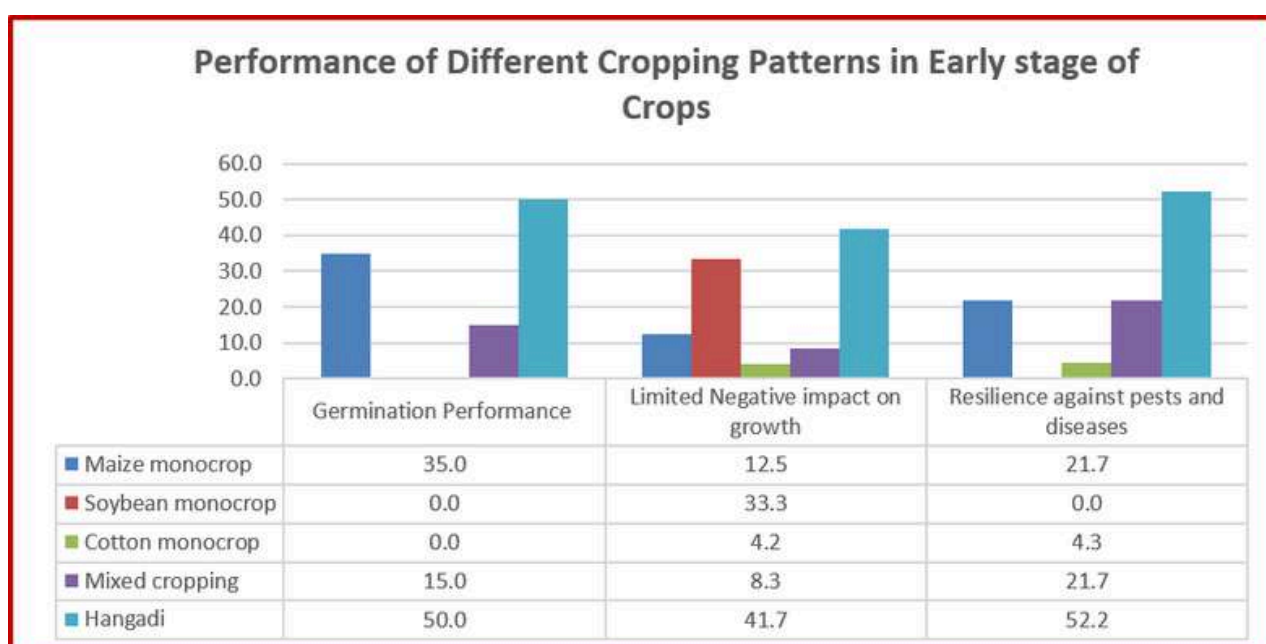


Figure 15 Cropping Systems and performance during the early stage of crop (Kharif 2025)

- Across most FGD villages, farmers clearly said that Hangadi farming performed best in germination. Hangadi cropping methodology includes many crops; even if one crop fails, others survive and add upon to give crop yields. This gives farmers a better overall plant stand and reduces the risk of complete loss.
- 50% of farmers indicated that within Hangadi germination performance was better than other systems, while 35% indicated it was better in the case of maize monocrop, and 15% indicated it within the mixed farming system. (Figure-16)
- Farmers were of the opinion that Hangadi farming practice is safer and suffers the least from weather stress (41% of farmers shared this). While 33.3% of farmers also shared initial better growth on soybean monocrop.

- In Hangadi fields, some crops always managed to grow even when rainfall or temperature was unfavorable. In contrast, monocropping systems, especially soybean, were badly affected because all plants faced the same risk at the same time.
- The hangadi system is seen as the most resilient (52.2%) against pest and disease infestations, followed equally by the mixed and maize systems (21.7% each).

4.5 Production

With regards to production, most farmers (65%) said that grain production was lower than normal this year. Many participating farmers reported very low production or even total crop failure. This shows that the season was very difficult from a farming point of view. Only a few representative villages experienced normal production, which means that for most farmers, income from crops was badly affected this year.

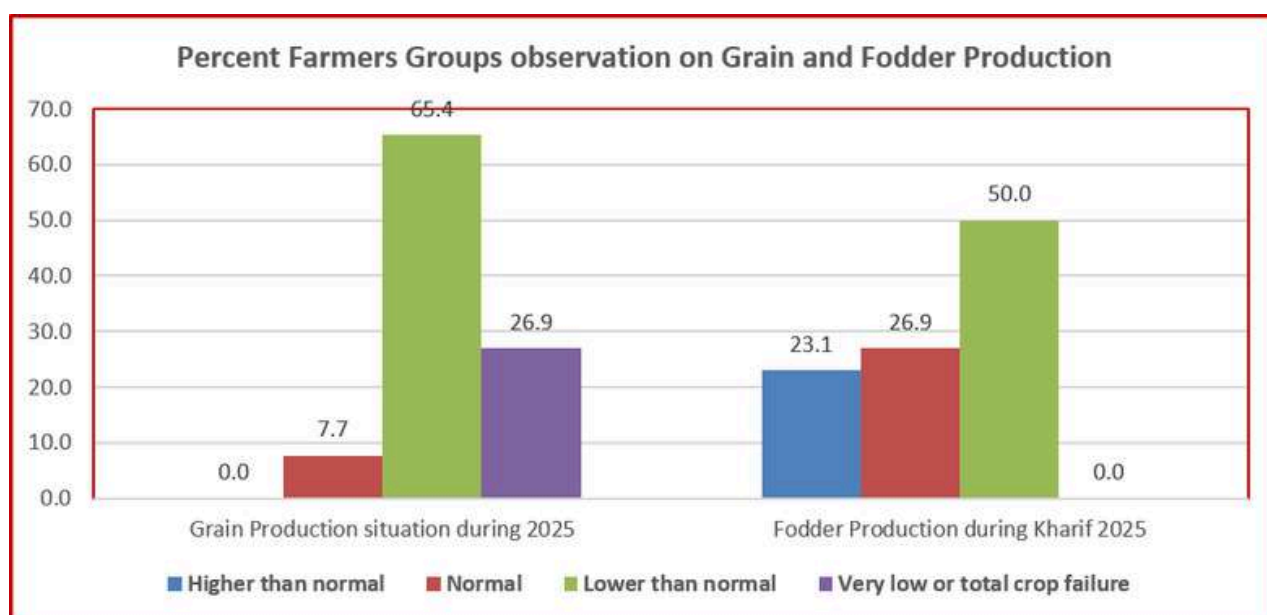


Figure 16 Observations pertaining to Grain and Fodder Production

Farmers shared that fodder production was mostly low. Some FGD participants reported average fodder, but overall, there was a shortage of fodder for livestock. This shortening of fodder increased the burden on the farming community, as they had to either buy fodder from outside or reduce the number of animals they keep, which is a difficult option. Almost all participating farmers of this view that the main reason for low production was deficit or excess rainfall observed during the cropping season. Some farmers also mentioned that declining soil fertility and pests and diseases added to the problem, but weather remained the biggest cause. This shows that farming has become highly dependent on unpredictable climate conditions, making farmers more vulnerable every year.

Many farmers (53%) said they followed traditional practices of organic manure to improve soil health and crop growth. Some farmers also said they did not take any special measures, either because they lacked money or because they were unsure and wanted to invest much in such difficult seasons. This shows the need for better guidance and technical support so farmers can adopt effective practices to improve production in changing climatic conditions.

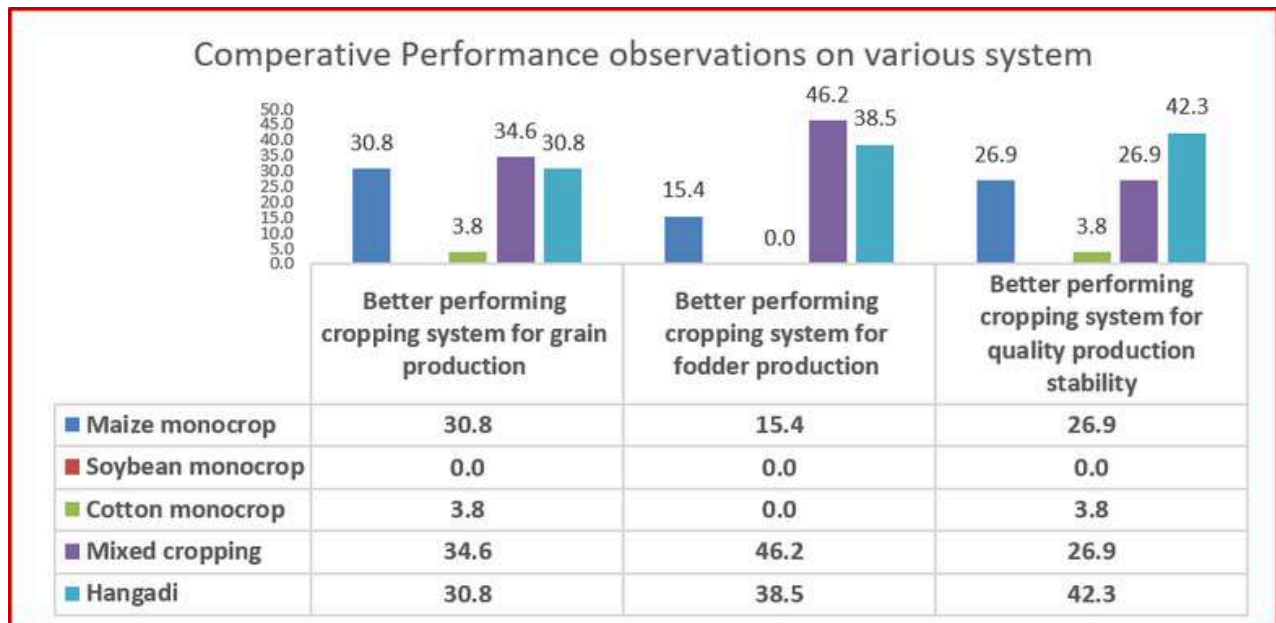


Figure 17 Comparative situation about the grain, fodder and quality production

The comparative situation about the quality of production of grain and fodder and the quality of production as shown in figure-17 brings a very interesting situation, indicating that mixed cropping gave the best grain (34.6%). The other two traditional systems, hangadi and maize monocropping, performed almost similarly (30.8%). Maize monocropping came second in many places, but farmers felt that mixed cropping was safer because even if one crop fails, others still produce. The farmers' reaction on this point was that mixed cropping practice produced the most quantity of fodder.

Hangadi farming also performed well in several villages because it includes many crops that can be used as fodder. These cropping systems helped farmers to manage livestock better, even in a bad season. Farmers felt that Hangadi farming gave the most stable quality of produce over time. Mixed cropping also performed well, while monocropping was seen as less stable because quality changes sharply with unstable weather conditions. This shows that diverse cropping systems protect not just quantity but also quality of farm produce. (Annexure-5)

4.6 Nutrition and food security

During FGD one of the critical aspects of production and utilisation was about the farming and its relation with diet diversity and nutrition.

- ◆ Fifty-four percent farmers reported that this year pulses availability was affected negatively with very limited availability 23% felt limited while 8% indicated non-availability of pulses.
- ◆ With regards to vegetables 62% farmers got regular and adequate supply from own cultivation, 27% got limited quantity, and remaining 11.5% could get very limited quantity.

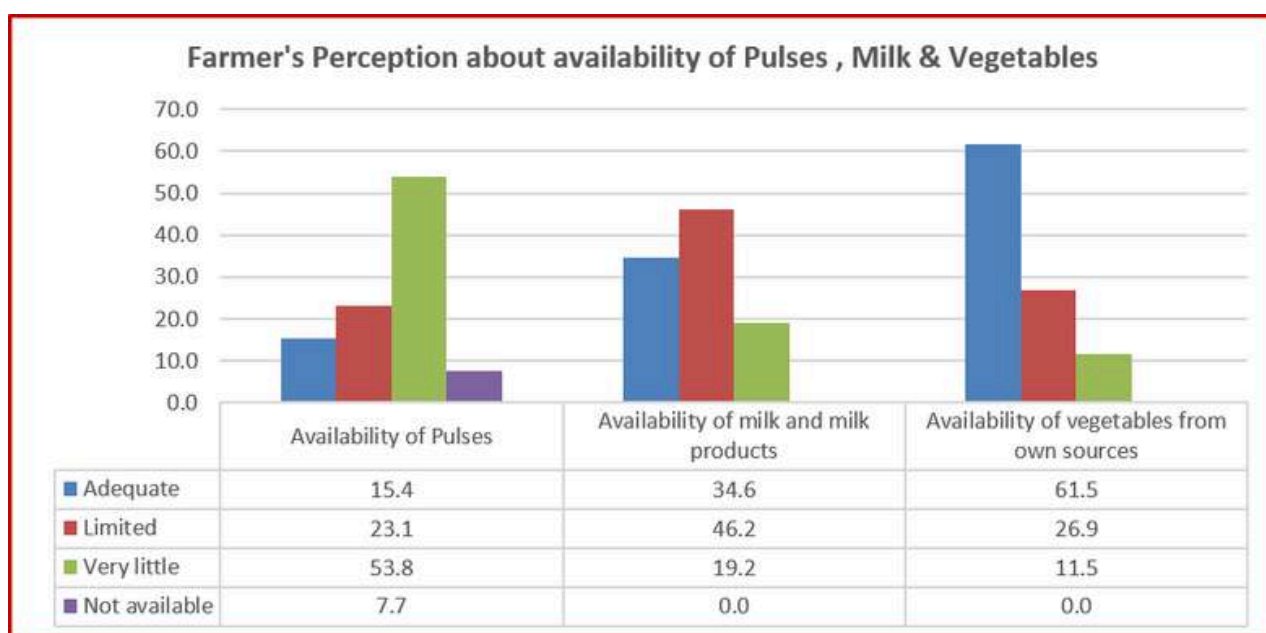


Figure 18 Perception about the availability of Pulses, Milk and Vegetables

- Forty-six percent of farmers reported limited availability of milk, and 19% reported very limited quantity, but the remaining 35% felt milk production was adequate
- An average to good family diet was observed and reported during FGD discussions, whereas some even said it was very good. However, FGDs revealed that this diversity often depended on whether families practiced mixed cropping or Hangadi farming. Families depending only on monocropping had less variety in food to eat for their families



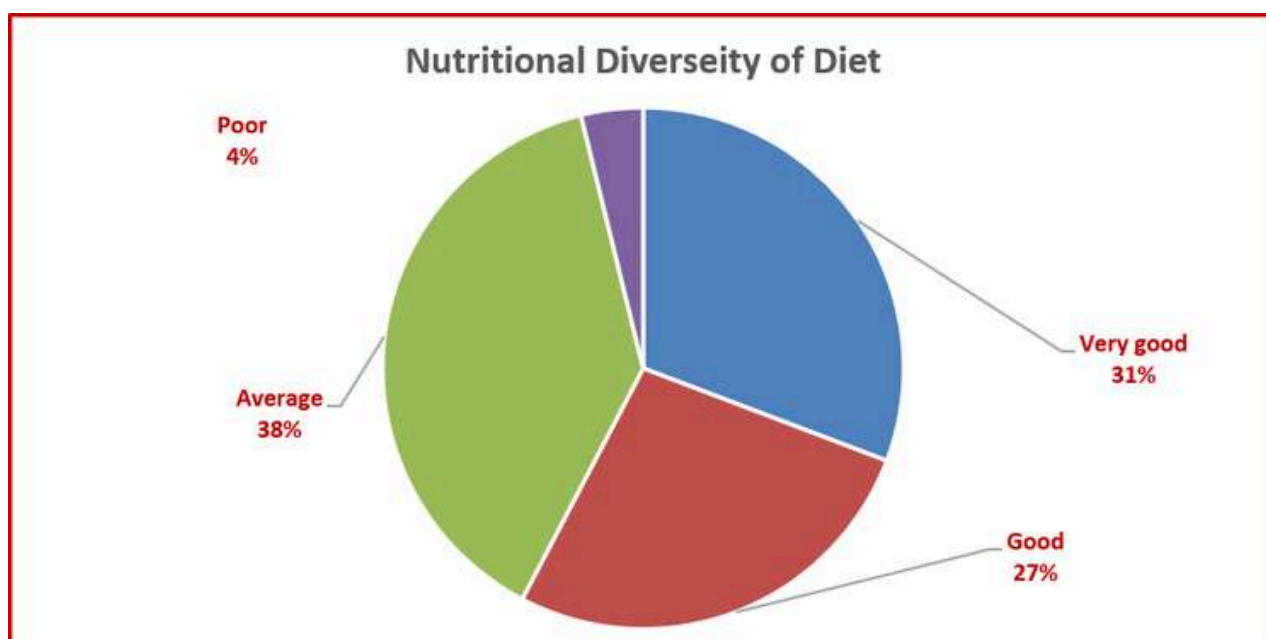


Figure 19 Nutritional Diet Diversity situation during Kharif 2025

Many families (54%) said their dependence on the market was somewhat high. This means that when own production is low, families have to spend more money to buy food. In bad years, this increases stress on household budgets and reduces the ability to save or invest in farming.

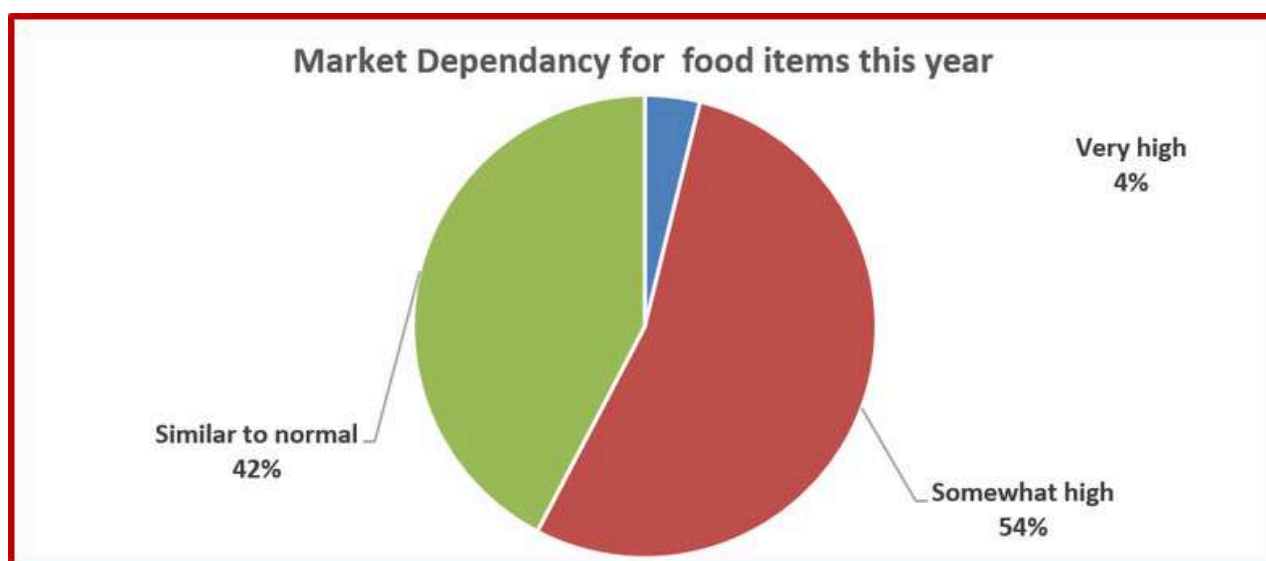


Figure 20 Market Dependency during the Kharif 2025

A comparative observation about the performance of different systems for food availability and market dependency indicates that food availability (grains, pulses, and vegetables) is best with Hangadi (58% of farmers), followed by mixed cropping (30.8%), which came as the second option to choose. Similarly, Hangadi has the least dependency on the market (62%), followed by mixed farming (30.8%). (Data in Annexure-6)

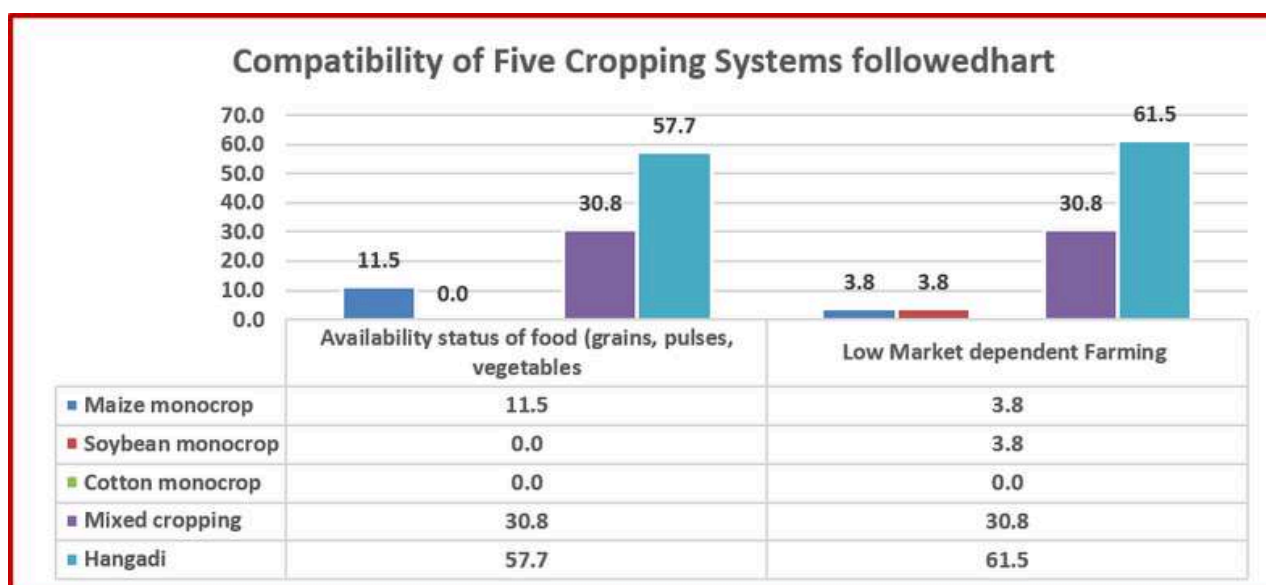


Figure 21 Comparison on availability of food and market dependency

4.7 Cost and income

To capture cost and income aspects key factor was to find out input cost in farming in the year with reference to previous year. Among participating farmers, 71% indicated higher cost above previous year. Almost all villages indicated that the increase is due to higher labour charges, double sowing due to germination failure, and high input prices.

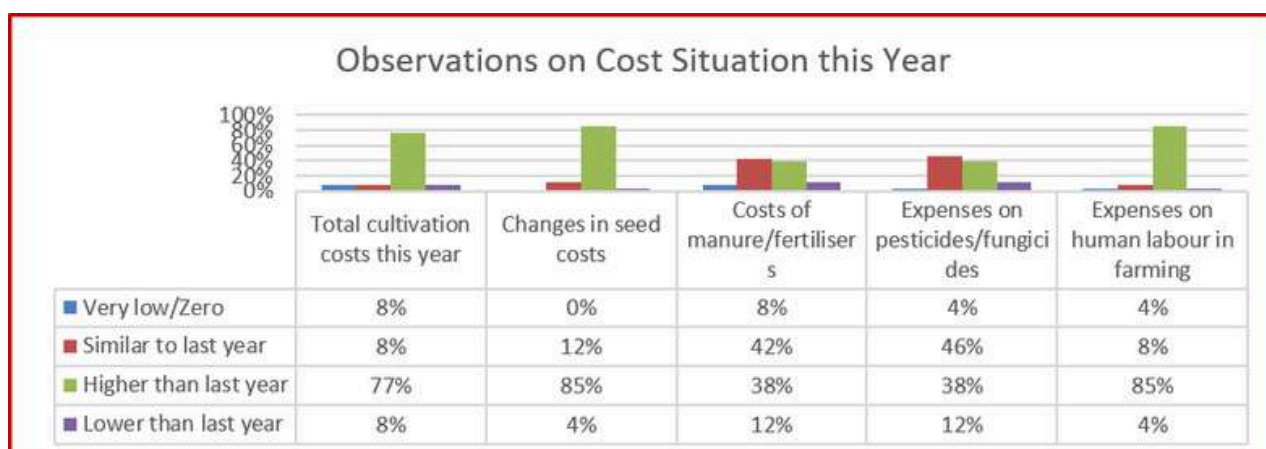


Figure 22 Observations related to various input costs

- ◆ Farmers also shared that the increase is mainly due to higher seed costs (85% of farmers) and repeated sowing. Though 42% of farmers also indicated no change in manure and fertilizer cost above the previous year, 38% indicated a slightly higher cost. 20% of farmers also indicated saving as they produced themselves.

- ◆ 16% of farmers indicated lower or negligible expenditure on pesticides and fungicides due to their own methodology. But 46% indicated negligible change, and 38% indicated the cost was higher than the previous year.
- ◆ Around 85% of farmers indicated that labor costs were high during 2025 Kharif.

Depending on this, a comparison was sought from farmers about the cost of various systems. Forty-two% indicated that Hangadi has the lowest cost among all systems in most villages, mainly due to local seeds, family labor, and natural inputs. It was followed by maize monocropping. came next, but it still required more market inputs than Hangadi farming practice.

Thirty-five percent of farmers indicated that maize monocropping gave the highest cash income/returns this year, but normally soybean alone (26.92%) and cotton alone (11.54%) give better returns. However, farmers also shared that this year's income is uncertain and depends heavily on rainfall and market prices.

Farmers (85%) strongly felt that soybean monocropping created the highest dependence on the market. They need to buy seeds, fertilizers, pesticides, and even food, because soybeans do not provide food for the family. In contrast, Hangadi and mixed cropping reduced market dependence because families could grow many of their needs at home. (Data in Annexure-7)

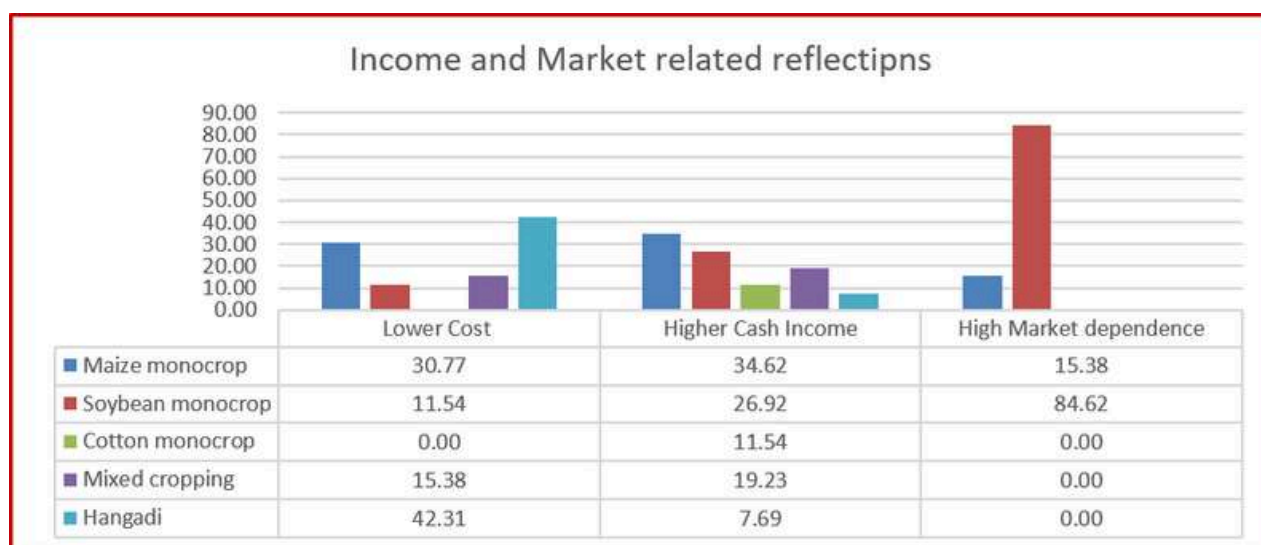


Figure 23 Comparative situation related to cost, income and market dependency

4.8 Livestock and financial status

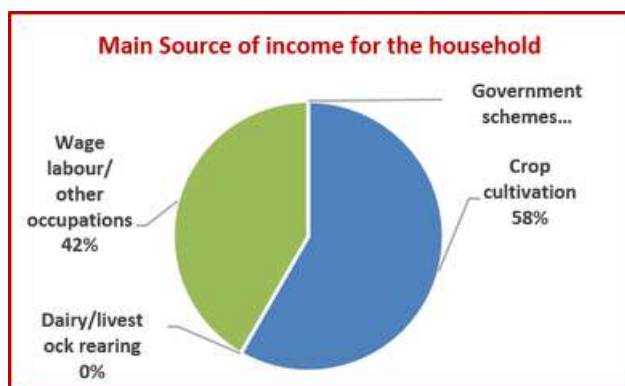


Figure 24 Main Source of Income for households

During the FGD discussions the crop cultivation came as the main source of income for farming communities (58%). At the same time, a large number of FGD families also shown dependency on wage labour (42%) and other small occupations to support their livelihood. Many families now depend on multiple income sources to survive, especially in years when crops fail.

Almost all farmer given their opinion in FGD clearly said that the biggest challenge in maintaining livelihood is the failure of the crop. Poor rainfall, waterlogging, pests, and diseases led to heavy losses, which made it very hard for families to manage daily expenses. This shows that farmers' livelihoods are now directly at risk from climate uncertainty, and a bad season can push families into financial stress very quickly. (Data in Annexure-8)

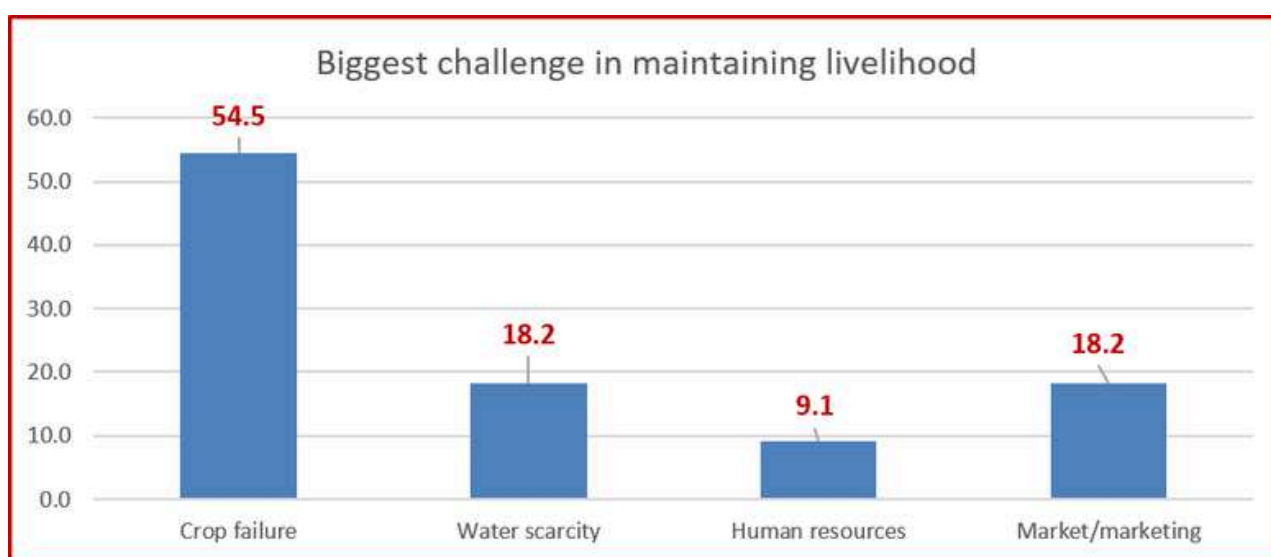


Figure 25 Biggest Challenge in maintaining livelihoods

Majority of FGD (57%) involved farmers said they did not take any special steps to increase their income. This was mainly because they were already struggling to manage losses and did not have spare money or technical knowledge to try something new. Some farmers, however, said they introduced new crops to improve income. This shows that a few families are trying to adapt, but most still need technical guidance, financial support, and exposure to improve technology to change their farming practices.

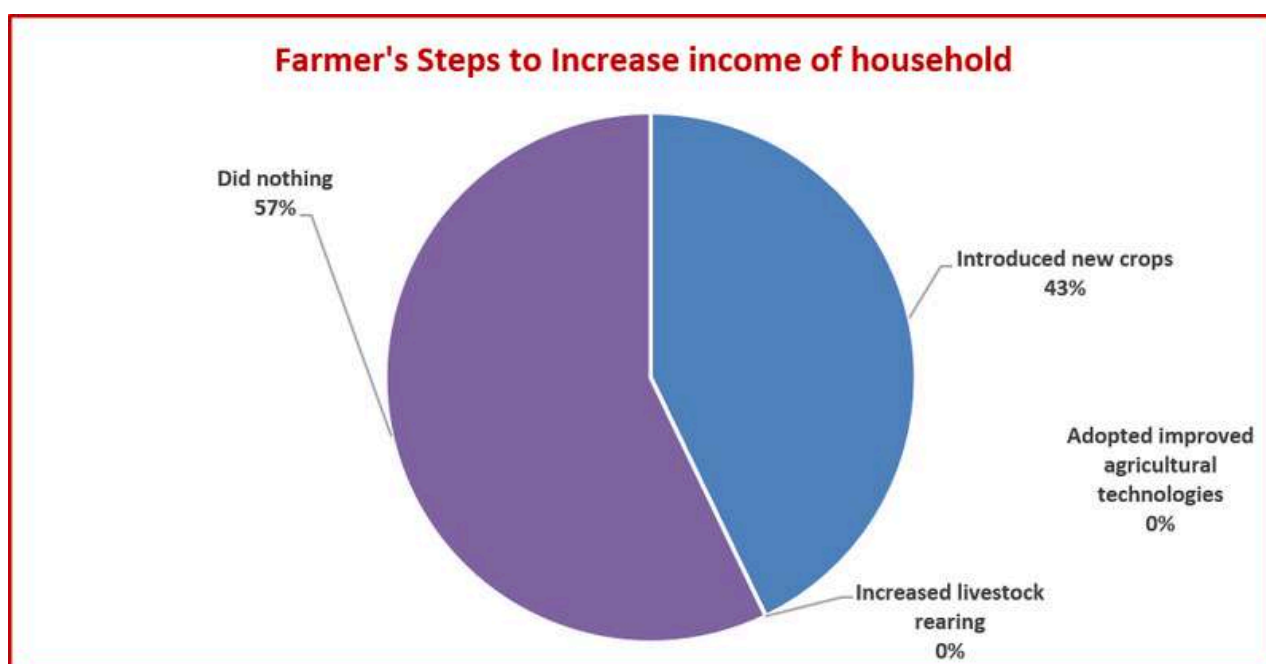


Figure 26: Farmer's steps to increase household income

4.9 Climate change and farmer response

Most FGD participating farmers (73%) described this year's weather as very abnormal. Many said that rains came at the not crop worthy/unusual time, temperatures changes were abrupt, and the season did not follow the normal climatic pattern for ease of cropping activity as usual. This shows that farmers clearly feel the impact of climate change in their daily farming activities.

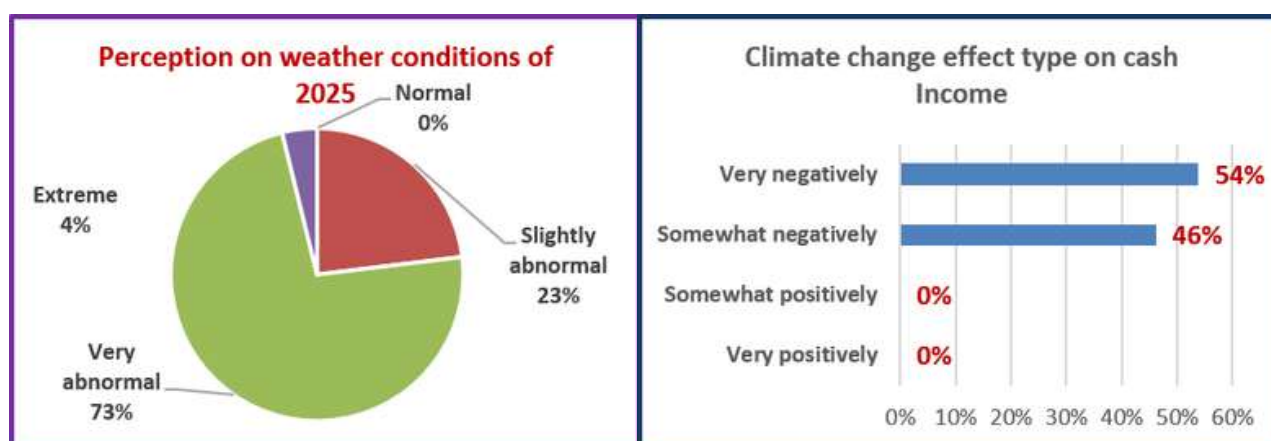


Figure 27 Weather conditions and effect on cash income

A large number of farmers (54%) were of this opinion that climate change has affected their income very negatively. Frequent crop failures, extra costs, and uncertain yields have reduced their profits in changing climatic behaviour.

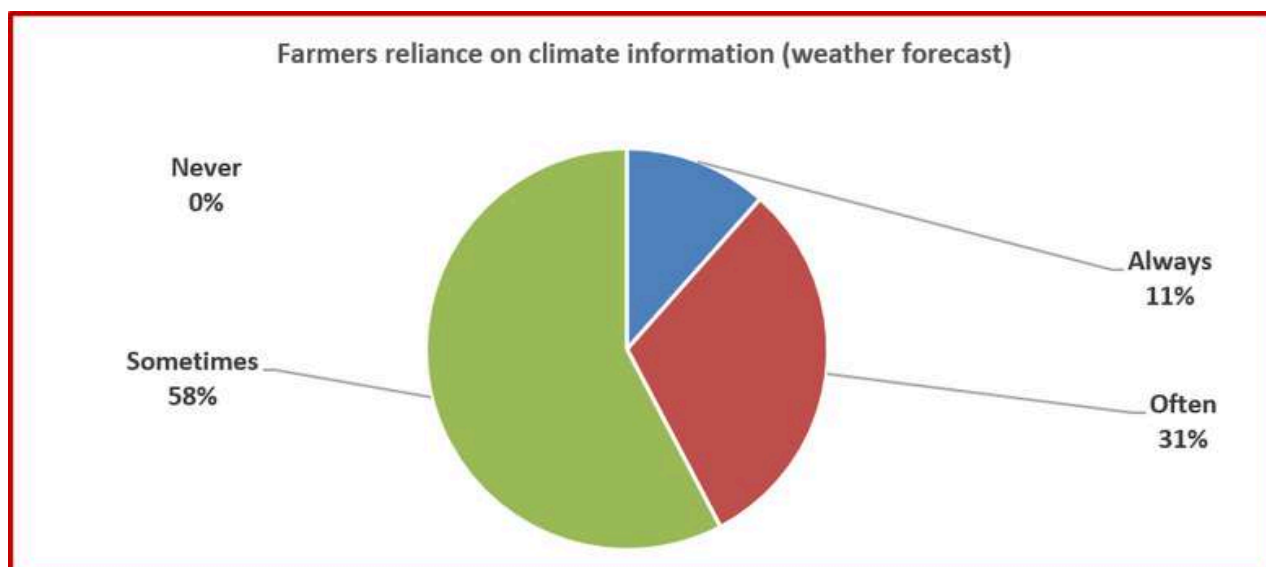


Figure 28 Data about the Reliance on weather forecast

Most farmers (58%) indicated reliance on weather information sometimes, while some indicated time to time checking. This shows farmers increasing importance of forecasts, but limited dependence due to lack of trust on information and reliability, timeliness, and understand.

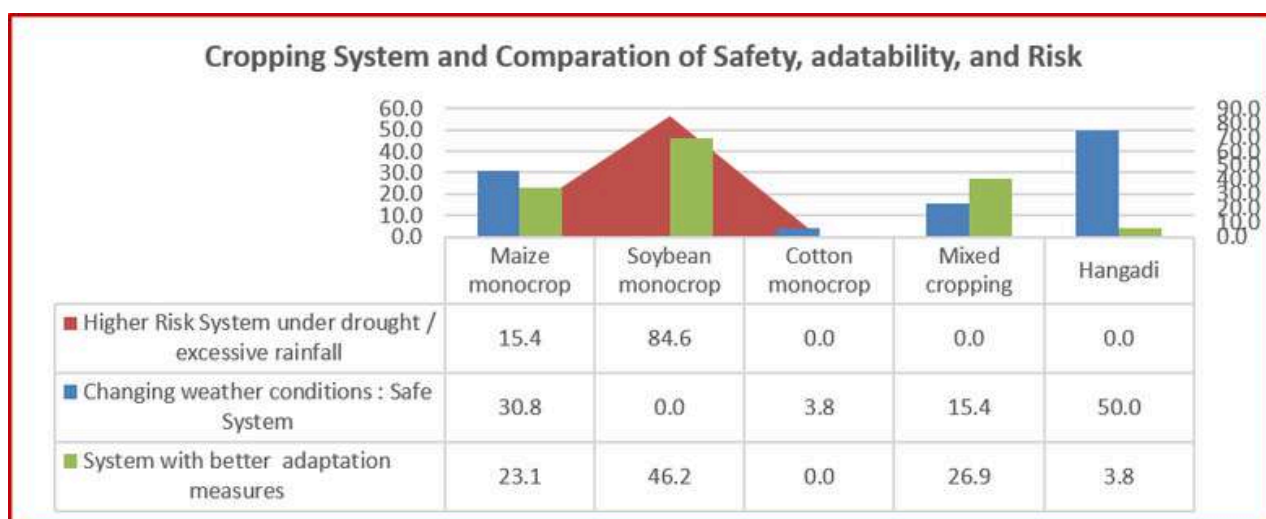


Figure 29 Various Systems against Safety, adaptability, and Risk

Figure-30 indicates that farmers felt that Hangani farming is the safest within present climate conditions, followed by traditional maize and mixed cropping. Eighty five percent of farmers experienced highest losses during the year in soybean monocropping, indicating its sensitivity to changing weather. Even though many farmers (46.2%) tried many options in soybean monocropping such as changing sowing time, double sowing, different varieties, applying additional inputs. (Data in Annexure-9)



4.10 Suggestions from participating farmers

Many farmers in changing climatic behaviour want to adopt new crops to increase their income. They feel that growing the same crops every year is no longer profitable or safe. Some farmers also said they want to shift towards organic and sustainable farming practices so that they can reduce input costs and protect the quality of their field soil. This shows that farmers are ready to change, but they need proper guidance and technical support to do so in the right way.

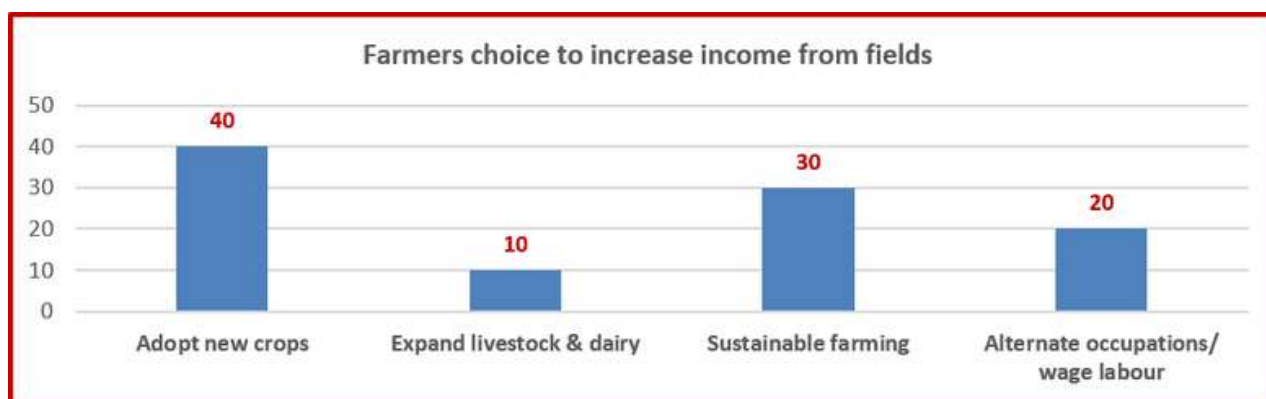


Figure 30 Farmer's choices to increase farm income form various system

Farmers clearly said that they need more training and information to deal with climate change. They want to learn:

- ◆ How to manage crops during drought and heavy rainfall conditions,
- ◆ How to choose the right crops and varieties in changing climatic conditions, and
- ◆ How to protect their fields from weather risks.

Some farmers also said they need better weather forecasts and early warnings, and access to seeds that can tolerate drought and excess rain. This shows that farmers are aware of climate challenges and are asking for practical support, not just schemes on paper.

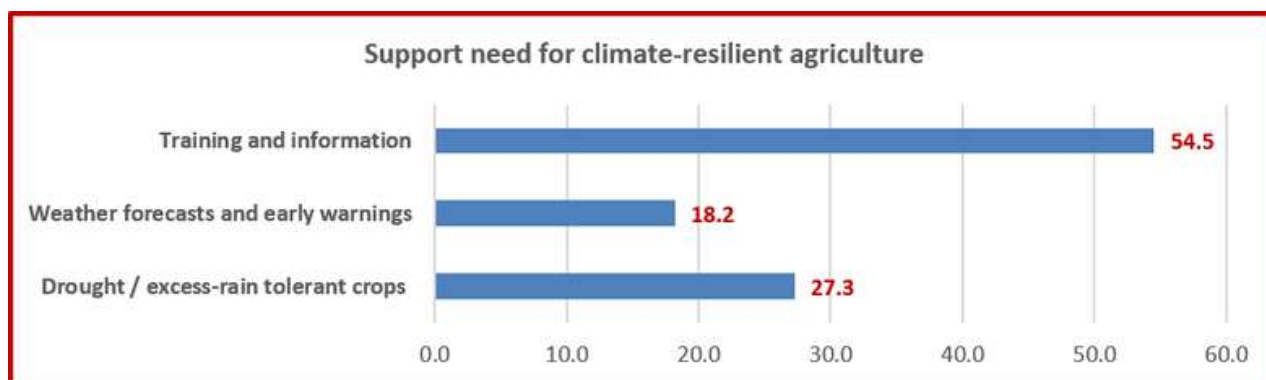


Figure 31 Training and support need of farmers for transforming to climate resilient agriculture

Among the participating farmer across all the FGDs conducted to face climatic changing pattern, majority of farmers of this views that the most important training they need is on the proper use of seeds and fertilisers. Farmers feel that many times crops fail not only because of weather, but also because they do not always know the right method, right quantity, and right time to use inputs. Some farmers also said that training on marketing and sales is important, so they can get better prices for their produce. (data is given in Annexure-10)

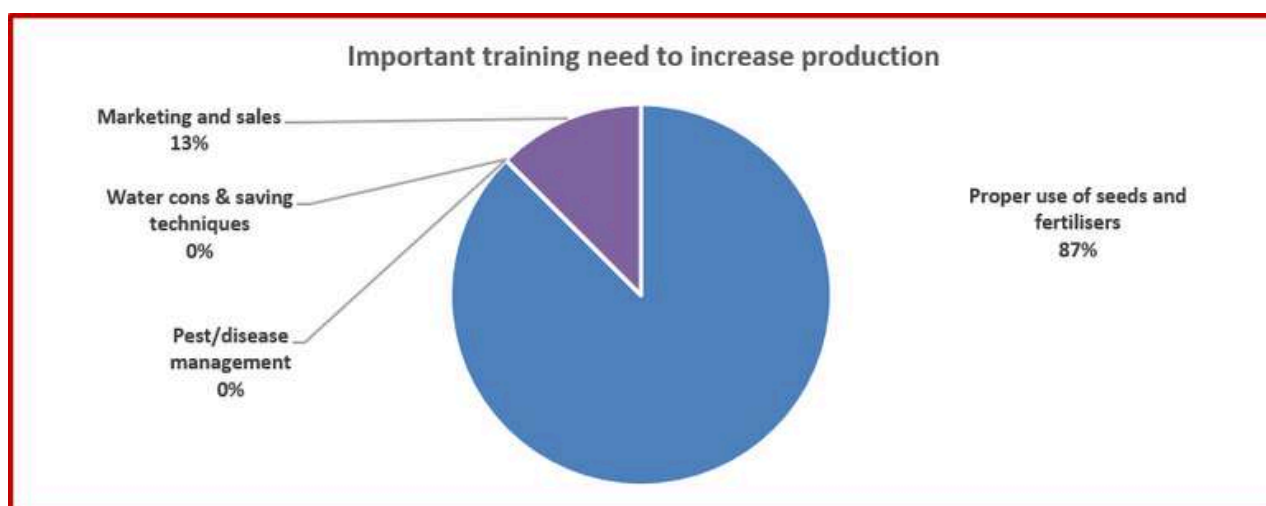


Figure 32 A few areas of training requirement for farmers

5. Reflections and Recommendations

Farmers are actively observing the increasing uncertainties in local weather conditions such as early/delayed commencing of rains, irregular pattern of rains in quantity and quality, temperature variability, and frequent storms. These changes are disturbing conventional farming schedule and forced the farmers to constantly look for change in crops and practices.

- ◆ The experience captured during the Kharif 2025 gives various aspects of farming criteria related to the five prominently following pattern at the junction of Gujarat, Madhya Pradesh, and Rajasthan.
- ◆ Farmers across all regions in majority reported that the weather has become highly abnormal. Uncertain and abrupt behaviour of rainfall like either commencing too early, too late, or too heavily.
- ◆ During Kharif 2025 large areas of land remained unsown because of excessive initial rains leading to waterlogging in farms. The presence of black cotton soil and limited water movement.
- ◆ Sowing of soybean monocropping was affected most as it is normally cropped in plain black cotton soils, where water logging was more prominent. On the other hand, Hanagni, which is normally done in fields which are called Mal Khet, where sowing was affected least. In this use of bullock-based ploughing and sowing was easy while tractor-based sowing proved difficult resulting in delayed sowing.
- ◆ Monocropping of both soybean and Maize faced germinations issues, but soybean faced more due to almost failure of germination and farmers have to sow twice.
- ◆ Mixed cropping faced same issue but maize germination in sloping fields was good. Germination was better in Hanagni for maize, okra, cotton, pigeon-pea, un-cultivated greens, and groundnut germinated good, and damage was also low weather.
- ◆ The FGDs on crop production clearly show that Kharif 2025 was a very challenging season for farmers. Grain and fodder production were mostly below normal, and many farming families faced serious income deficit and fodder shortage. The main reason behind low production was indeterminate and irregular rainfall, both too much and too little at not worthy crop stages/ at the wrong time.

- ◆ This confirms that climate change is creating the biggest risk to farming community. At the same time, the discussions clearly highlight that mixed cropping and Hangadi farming performed better on account of grain output, fodder availability, and better quality of produce.
- ◆ Grain and fodder production were lower than normal in most villages. However, mixed cropping and Hangadi systems performed better, providing more stable yields and fodder even in a bad season.
- ◆ Household nutrition has been affected, especially the availability of pulses and milk. Many families are becoming more dependent on the market for food. At the same time, families practicing hangadi and mixed cropping had better access to diverse foods and showed stronger food security as compared to monocropping of cash crops like soyabean and cotton.



Soyabean Cropping



Cotton Monocropping



Mixed Farming



Maize Monocropping



Hangadi

Figure 33 Prevailing farming system among the study community

Reflections highlight systems like Hangadi and mixed nutrition sensitive farming play important role in food security. They help families by, providing diverse food groups at home, reducing dependence on the market, and improving overall diet quality and nutrition.

- ◆ Although monocropping systems like maize and soybean can give higher cash income in good years, but have higher risks and market dependence. On the other hand, Hangadi farming stands out as a low-cost and safer system, helping farmers reduce expenses and protect themselves during bad seasons. Promote low-cost, climate-resilient farming systems, reduce farmers' dependence on costly external inputs, and support farmers with better access to affordable seeds, labour-saving methods, and local resources.
- ◆ Farming costs have increased sharply especially for seeds, labour, and inputs. Although soybean monocropping can give better cash income, but at higher risks and higher market dependence. Hangadi, stood out as a low-cost and safer system.

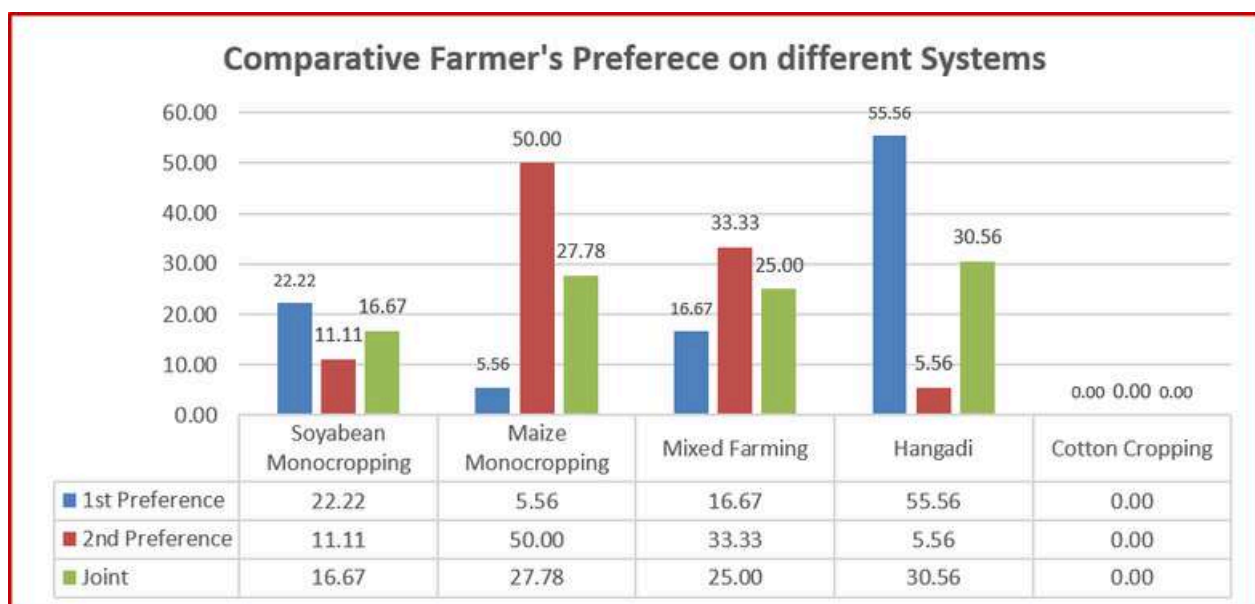


Figure 34 Occurnece of different farming system within preference table

- ◆ Farming is the main source of Livelihood and Income, but due to climate change induced weather variability crop failure, particularly monocropping has become the biggest threat. A large number of farmers now look for wage-labour and other work as a survivor strategy. Only a few have been able to try new crops or strategies to improve income. These findings highlight the urgent need to; support farmers with diversified livelihood options, promote climate-resilient farming systems, and provide training and handholding to adopt new income-generating practices.

- ◆ **Climate Change and Farmer Response:** Farmers strongly feel the impact of climate change on their income and farming confidence. Hangadi farming followed by mixed cropping are the safest system under changing weather. The FGDs clearly show that participating farmers are very aware of climate change and its effects. They feel that weather patterns are no longer normal, and this is directly hurting their crop produce, income and normalcy of livelihood. Among all farming systems consider under the study, Hangadi farming system stands out as the safest and most reliable under changing climate conditions. It reduces risk by spreading it across many crops. Monocropping particularly soybean has emerged as the most vulnerable option owing to input demand, losses at the face of climate stress. The study highlights urgent need towards farmers led climate-resilient farming approach, with clear and timely climate information, and support farmers with practical adaptation strategies that reduce risk and stress
- ◆ The reflections also indicate that farmers are ready to transform, but need a systematic approach and institutional support to build confidence.
- ◆ Farmers have expressed continued learning and action on evolving a system suitable for the changing climatic situations for sustainable practices, seeds, combinations, and crop mixes for climate resilience. It will also need weather information and tolerant seed varieties.

Table 2: Preference Table showing appearance of various systems (details in Annexure-11)

Aspects	1st Preference & Response Percent		2nd Preference & Response Percent	
Most affected cropping System due to irregular rainfall	Soybean monocrop	78%	Maize monocrop	17%
Cropping system faced maximum difficulty due to excessive rain	Soybean monocrop	75%	Maize monocrop	20%
Results in the delayed sowing situation	Hangadi	52%	Maize monocrop	28%

Based on current benefits - Priority System	Mixed cropping	46%	Mixed cropping	46%
Cropping system with better long-term production stability	Hangadi	50%	Mixed cropping	27%
Cash Income based Profitable System	Soybean monocrop	31%	Mixed cropping	27%
Better cropping for grain production	Mixed cropping	35%	Maize monocrop	31%
cropping system for fodder production	Mixed cropping	46%	Hangadi	38%
Better performing cropping system for quality production stability	Hangadi	42%	Maize monocrop	27%
Germination Performance	Hangadi	50%	Maize monocrop	35%
No negative impact of weather on growth	Hangadi	42%	Soybean monocrop	33%
Resilience against pests and diseases	Hangadi	52%	Maize monocrop	22%
Availability of grains, pulses, vegetables	Hangadi	58%	Mixed cropping	31%
Minimum Market dependent Farming	Hangadi	62%	Mixed cropping	31%
Lowest Cost	Hangadi	42%	Maize monocrop	31%

Highest Cash Income	Maize monocrop	35%	Soybeanmonocrop	27%
Most market dependence	Soybean monocrop	85%	Maize monocrop	15%
Cropping system safest under changing weather conditions	Hangadi	50%	Maize monocrop	31%
Cropping system facing Highest losses under drought / excessive rainfall	Soybean monocrop	85%	Maize monocrop	15%
Cropping system that farmers have better adaptation measures	Soybean monocrop	46%	Mixed cropping	27%

6. Conclusion

This action research carried out during Kharif 2025 cropping season by 620 farmers of indigenous communities from 26 Kisan Evam Adiwasi Swaraj Sangathan spread over in six districts of the states of Gujarat, Madhya Pradesh and Rajasthan. It is a rich collection of first-hand experience of indigenous farmers relating to monocropping, conventional mix cropping, and traditional Hangadi system. (data is given in Annexure-12)

- The Farming systems based on single crops and heavy market dependence are no longer safe under changing climate conditions. In contrast, diversified systems like Hangadi farming and mixed cropping consistently performed better across to secure sizable food and fodder production, lessening cost of production, food and nutrition security, climate resilience, and maintaining livelihood stability.
- Though monocropping may bring higher income in normal years, it exposes farmers to greater risk in bad years, pushing them into debt, food insecurity, and livelihood stress. The FGDs perceptions clearly show that farmers view and trend are now moving away from depending only on monocropping. Their experiences with low yields, crop failures, and market risks have pushed them to look for more secure farming systems.
- On the other hand, Hangani farming and mixed cropping are being valued more for, stable production, better-soil-health, low-market dependence and better diet diversity. Farmer's opinion points out towards the need for diversified and resilient farming systems, such as mixed cropping and Hangadi, which can reduce risk, protect food security, and provide more stable livelihoods in the era of unpredictable weather.
- Farmers have ultimately proved need of adopting a farming system that can be based on beneficial aspects of the three system. These findings strongly suggest that to protect farmers' livelihoods, there is a need to move away from single crop due to high risk have encouraged them to try mixed cropping and Hangadi farming practices. While monocropping still brings cash income in good years, farmers now recognise that it is unsafe in the long run. Reduce of over dependency on single crop/monocrop farming, and this shows a need for action research on incorporation on various cash crops within the wider perspective of indigenous systems of Hangani and Mix Cropping.
- Adopting to Farmer's Field School (FFS), which is a participatory learning and action approach could be tool for agricultural transformation evolving better climate smart practices to address increasing weather variability, which can be supported with a community managed weather information mechanism.

Table 3
Study Execution Plan

Unit Name	KASS Name	FGD Place	FGD Date	Total Participants
Hiran	Bhagatpura	Bhimpur	14/10/2025	23
Hiran	Bhilkuan	Godawara Nareng	18/10/2025	25
Hiran	Potliya	Thummath	29/10/2025	25
Hiran	Bhilkuan	Dugripada	30/10/2025	26
Hiran	Timeda	Kotra	31/10/2025	26
Mahi	Ghatol	Salaria	15/10/2025	23
Mahi	Ganoda	Madanpura	16/10/2025	23
Mahi	Chanduji ka Gada	Timbagamdi	17/10/2025	20
Mahi	Chanduji ka Gada	Shankarpura	28/10/2025	25
Mahi	Piplakhoont	Tamtiya	29/10/2025	28
Mahi	Piplakhoont	Kalighati	27/10/2025	25
Mahi	Khamera	Roop Ji Ka Kheda	18/10/2025	21
Mahi	Bhungda	Delia Talab	17/11/2025	26
Mahi	Bhungda	Miysa	17/10/2025	26
Mahi	Sabla	Myala	15/10/2025	25
Mahi	Aspur	Rama Dhani	15/11/2025	25
Mahi MP	Thandla	Daulatpura	16/10/2025	25
Mahi MP	Sailana	Mahudipada	17/10/2025	28
Mahi MP	Mataji	Ratangarh Peeth	27/10/2025	25
Mahi MP	Bajna	Bhadan Khurd	27/11/2025	25
Mangadh	Gangadtalai-1	Jagpura	16/10/2025	24
Mangadh	Jhalod	Thuthi Kankasia	14/10/2025	21
Mangadh	Gangadtalai-1	Ratan Tori	17/10/2025	16
Mangadh	Fatehpura	Madhava	15/10/2025	19
Mangadh	Anandpuri	Khandora	14/10/2025	20
Mangadh	Anandpuri	Mundri	6/11/2025	25

Male Participants	Female Participants	Community Organizer	FGD Organizer
6	17	Mishrimal	Srishti M
12	13	Lalita Garasia	MKD
14	11	Rajeshwari Ji	Srishti M
12	14	Indrajeet Dodiya	D Kumar
18	8	Pinky Bhabhor	M Prajapat
10	13	Indira Charpota	Srishti M
17	6	Dinesh Barod	Srishti M
7	13	Kaluram	Srishti M
15	10	Walchand Charpota	D Kumar
10	18	Kalpana Ninama	D Kumar
12	13	Premalata	D Kumar
9	12	Ramlal	M Prajapat
14	12	Ramila	MKD
16	10	Ganesh Lal	MKD
15	10	Prakash	MKD
16	9	Kamla Kumari Rot	D Kumar
7	18	Parthing	D Kumar
11	17	Divya Sharma	D Kumar
14	11	Mohan Ji	MKD
6	19	Balaram	MKD
17	7	Pradeep Kumar	M Prajapat
9	12	Natwar Garasia	M Prajapat
7	9	Prahlad Singh	M Prajapat
11	8	Girish Patel	M Prajapat
9	11	Virendra	MKD
6	19	Kamla Ji	MKD

ANNEXURE 1 *Weather & Climate Change*

		(a)	(b)	(c)	(d)	(e)	1st Preference	%	2nd Preference	%
		On time	15 days later than normal	1 month later than normal	Earlier than normal					
1.1	In this year, when did the rains begin?	19.2	0.0	0.0	80.8	0.0	Earlier than normal	81%	On time	19%
		More than normal	Less than normal	About normal	(Irregular					
1.2	How was the total amount of rainfall?	53.8	0.0	0.0	46.2	0.0	More than normal	54%	Irregular	46%
		Normal	Too hot	Too cool	Frequent changes					
1.3	What was the impact of temperature during the entire monsoon season?	3.8	50.0	7.7	38.5	0.0	Too hot	50%	Kept changing frequently	38%
		No effect	Leaves/flowers dropped	Crop lodged/fell down	Entire crop affected					
1.4	What was the effect of wind and storms on your crops?	3.8	0.0	46.2	50.0	0.0	Entire crop affected	50%	Crop lodged/fell down	46%
		June	July	August	September					
1.5	In which month were conditions most difficult for crops?	3.8	57.7	34.6	3.8	0.0	July	58%	August	35%

		Sowing on time	Delayed sowing	Changed crop	Could not sow at all	The seed did not germinate				
1.6	How did weather uncertainty affect your crop planning?	0.0	11.1	77.8	5.6	5.6	Changed crop	78%	Delayed sowing	11%
		Maize monocrop	Soybean monocrop	Cotton monocrop	Mixed cropping	Hangadi				
1.7	Due to long and irregular gaps in rainfall, which cropping system was most affected?	17.4	78.3	0.0	0.0	4.3	Soybean monocrop	78%	Maize monocrop	17%

ANNEXURE 2- Land preparation & Sowing

	Particulars	Less than 10%	10-25%	25-50%	50-75%	More than 75%	1st Preference	%	2nd Preference	%
1	Percent Land faced no-sowing during Kharif 2025	0	1	8	13	4	50-75%	50%	25-50%	31%
		Adequate moisture	Excessive moisture	Very low/dry soil	Field waterlogged					
2	Soil moisture status at the time of sowing	1	23	1	1	0	Excessive moisture	88%	Adequate moisture	4%
		Only own traditional/ local seed	Own local Seed and Purchased Seed	Taken from neighbours	Entirely purchased from market					
3	Seed source for sowing	0	25	0	1	0	Partly own local seed and partly purchased	96%	Entirely purchased from market	4%
		Maize monocrop	Soybean monocrop	Cotton monocrop	Mixed cropping	Hangadi				
4	Cropping system faced maximum difficulty due excessive rain	4	15	0	0	1	Soybean monocrop	75%	Maize monocrop	20%
5	System Gave better results in the delayed sowing situation	7	0	0	5	13	Hangadi	52%	Maize monocrop	28%

	Particulars	Less than 25%	25-50%	50-75%	More than 75%		1st Preference	%	2nd Preference	%
1	Percent Land faced no-sowing during Kharif 2025	3.8	30.8	50.0	15.4		50-75%	50%	25-50%	31%
		Adequate moisture	Excessive moisture	Very low/dry soil	Field waterlogged					
2	Soil moisture status at the time of sowing	3.8	88.5	3.8	3.8	0.0	Excessive moisture	88%	Adequate moisture	4%
		Own local Seed and Purchased Seed	Entirely purchased from market							
3	Seed source for sowing	96.2	3.8	0.0	3.8	0.0	Partly own local seed and partly purchased	96%	Entirely purchased from market	4%
		Maize monocrop	Soybean monocrop	Cotton monocrop	Mixed cropping	Hangadi				
4	Cropping system faced maximum difficulty due excessive rain	20.0	75.0	0.0	0.0	5.0	Soybean monocrop	75%	Maize monocrop	20%
5	System Gave better results in the delayed sowing situation	28.0	0.0	0.0	20.0	52.0	Hangadi	52%	Maize monocrop	28%

		Monocropping	Mixed cropping	Hangadi	All of the above					
1	Farming Systems Followed during monsoon 2025	2	2	1	21	0	All of the above	81 %	Monocropping	8%
		Good production	Average production	Low production	No production at all					
2	What was the experience of monocropping	0	6	13	7	0	Low production	50 %	No production at all	27 %
		Reduced incidence of pests and diseases	Maintained soil fertility	Higher production	No benefit					
3	Benefits observed by Practitioners of mixed cropping	0	8	2	1	0	Maintained soil fertility	73 %	Higher production	18 %
		Dietary diversity / improved nutrition	Reduced dependence on market	Higher cash income	Increased biodiversity	Some crop				
4	Benefits observed by Practitioners of Hangadi farming	2	3	1	1	3	Reduced dependence on market	30 %	Reduced dependence on market	30 %
		Millet/coarse cereals	Hangadi farming	Monocropping	Commercial crops					
5	New Cropping or System Practiced this year	15	6	4	1	0	Millet/coarse cereals	58 %	Hangadi farming	23 %
		Maize monocrop	Soybean monocrop	Cotton monocrop	Mixed cropping	Hangadi				
6	Based on current benefits, which system will you prioritise in future?	2	0	0	12	12	Mixed cropping	46 %	Mixed cropping	46 %
7	In which cropping system has long-term production stability been higher?	4	1	1	7	13	Hangadi	50 %	Mixed cropping	27 %
8	From the point of view of cash income, which system has been most profitable?	6	8	2	7	3	Soybean monocrop	31 %	Mixed cropping	27 %

		Monocropping	Mixed cropping	Hangadi	All of the above					
1	Farming Systems Followed during monsoon 2025	7.7	7.7	3.8	80.8	0.0	All of the above	81 %	Monocropping	8%
		Average production	Low production	No production at all						
2	What was the experience of monocropping	23.1	50.0	26.9		0.0	Low production	50 %	No production at all	27 %
		Maintained soil fertility	Higher production	No benefit						
3	Benefits observed by Practitioners of mixed cropping	72.7	18.2	9.1		0.0	Maintained soil fertility	73 %	Higher production	18 %
		Diet Diversity	Low Market dependence	Cash Income	Better Biodiversity	Some crop				
4	Benefits observed by Practitioners of Hangadi farming	20.0	30.0	10.0	10.0	30.0	Reduced dependence on market	30 %	Reduced dependence on market	30 %
		Millet/coarse cereals	Hangadi farming	Monocropping	Commercial crops					
5	New Cropping or System Practiced this year	57.7	23.1	15.4	3.8	0.0	Millet/coarse cereals	58 %	Hangadi farming	23 %
		Maize monocrop	Soybean monocrop	Cotton monocrop	Mixed cropping	Hangadi				
6	Based on current benefits : Priority System	7.7	0.0	0.0	46.2	46.2	Mixed cropping	46 %	Mixed cropping	46 %
7	Cropping system with better long-term production stability	15.4	3.8	3.8	26.9	50.0	Hangadi	50 %	Mixed cropping	27 %
8	Cash Income based Profitable System	23.1	30.8	7.7	26.9	11.5	Soybean monocrop	31 %	Mixed cropping	27 %

ANNEXURE 4 Production

	Aspects	Higher than normal	Normal	Lower than normal	Very low or total crop failure					
1	Grain Production situation during 2025	0	2	17	7	0	Lower than normal	65%	Very low/Crop failure	27%
2	Fodder Production during Kharif 2025	6	7	13	0	0	Low	50%	Average	27%
		Deficit/excess rainfall	Pests/diseases	Declined soil fertility	Other					
3	Perceived key reason for low production	19	0	1	0	0	Deficit/excess rainfall	95%	Declined soil fertility	5%
		Use of fertilisers	Use of organic manure	Timely sowing	No specific measures					
4	Method adapted to maintain production	3	10	0	6	0	Use of organic manure	53%	No specific measures	32%
		Maize monocrop	Soybean monocrop	Cotton monocrop	Mixed cropping	Hangadi				
5	Better performing cropping system for grain production	8	0	1	9	8	Mixed cropping	35%	Maize monocrop	31%
6	Better performing cropping system for fodder production	4	0	0	12	10	Mixed cropping	46%	Hangadi	38%
7	Better performing cropping system for quality production stability	7	0	1	7	11	Hangadi	42%	Maize monocrop	27%

	Questions	Higher than normal	Normal	Lower than normal	Very low or total crop failure		1st Preference	%	2nd Preference	
1	Grain Production situation during 2025	0.0	7.7	65.4	26.9	0.0	Lower than normal	65%	Very low/Crop failure	27%
2	Fodder Production during Kharif 2025	23.1	26.9	50.0	0.0	0.0	Low	50%	Average	27%
		Deficit/excess rainfall	Pests/diseases	Declined soil fertility	Other					
3	Observed key reason for low production	95.0	0.0	5.0	0.0	0.0	Deficit/excess rainfall	95%	Declined soil fertility	5%
		Use of fertilisers	Use of organic manure	Timely sowing	No specific measures					
4	Method adapted to maintain production	15.8	52.6	0.0	31.6	0.0	Use of organic manure	53%	No specific measures	32%
		Maize monocrop	Soybean monocrop	Cotton monocrop	Mixed cropping	Hangadi				
5	Better performing cropping system for grain production	30.8	0.0	3.8	34.6	30.8	Mixed cropping	35%	Maize monocrop	31%
6	Better performing cropping system for fodder production	15.4	0.0	0.0	46.2	38.5	Mixed cropping	46%	Hangadi	38%
7	Better performing cropping system for quality production stability	26.9	0.0	3.8	26.9	42.3	Hangadi	42%	Maize monocrop	27%

ANNEXURE 5 Germination & Growth

	Questions							Preferred Options and %Share			
		(a)	(b)	(c)	(d)	(e)		1st Preference	%	2nd Preference	%
		More than 80%	60-80%	40-60%	Less than 40%						
1	Percentage germination of Seeds in Kharif	5	18	3	0	0	26	60-80%	69%	More than 80%	19%
		Fast and healthy	Average	Slow	Very poor						
2	Growth Quality Indicators in first 15-20 days	4	14	7	1	0	26	Average	54%	Slow	27%
		Good germination	Some seeds rotted	Delayed germination	No germination						
3	Impact of rainfall on germination	1	22	3	0	0	26	Some seeds rotted	85%	Delayed germination	12%
		No effect	Mild effect	High effect	Entire crop affected						
4	Pest Pest/disease effect during early growth	8	15	3	0	0	26	Mild effect	58%	No effect	31%
		Traditional seed treatment	Chemical seed treatment	Organic/ biological treatment	No treatment						
5	Measures adopt to improve germination	2	0	5	15	0	22	No treatment	68%	Organic/ biological treatment	23%
		Maize monocrop	Soybean monocrop	Cotton monocrop	Mixed cropping	Hangadi					
6	Germination Performance	7	0	0	3	10	20	Hangadi	50%	Maize monocrop	35%
7	Adverse impact of weather on growth	3	8	1	2	10	24	Hangadi	42%	Soybean monocrop	33%
8	Resilience against pests and diseases	5	0	1	5	12	23	Hangadi	52%	Maize monocrop	22%

	Questions							Preferred Options and %Share			
		(a)	(b)	(c)	(d)	(e)		1st Preference	%	2nd Preference	%
		More than 80%	60-80%	40-60%	Less than 40%						
1	Percentage germination of Seeds in Kharif	19.2	69.2	11.5	0.0	0.0	100	60-80%	69%	More than 80%	19%
		Fast and healthy	Average	Slow	Very poor						
2	Growth Quality Indicators in first 15-20 days	15.4	53.8	26.9	3.8	0.0	100	Average	54%	Slow	27%
		Good germination	Some seeds rotted	Delayed germination	No germination						
3	Impact of rainfall on germination	3.8	84.6	11.5	0.0	0.0	100	Some seeds rotted	85%	Delayed germination	12%
		No effect	Mild effect	High effect	Entire crop affected						
4	Pest Pest/disease effect during early growth	30.8	57.7	11.5	0.0	0.0	100	Mild effect	58%	No effect	31%
		Traditional seed treatment	Chemical seed treatment	Organic/ biological treatment	No treatment						
5	Measures adopt to improve germination	9.1	0.0	22.7	68.2	0.0	100	No treatment	68%	Organic/ biological treatment	23%
		Maize monocrop	Soybean monocrop	Cotton monocrop	Mixed cropping	Hangadi					
6	Germination Performance	35.0	0.0	0.0	15.0	50.0	100	Hangadi	50%	Maize monocrop	35%
7	No negative impact of weather on growth	12.5	33.3	4.2	8.3	41.7	100	Hangadi	42%	Soybean monocrop	33%
8	Resilience against pests and diseases	21.7	0.0	4.3	21.7	52.2	100	Hangadi	52%	Maize monocrop	22%

	Aspects						Preferred Options and % Share				
		a	b	C	d	e	1st Preference	%	2nd Preference	%	
		Adequate	Limited	Very little	Not available						
1	Availability of Pulses	4	6	14	2	0	26	Very little	54%	Limited	23%
		Regular and adequate	Sometimes	Very rarely	Not at all						
2	Frequency of availability of vegetables/greens from own sources	16	7	3	0	0	26	Regular and adequate	62%	Sometimes	27%
		Adequate	Limited	Very little	Not available						
3	Availability of milk and milk products	9	12	5	0	0	26	Limited	46%	Adequate	35%
		Very good	Good	Average	Poor						
4	Diverse of Nutritional Diet	8	7	10	1	0	26	Average	38%	Very good	31%
		Very high	Somewhat high	Similar to normal	Did not need to buy						
5	Market Dependency for food items this year	1	14	11	0	0	26	Somewhat high	54%	Similar to normal	42%
		Maize monocrop	Soybean monocrop	Cotton monocrop	Mixed cropping	Hangadi					
6	Availability status of food (grains, pulses, vegetables)	3	0	0	8	15	26	Hangadi	58%	Mixed cropping	31%
		Maize monocrop	Soybean monocrop	Cotton monocrop	Mixed cropping	Hangadi					
7	Minimum Market dependent Farming	1	1	0	8	16	26	Hangadi	62%	Mixed cropping	31%

	Aspects						Preferred Options and %Share				
		a	b	C	d	e	1st Preference	%	2nd Preference	%	
		Adequate	Limited	Very little	Not available	0					
1	Availability of Pulses		23.1	53.8	7.7	0.0	84.6154	Very little	54%	Limited	23%
3	Availability of milk and milk products	34.6	46.2	19.2	0.0	0.0	100	Limited	46%	Adequate	35%
2	Availability of vegetables from own sources	61.5	26.9	11.5	0.0	0.0	100	Regular and adequate	62%	Sometimes	27%
		Very good	Good	Average	Poor	0					
4	Diverse of Nutritional Diet	30.8	26.9	38.5	3.8	0.0	100	Average	38%	Very good	31%
		Very high	Somewhat high	Similar to normal	Did not need to buy	0					
5	Market Dependency for food items this year	3.8	53.8	42.3	0.0	0.0	100	Somewhat high	54%	Similar to normal	42%
		Maize monocrop	Soybean monocrop	Cotton monocrop	Mixed cropping	Hangadi					
6	Availability status of food (grains, pulses, vegetables)	11.5	0.0	0.0	30.8	57.7	100	Hangadi	58%	Mixed cropping	31%
7	Minimum Market dependent	3.8	3.8	0.0	30.8	61.5	100	Hangadi	62%	Mixed	31%

ANNEXURE 7 Cost & Income

	Questions							Preferred Options and %Share			
		(a)	(b)	(c)	(d)	(e)		1st Preference	%	2nd Preference	%
		Very low/Zero	Similar to last year	Higher than last year	Lower than last year						
1	Total cultivation costs this year	2	2	20	2	0	26	Higher than last year	77%	Very low	8%
2	Changes in seed costs	0	3	22	1	0	26	Higher than last year	85%	Similar to last year	12%
3	Costs of manure/fertilisers	2	11	10	3	0	26	Normal	42%	Higher than last year	38%
4	Expenses on pesticides/fungicides	1	12	10	3	0	26	Normal	46%	Higher than last year	38%
5	Expenses on human labour in farming	1	2	22	1	0	26	High	85%	Normal	8%
		Maize monocrop	Soybean monocrop	Cotton monocrop	Mixed cropping	Hangadi	0				
6	In which cropping system were costs the lowest?	8	3	0	4	11	26	Hangadi	42%	Maize monocrop	31%
7	In which cropping system was cash income the highest?	9	7	3	5	2	26	Maize monocrop	35%	Soybean monocrop	27%
8	In which cropping system was dependence on the market the highest?	4	22	0	0	0	26	Soybean monocrop	85%	Maize monocrop	15%

	Questions							Preferred Options and %Share			
		(a)	(b)	(c)	(d)	(e)		1st Preference	%	2nd Preference	%
		Very low/Zero	Similar to last year	Higher than last year	Lower than last year						
1	Total cultivation costs this year	8%	8%	77%	8%	0		Higher than last year	77%	Very low	8%
2	Changes in seed costs	0%	12%	85%	4%	0		Higher than last year	85%	Similar to last year	12%
3	Costs of manure/fertilisers	8%	42%	38%	12%	0		Normal	42%	Higher than last year	38%
4	Expenses on pesticides/fungicides	4%	46%	38%	12%	0		Normal	46%	Higher than last year	38%
5	Expenses on human labour in farming	4%	8%	85%	4%	0		High	85%	Normal	8%
		Maize monocrop	Soybean monocrop	Cotton monocrop	Mixed cropping	Hangadi					
6	Lowest Cost	30.77	11.54	0.00	15.38	42.31		Hangadi	42%	Maize monocrop	31%
7	Highest Cash Income	34.62	26.92	11.54	19.23	7.69		Maize monocrop	35%	Soybean monocrop	27%
8	Most market dependence	15.38	84.62	0.00	0.00	0.00		Soybean monocrop	85%	Maize monocrop	15%

ANNEXURE 8 LS and Financial State

	Questions	a	b	c	d	Preferred Options and %Share			
		Crop cultivation	Dairy/ livestock rearing	Wage labour/ other occupations	Government schemes	1st Preference	%	2nd Preference	%
1	Main Source of income for the household	7	0	5	0	Crop cultivation	58%	Wage labour / other occupations	42%
		Crop failure	Water scarcity	Human resources	Market/marketing				
2	Biggest challenge in maintaining livelihood	12	4	2	4	Crop failure	100%	Water scarcity	0%
		Introduced new crops	Increased livestock rearing	Adopted improved agricultural technologies	Did nothing				
3	Farmer's steps to increase income	9	0	0	12	Did nothing	57%	Introduced new crops	43%

	Question	Crop cultivation	Dairy/ livestock rearing	Wage labour/ other occupations	Government schemes
1	Main Source of income for the household	58.3	0.0	41.7	0.0
		Crop failure	Water scarcity	Human resources	Market/marketing
2	Biggest challenge in maintaining livelihood	54.5	18.2	9.1	18.2
		Introduced new crops	Increased livestock rearing	Adopted improved agricultural technologies	Did nothing
3	Farmer's steps to increase income	42.9	0.0	0.0	57.1

ANNEXURE 9 Climate Change Responses

	Questions						Preferred Options and %Share			
		(a)	(b)	(c)	(d)	(e)	1st Preference	%	2nd Preference	%
		Normal	Slightly abnormal	Very abnormal	Extreme					
1	Farmers understanding about the weather conditions of 2025	0	6	19	1	0	Very abnormal	73 %	Slightly abnormal	23 %
		Always	Often	Sometimes	Never					
2	Farmers reliance on climate information (weather forecast)	3	8	15	0	0	Sometimes	58 %	Often	31 %
		Very positively	Somewhat positively	Somewhat negatively	Very negatively					
3	Climate change effect type on cash Income	0%	0%	46%	54%	0	Very negatively	54 %	Somewhat negatively	46 %
		Maize monocrop	Soybean monocrop	Cotton monocrop	Mixed cropping	Hangani				
4	Cropping system safest under changing weather conditions	8	0	1	4	13	Hangani	50 %	Maize monocrop	31 %
5	Cropping system facing Highest losses under drought / excessive rainfall	4	22	0	0	0	Soybean monocrop	85 %	Maize monocrop	15 %
6	Cropping system that farmers have better adaptation measures	6	12	0	7	1	Soybean monocrop	46 %	Mixed cropping	27 %

	Particulars	Maize monocrop	Soybean monocrop	Cotton monocrop	Mixed cropping	Hangani				
	Changing weather conditions : Safe System	30.8	0.0	3.8	15.4	50.0	Hangani	0.5	Maize monocrop	0.3
	Higher Risk System under drought / excessive rainfall	15.4	84.6	0.0	0.0	0.0	Soybean monocrop	0.9	Maize monocrop	0.2
	System with better adaptation measures	23.1	46.2	0.0	26.9	3.8	Soybean monocrop	0.5	Mixed cropping	0.3

ANNEXURE 10 Suggestions

	Questions	(a)	(b)	(c)	(d)
		Proper use of seeds and fertilisers	Pest/disease management	Water conservation and irrigation techniques	Marketing and sales
1	Important training need to increase production	7	0	0	1
2		Adopt new crops	Expand livestock or dairy	(Adopt organic/sustainable farming	Take up other occupations/wage labour
	Farmers choice to increase income from fields	6	1	3	0
3		Drought / excess-rainfall tolerant seeds	Water conservation and drip irrigation technology	Weather forecasts and early warnings	Training and information
	Farmers support need for climate-resilient agriculture	3	0	2	6
	Aspects	Proper use of seeds and fertilisers	Pest/disease management	Water management	Marketing and sales
	Important training needs to increase production	87.5	0	0	12.5
		Adopt new crops	Expand livestock & dairy	Sustainable farming	Alternate occupations/ wage labour
	Farmers choice to increase income from fields	40	10	30	20
		Drought / excess-rain tolerant crops	Weather forecasts and early warnings	Training and information	
	Support need for climate-resilient agriculture	27.3	18.2	54.5	

		Maize monocrop	Soybean monocrop	Cotton monocrop	(Mixed cropping)	Hangadi
WCC	Due to long and irregular gaps in rainfall, which cropping system was most affected?	17.39	78.26	0.00	0.00	4.35
LP	Cropping system faced maximum difficulty due to excessive rain	20.00	75.00	0.00	0.00	5.00
LP	System Gave better results in the delayed sowing situation	28.00	0.00	0.00	20.00	52.00
CP	Based on current benefits : Priority System	7.69	0.00	0.00	46.15	46.15
CP	Cropping system with better long-term production stability	15.38	3.85	3.85	26.92	50.00
CP	Cash Income based Profitable System	23.08	30.77	7.69	26.92	11.54
Pro	Better performing cropping system for grain production	30.77	0.00	3.85	34.62	30.77
Pro	Better performing cropping system for fodder production	15.38	0.00	0.00	46.15	38.46
Pro	Better performing cropping system for quality production stability	26.92	0.00	3.85	26.92	42.31
Ger	Germination Performance	35.00	0.00	0.00	15.00	50.00
Ger	No negative impact of weather on growth	12.50	33.33	4.17	8.33	41.67
Ger	Resilience against pests and diseases	21.74	0.00	4.35	21.74	52.17

1st Preference	Marks	2nd Preference	Marks
Soybean monocrop	78%	Maize monocrop	17%
Soybean monocrop	75%	Maize monocrop	20%
Hangadi	52%	Maize monocrop	28%
Mixed cropping	46%	Mixed cropping	46%
Hangadi	50%	Mixed cropping	27%
Soybean monocrop	31%	Mixed cropping	27%
Mixed cropping	35%	Maize monocrop	31%
Mixed cropping	46%	Hangadi	38%
Hangadi	42%	Maize monocrop	27%
Hangadi	50%	Maize monocrop	35%
Hangadi	42%	Soybean monocrop	33%
Hangadi	52%	Maize monocrop	22%

Nut	Availability status of food (grains, pulses, vegetables)	11.54	0.00	0.00	30.77	57.69
Nut	Minimum Market dependent Farming	3.85	3.85	0.00	30.77	61.54
C & I	Lowest Cost	30.77	11.54	0.00	15.38	42.31
C & I	Highest Cash Income	34.62	26.92	11.54	19.23	7.69
C & I	Most market dependence	15.38	84.62	0.00	0.00	0.00
CS	Changing weather conditions : Safe System	30.77	0.00	3.85	15.38	50.00
CS	Higher Risk System under drought / excessive rainfall	15.38	84.62	0.00	0.00	0.00
CS	System with better adaptation measures	23.08	46.15	0.00	26.92	3.85

Hangadi	58%	Mixed cropping	31%
Hangadi	62%	Mixed cropping	31%
Hangadi	42%	Maize monocrop	31%
Maize monocrop	35%	Soybean monocrop	27%
Soybean monocrop	85%	Maize monocrop	15%
Hangani	50%	Maize monocrop	31%
Soybean monocrop	85%	Maize monocrop	15%
Soybean monocrop	46%	Mixed cropping	27%

	Aspects	1st Preference	Perc ent	2nd Preference	Perc ent
WCC	Due to long and irregular gaps in rainfall, which cropping system was most affected?	Soybean monocrop	78%	Maize monocrop	17%
LP	Cropping system faced maximum difficulty due excessive rain	Soybean monocrop	75%	Maize monocrop	20%
LP	System Gave better results in the delayed sowing situation	Hangadi	52%	Maize monocrop	28%
CP	Based on current benefits : Priority System	Mixed cropping	46%	Mixed cropping	46%
CP	Cropping system with better long-term production stability	Hangadi	50%	Mixed cropping	27%

	1st Preference	2nd Preference	Joint
Soyabean Monocropping	4	2	6
Maize Monocropping	1	9	10
Mixed Farming	3	6	9
Hangadi	10	1	11

CP	Cash Income based Profitable System	Soybean monocrop	31%	Mixed cropping	27%
Pr o	Better performing cropping system for grain production	Mixed cropping	35%	Maize monocrop	31%
Pr o	Better performing cropping system for fodder production	Mixed cropping	46%	Hangadi	38%
Pr o	Better performing cropping system for quality production stability	Hangadi	42%	Maize monocrop	27%
Ge r	Germination Performance	Hangadi	50%	Maize monocrop	35%
Ge r	No negative impact of weather on growth	Hangadi	42%	Soybean monocrop	33%
Ge r	Resilience against pests and diseases	Hangadi	52%	Maize monocrop	22%
Nu t	Availability status of food (grains, pulses, vegetables)	Hangadi	58%	Mixed cropping	31%
Nu t	Minimum Market dependent Farming	Hangadi	62%	Mixed cropping	31%
C &I	Lowest Cost	Hangadi	42%	Maize monocrop	31%
C &I	Highest Cash Income	Maize monocrop	35%	Soybean monocrop	27%
C &I	Most market dependence	Soybean monocrop	85%	Maize monocrop	15%
CS	Changing weather conditions : Safe System	Hangani	50%	Maize monocrop	31%
CS	Higher Risk System under drought / excessive rainfall	Soybean monocrop	85%	Maize monocrop	15%
CS	System with better adaptation measures	Soybean monocrop	46%	Mixed cropping	27%

Cotton Cropping	0	0	0
	18	18	36

	1st Preference	2nd Preference	Joint
Soyabean Monocropping	22.22	11.11	16.67
Maize Monocropping	5.56	50.00	27.78
Mixed Farming	16.67	33.33	25.00
Hangadi	55.56	5.56	30.56
Cotton Cropping	0.00	0.00	0.00

One

Questions	Total FGD (26 Villages)					RJ (20 Villages)					MP (4 Villages)					GJ (2 Villages)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
7. Due to long and irregular gaps in rainfall, which cropping system was most affected?	17 %	78 %	0%	0%	4%	17 %	78 %	0 %	0%	6%	0%	100 %	0%	0%	0%	50%	50%	0 %	0%	0%

Two

Questions	Total FGD (26 Villages)					RJ (20 Villages)					MP (4 Villages)					GJ (2 Villages)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
4. Due to delayed or excessive rainfall, in which cropping system did you face maximum difficulty?	20 %	75 %	0%	0%	5%	19 %	75 %	0 %	0%	6%	0%	100 %	0%	0%	0%	50%	50%	0 %	0%	0%
5. When sowing was delayed, which system gave the best results?	28 %	0%	0%	20 %	52 %	32 %	0%	0 %	11 %	58 %	25 %	0%	0%	25 %	50%	0%	0%	0 %	100 %	0%

Three

Questions	Total (26 Villages)					RJ (20 Villages)					MP (4 Villages)					GJ (2 Villages)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
6. In terms of germination, which cropping system performed best?	35 %	0%	0%	15 %	50 %	38 %	0%	0 %	13 %	50 %	0%	0%	0%	0%	####	50%	0%	0 %	50%	0%
7. In which system was the adverse impact of weather on early growth the least?	13 %	33 %	4%	8%	42 %	11 %	42 %	0 %	5%	42 %	0%	0%	33%	0%	67%	50%	0%	0 %	50%	0%
8. Which cropping system proved most resilient against pests and diseases?	22 %	0%	4%	22 %	52 %	22 %	0%	6 %	22 %	50 %	0%	0%	0%	0%	100 %	50%	0%	0 %	50%	0%

Four

Questions	Total (26 Villages)					RJ (20 Villages)					MP (4 Villages)					GJ (2 Villages)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
6. Based on current benefits, which system will you priorities in future?	8%	0%	0%	46 %	46 %	10 %	0%	0 %	40 %	50 %	0%	0%	0%	50 %	50%	0%	0%	0 %	100 %	0%
7. In which cropping system has long-term production stability been higher?	15 %	4%	4%	27 %	50 %	15 %	5%	5 %	25 %	50 %	0%	0%	0%	25 %	75%	50%	0%	0 %	50%	0%
8. From the point of view of cash income, which system has been most profitable?	23 %	31 %	8%	27 %	12 %	25 %	30 %	5 %	30 %	10 %	0%	50%	25%	0%	25%	50%	0%	0 %	50%	0%

Five

Questions	Total (26 Villages)					RJ (20 Villages)					MP (4 Villages)					GJ (2 Villages)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
5. In which cropping system was grain production the highest?	31 %	0%	4%	35 %	31 %	30 %	0%	5 %	35 %	30 %	0%	0%	0%	50 %	50%	100 %	0%	0 %	0%	0%
6. In which cropping system was fodder production the best?	15 %	0%	0%	46 %	38 %	15 %	0%	0 %	45 %	40 %	0%	0%	0%	50 %	50%	50%	0%	0 %	50%	0%
7. In which cropping system was the quality of production most stable?	27 %	0%	4%	27 %	42 %	25 %	0%	5 %	25 %	45 %	0%	0%	0%	50 %	50%	100 %	0%	0 %	0%	0%

Six

Questions	Total (26 Villages)					RJ (20 Villages)					MP (4 Villages)					GJ (2 Villages)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
6. From which cropping system was the availability of food (grains, pulses, vegetables) the best?	12 %	0%	0%	31 %	58 %	10 %	0%	0 %	25 %	65 %	0%	0%	0%	50 %	50%	50%	0%	0 %	50%	0%
7. In which system was dependence on the market minimal?	4%	4%	0%	31 %	62 %	5%	5%	0 %	25 %	65 %	0%	0%	0%	25 %	75%	0%	0%	0 %	100 %	0%

Seven

Questions	Total (26 Villages)					RJ (20 Villages)					MP (4 Villages)					GJ (2 Villages)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
6. In which cropping system were costs the lowest?	31 %	12 %	0%	15 %	42 %	30 %	15 %	0 %	10 %	45 %	0%	0%	0%	50 %	50%	####	0%	0 %	0%	0%
7. In which cropping system was cash income the highest?	35 %	27 %	12 %	19 %	8%	40 %	25 %	5 %	25 %	5%	0%	50%	50%	0%	0%	50%	0%	0 %	0%	50%
8. In which cropping system was dependence on the market the highest?	15 %	85 %	0%	0%	0%	20 %	80 %	0 %	0%	0%	0%	100 %	0%	0%	0%	0%	100 %	0 %	0%	0%

Nine

Questions	Total (26 Villages)					RJ (20 Villages)					MP (4 Villages)					GJ (2 Villages)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
4. Which cropping system has been safest under changing weather conditions?	31 %	0%	4%	15 %	50 %	30 %	0%	0 %	15 %	55 %	0%	0%	25%	25 %	50%	100 %	0%	0 %	0%	0%
5. In which cropping system were losses highest under drought / excessive rainfall?	15 %	85 %	0%	0%	0%	20 %	80 %	0 %	0%	0%	0%	10	100 %	0%	0%	0%	100 %	0 %	0%	0%
6. In response to climate change, in which cropping system have farmers adopted more adaptation measures?	23 %	46 %	0%	27 %	4%	20 %	50 %	0 %	25 %	5%	25 %	50%	0%	25 %	0%	50%	0%	0 %	50%	0%

Appendix 1

Survey Performa of Phase-1

बुवाई एवं अंकुरण की स्थिति पर तुरत सर्वेक्षण

जिला	ब्लाक	गाँव	पंचायत
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1. गाँव में अभी कितने प्रतिशत भूमि पर खरीफ़ फसल है – चुने

- a. 10% से कम
- b. 10% से अधिक परन्तु 25% से कम
- c. 26% से अधिक परन्तु 50% से कम
- d. 50% से अधिक परन्तु 75% से कम
- e. 75 % से अधिक

2. इस वर्ष गाँव की खरीफ़ फसल में कौन सा तरीका सबसे अधिक है (सबसे अधिक को एक नंबर – सबसे कम को 7 नंबर)

- a. कपास एकल
- b. सोयाबीन एकल
- c. मक्का एकल
- d. सोयाबीन+मक्का
- e. कपास+मक्का
- f. मक्का+तुअर
- g. हांगणि

3. खरीफ़ फसल में कौन सी फसल की स्थिति सबसे अच्छी है (सबसे अधिक को एक नंबर – सबसे कम को 7 नंबर)

- a. कपास एकल
- b. सोयाबीन एकल
- c. मक्का एकल
- d. सोयाबीन+मक्का
- e. कपास+मक्का
- f. मक्का+तुअर
- g. हांगणि

Appendix 2:

Performance for Phase-2 FGD

1 1. Weather and Climate Change

In this year, when did the rains begin?

- (a) On time
- (b) 15 days later than normal
- (c) 1 month later than normal
- (d) Earlier than normal

2

How was the total amount of rainfall?

- (a) More than normal
- (b) Less than normal
- (c) About normal
- (d) Irregular

3

What was the impact of temperature during the entire monsoon season?

- (a) Normal
- (b) Too hot
- (c) Too cool
- (d) Kept changing frequently

4

What was the effect of wind and storms on your crops?

- (a) No effect
- (b) Leaves/flowers dropped
- (c) Crop lodged/fell down
- (d) Entire crop affected

5

In which month were conditions most difficult for crops?

- (a) June
- (b) July
- (c) August
- (d) September

6

How did weather uncertainty affect your crop planning?

- (a) Sowing on time
- (b) Delayed sowing
- (c) Changed crop
- (d) Could not sow at all

- 7 Due to long and irregular gaps in rainfall, which cropping system was most affected?
- (a) Maize monocrop
 - (b) Soybean monocrop
 - (c) Cotton monocrop
 - (d) Mixed cropping
 - (e) Hangani

2. Land Preparation and Sowing

- 1 On what proportion of land could Kharif crops not be sown this year?
- (a) Less than 10%
 - (b) 10–25%
 - (c) 25–50%
 - (d) 50–75%
 - (e) More than 75%
- 2 What was the soil moisture status at the time of sowing?
- (a) Adequate moisture
 - (b) Excessive moisture
 - (c) Very low/dry soil
 - (d) Field waterlogged
- 3 What was your main source of seed for sowing?
- (a) Only own traditional/local seed
 - (b) Partly own local seed and partly purchased
 - (c) Taken from neighbors
 - (d) Entirely purchased from the market
- 4 Due to delayed or excessive rainfall, in which cropping system did you face maximum difficulty?
- (a) Maize monocrop
 - (b) Soybean monocrop
 - (c) Cotton monocrop
 - (d) Mixed cropping
 - (e) Hangani

- 5 When sowing was delayed, which system gave the best results?
- (a) Maize monocrop
 - (b) Soybean monocrop
 - (c) Cotton monocrop
 - (d) Mixed cropping
 - (e) Hangani
- 6 Under irregular and untimely rainfall, what problems did you face and in which cropping system? (Open response)

3. Germination and Early Growth

- 1 What percentage of Kharif seeds germinated this year?
- (a) More than 80%
 - (b) 60–80%
 - (c) 40–60%
 - (d) Less than 40%
- 2 How was crop growth during the first 15–20 days?
- (a) Fast and healthy
 - (b) Average
 - (c) Slow
 - (d) Very poor
- 3 What was the impact of rainfall on germination?
- (a) Good germination
 - (b) Some seeds rotted.
 - (c) Delayed germination
 - (d) No germination
- 4 Was there any pest/disease effect during early growth?
- (a) No effect
 - (b) Mild effect
 - (c) High effect
 - (d) Entire crop affected
- 5 What measures did you adopt to improve germination?
- (a) Traditional seed treatment
 - (b) Chemical seed treatment
 - (c) Organic/biological treatment
 - (d) No treatment

- 6 In terms of germination, which cropping system performed best?
- (a) Maize monocrop
 - (b) Soybean monocrop
 - (c) Cotton monocrop
 - (d) Mixed cropping
 - (e) Hangani
- 7 In which system was the adverse impact of weather on early growth the least?
- (a) Maize monocrop
 - (b) Soybean monocrop
 - (c) Cotton monocrop
 - (d) Mixed cropping
 - (e) Hangani
- 8 Which cropping system proved most resilient against pests and diseases?
- (a) Maize monocrop
 - (b) Soybean monocrop
 - (c) Cotton monocrop
 - (d) Mixed cropping
 - (e) Hangani

4. Cropping Pattern

- 1 Which type of farming system did you follow this year?
- (a) Monocropping
 - (b) Mixed cropping
 - (c) Hangani
 - (d) All of the above
- 2 If you practiced monocropping, how was your experience?
- (a) Good production
 - (b) Average production
 - (c) Low production
 - (d) No production at all
- 3 If you practised mixed cropping, what benefits did you observe?
- (a) Reduced incidence of pests and diseases
 - (b) Maintained soil fertility
 - (c) Higher production
 - (d) No benefit

- 4 If you practised hangani farming, what benefits did your family gain?
- (a) Dietary diversity / improved nutrition
 - (b) Reduced dependence on market
 - (c) Higher cash income
 - (d) Increased biodiversity
- 5 Along with your existing farming, what new crop or system did you try?
- (a) Millets/coarse cereals
 - (b) Hangani farming
 - (c) Monocropping
 - (d) Commercial crops
- 6 Based on current benefits, which system will you prioritise in future?
- (a) Maize monocrop
 - (b) Soybean monocrop
 - (c) Cotton monocrop
 - (d) Mixed cropping
 - (e) Hangani
- 7 In which cropping system has long-term production stability been higher?
- (a) Maize monocrop
 - (b) Soybean monocrop
 - (c) Cotton monocrop
 - (d) Mixed cropping
 - (e) Hangani
- 8 From the point of view of cash income, which system has been most profitable?
- (a) Maize monocrop
 - (b) Soybean monocrop
 - (c) Cotton monocrop
 - (d) Mixed cropping
 - (e) Hangani

5. Production

- 1 How was grain production this year?
- (a) Higher than normal
 - (b) Normal
 - (c) Lower than normal
 - (d) Very low or total crop failure

- 2 How was fodder production in this Kharif season?
- (a) Adequate
 - (b) Average
 - (c) Low
 - (d) Not available at all
- 3 What was the main reason for low production?
- (a) Deficit/excess rainfall
 - (b) Pests/diseases
 - (c) Declined soil fertility
 - (d) Other:
- 4 What methods did you adopt to increase production?
- (a) Use of fertilizers
 - (b) Use of organic manure
 - (c) Timely sowing
 - (d) No specific measures
- 5 In which cropping system was grain production the highest?
- (a) Maize monocrop
 - (b) Soybean monocrop
 - (c) Cotton monocrop
 - (d) Mixed cropping
 - (e) Hangani
- 6 In which cropping system was fodder production the best?
- (a) Maize monocrop
 - (b) Soybean monocrop
 - (c) Cotton monocrop
 - (d) Mixed cropping
 - (e) Hangani
- 7 In which cropping system was the quality of production most stable?
- (a) Maize monocrop
 - (b) Soybean monocrop
 - (c) Cotton monocrop
 - (d) Mixed cropping
 - (e) Hangani

6. Nutrition and Food Security

- 1 What was the availability of pulses for your family?
 - (a) Adequate
 - (b) Limited
 - (c) Very little
 - (d) Not available

- 2 How often were vegetables/greens available from your own sources?
 - (a) Regular and adequate
 - (b) Sometimes
 - (c) Very rarely
 - (d) Not at all

- 3 How was the availability of milk and milk products?
 - (a) Adequate
 - (b) Limited
 - (c) Very little
 - (d) Not available

- 4 In terms of nutrition, how diverse was your family's diet?
 - (a) Very good
 - (b) Good
 - (c) Average
 - (d) Poor

- 5 How dependent was your family on the market for food items this year?
 - (a) Very high
 - (b) Somewhat high
 - (c) Similar to normal
 - (d) Did not need to buy

- 6 From which cropping system was the availability of food (grains, pulses, vegetables) the best?
 - (a) Maize monocrop
 - (b) Soybean monocrop
 - (c) Cotton monocrop
 - (d) Mixed cropping
 - (e) Hangan

- 7 In which system was dependence on the market minimal?
- (a) Maize monocrop
 - (b) Soybean monocrop
 - (c) Cotton monocrop
 - (d) Mixed cropping
 - (e) Hangani

7. Cost and Income

- 1 How were the total cultivation costs this year?
- (a) Very low / negligible
 - (b) Similar to last year
 - (c) Higher than last year
 - (d) Lower than last year
- 2 What change did you see in seed costs?
- (a) Zero
 - (b) Similar to last year
 - (c) Higher than last year
 - (d) Lower than last year
- 3 How were the costs of manure/fertilizers?
- (a) Zero
 - (b) Normal
 - (c) Higher than normal
 - (d) Lower than normal
- 4 How were expenses on pesticides/fungicides?
- (a) Zero
 - (b) Normal
 - (c) Higher than normal
 - (d) Lower than normal
- 5 How were expenses on human labour in farming?
- (a) Very low
 - (b) Normal
 - (c) High
 - (d) Very high

- 6 In which cropping system were costs the lowest?
 - (a) Maize monocrop
 - (b) Soybean monocrop
 - (c) Cotton monocrop
 - (d) Mixed cropping
 - (e) Hangani

- 7 In which cropping system was cash income the highest?
 - (a) Maize monocrop
 - (b) Soybean monocrop
 - (c) Cotton monocrop
 - (d) Mixed cropping
 - (e) Hangani

- 8 In which cropping system was dependence on the market the highest?
 - (a) Maize monocrop
 - (b) Soybean monocrop
 - (c) Cotton monocrop
 - (d) Mixed cropping
 - (e) Hangani

- 9 Did you apply improved "Ukeda" manure on your fields this year? If yes, in which season did you use it? (Open response)

- 10 What were the main effects of using this improved Ukeda manure on soil health, fertility, cultivation costs, crop production, and nutrition? (Open response)

8. Livelihood and Financial Status

- 1 What was the main source of income for the household?
 - (a) Crop cultivation
 - (b) Dairy/livestock rearing
 - (c) Wage labor/other occupations
 - (d) Government schemes

- 2 What was the biggest challenge in maintaining livelihood?
 - (a) Crop failure
 - (b) Water scarcity
 - (c) Human resources
 - (d) Market/marketing
- 3 What steps did the farmer take to increase income?
 - (a) Introduced new crops
 - (b) Increased livestock rearing
 - (c) Adopted improved agricultural technologies
 - (d) Did nothing

9. Climate Change and Farmer Response

- 1 How would you describe the weather conditions this year?
 - (a) Normal
 - (b) Slightly abnormal
 - (c) Very abnormal
 - (d) Extreme
- 2 How often do farmers rely on climate information (weather forecast)?
 - (a) Always
 - (b) Often
 - (c) Sometimes
 - (d) Never
- 3 How has climate change affected farm cash income?
 - (a) Very positively
 - (b) Somewhat positively
 - (c) Somewhat negatively
 - (d) Very negatively
- 4 Which cropping system has been safest under changing weather conditions?
 - (a) Maize monocrop
 - (b) Soybean monocrop
 - (c) Cotton monocrop
 - (d) Mixed cropping
 - (e) Hangan

- 5 In which cropping system were losses highest under drought / excessive rainfall?
- (a) Maize monocrop
 - (b) Soybean monocrop
 - (c) Cotton monocrop
 - (d) Mixed cropping
 - (e) Hangani
- 6 In response to climate change, in which cropping system have farmers adopted more adaptation measures?
- (a) Maize monocrop
 - (b) Soybean monocrop
 - (c) Cotton monocrop
 - (d) Mixed cropping
 - (e) Hangani

10. Suggestions

- 1 In the farmer's view, which training is most important for increasing crop production?
- (a) Proper use of seeds and fertilizers
 - (b) Pest/disease management
 - (c) Water conservation and irrigation techniques
 - (d) Marketing and sales
- 2 What would farmers like to do to increase income from their fields?
- (a) Adopt new crops
 - (b) Expand livestock or dairy
 - (c) Adopt organic/sustainable farming
 - (d) Take up other occupations/wage labor
- 3 What support do farmers need for climate-resilient agriculture?
- (a) Drought/excess-rainfall-tolerant seeds
 - (b) Water conservation and drip irrigation technology
 - (c) Weather forecasts and early warnings
 - (d) Training and information
- 4 In your opinion, considering the current situation, which farming system is the most beneficial? (Open response)

- 5 Why do you consider this system beneficial? (Open response)
- 6 What key changes do you want to make in farming to cope with climate change? (Open response)
- 7 What is your opinion about traditional farming practices? Should farmers follow traditional methods or adopt new technologies? (Open response)
- 8 At present, what kind of farmer-friendly schemes would you like from the government or any governmental/non-governmental organisation? (Open response)
- 9 What is the level of interest of youth in your family in the farming you are currently practising? (Open response)

Any other suggestions: (Open response)

FGD Survey Report as per phase 1

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सागवाडा	पोरनिचा	कुशासनद	दोहाबसत	उमरगट	> 75%	1	1	1	1	3	2	7	1	1	2	3	1	1	2	3	6	1
सागवाडा	अमलनपुर्	कुशासनद	अमलनपुर्	उमरगट	> 75%	2	2	2	1	4	3	2	2	2	2	1	5	3	2	1	3	2
सागवाडा	दिमोड बहा	कुशासनद	अमरगट	अमरगट	> 75%	7	7	3	7	5	8	3	7	2	2	6	3	6	3	6	3	3
सागवाडा	पोरनिचा	कुशासनद	बागुली	बागुली	> 75%	4	5	4	2	2	4	1	5	3	5	4	1	2	1	1	2	1
सागवाडा	अमलनपुर्	कुशासनद	अमलनपुर्	कोरडीचा	> 75%	7	4	3	6	3	7	2	7	6	5	6	6	5	2	1	1	1
सागवाडा	अमलनपुर्	कुशासनद	अमलनपुर्	कोरडीचा	> 75%	7	6	5	4	6	4	2	7	6	5	6	5	6	1	1	1	1
सागवाडा	दिमोड बहा	कुशासनद	फिकली	फिकली	> 75%	2	1	3	2	2	3	3	2	2	2	2	2	2	2	3	2	3
सागवाडा	अमलनपुर्	कुशासनद	रामगड	मोगमजवट	> 75%	7	6	1	2	1	3	7	7	7	7	3	6	2	7	7	7	7
सागवाडा	अमलनपुर्	कुशासनद	रामगड	मोगमजवट	> 75%	6	1	1	1	1	1	7	7	7	6	5	6	6	7	7	7	7
सागवाडा	भीकवजो	उज्जैनगड	जिवा बसवरा सि	तोडनिचा जमोड	50% to 75%	2	6	4	2	7	7	4	2	7	6	7	6	7	4	1	1	1
सागवाडा	भीकवजो	उज्जैनगड	मोगमजवट	भुमरी	50% to 75%	2	2	3	3	4	5	1	7	7	5	7	7	6	2	1	1	1
सागवाडा	जामबेरा	उज्जैनगड	मोगमजवट	मोगमजवट	50% to 75%	7	5	1	6	5	4	1	7	7	1	4	5	1	1	1	1	1
सागवाडा	कावारवाडी	उज्जैनगड	मोगमजवट	पोरनिचा बहा	50% to 75%	7	5	5	5	5	5	7	4	5	4	3	4	5	1	1	1	1
सागवाडा	भीकवजो	उज्जैनगड	गड धमराज	भुमरी पाडा	50% to 75%	7	5	3	7	2	6	2	7	6	5	7	2	7	2	7	2	7
सागवाडा	भीकवजो	उज्जैनगड	बुदनी हाता	बुदनी हाता	50% to 75%	7	1	1	1	2	2	4	7	6	1	3	4	3	4	3	4	3
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	4	3	4	2	3	2	1	4	3	2	1	3	1	1	1	1	1
सागवाडा	दिमोड बहा	कुशासनद	पारकजि	पारकजि	50% to 75%	3	3	3	3	1	3	3	2	3	2	3	1	3	3	3	3	3
सागवाडा	अमलनपुर्	कुशासनद	रामगड	मोगमजवट	50% to 75%	2	3	2	2	2	3	3	2	3	2	2	2	2	2	3	2	3
सागवाडा	दिमोड बहा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	3	1	2	1	2	3	2	3	2	3	1	3	3	3	3	3
सागवाडा	पोरनिचा	कुशासनद	फिकली	फिकली	50% to 75%	1	2	2	1	3	3	3	1	1	1	2	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा	कुशासनद	मोगमजवट	मोगमजवट	50% to 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
सागवाडा	पोरनिचा																					



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