# PERCEPTION OF FARMERS ON DIGITAL ADVISORY SERVICES


**Report Submitted to**

NABARD

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**Submitted by**

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# TABLE OF CONTENTS

# EXECUTIVE SUMMARY

*As part of the Indo-German Bilateral Cooperation, NABARD is associated with the implementation of project 'Integration of Watershed Development for Rehabilitation of Degraded Soils and Climate Change Adaptation' in collaboration with KfW. MANAGE has been identified as the National Consortium Facilitating Agency (NCFA) for the implementation of ICT enabled advisory services in the project areas of KfW. NABARD and MANAGE have agreed to work jointly to implement the innovative ICT enabled advisory platform "NICE System", already created under GIZ ProSoil project for implementation in the KfW Soil project areas of Andhra Pradesh, Chhattisgarh, Karnataka, Odisha and Telangana to offer quality advisory services to the farmers. KfW-NABARD supported initiative for providing an ICT based agro-advisory platform in five states covering 24560 farmers in 122 watershed villages of 31 districts.*

*The overall objective of this proposed project is to create and disseminate localized, timely and quality content around climate change adaptation in the agriculture sector using an ICT based Platform called "Network for information on Climate (EX) change (NICE)". As one of the major interventions of the project, an open source web solution termed Network for Information on Climate Exchange (NICE) was designed. NICE facilitates gathering and dissemination of up-to-date, customized and relevant information to the farmers, allowing existing multiple knowledge stakeholders from domains like meteorology, agriculture science, extension systems and others to share and adapt knowledge across multiple subject domains, to address local needs.*

*The information provided through the interventions covered a wide range of topics right from production to marketing. It is found that the programme has been successful in addressing the needs and requirements of the farming families in the selected villages or the watersheds. This is seen in their ratings on the Provision of Knowledge and information on Crop Management Practices and Provision of Market Information. The effect of this change is reflected through the perceptions of the farmers on the economic impact of the programme.*

*The study has concluded that the farmers are very satisfied with the information provided by the NICE services relating to the markets viz., cost of inputs, market price for agricultural produce etc. This has helped them in marketing their products and thus fetch better price. Farmers have also expressed satisfaction relating to the relevance of the messages, timeliness of the messages, understandability of messages, the treatment provided to the messages etc., This is found to have been translated into enhancing the knowledge levels, initiating changes in the agricultural practices and thus, obtain enhanced agricultural incomes through improved productivity and accessibilities.*

*It is interesting to note that there are psychological and economic impacts as a result of the programme. These are found to be to a great extent mutually inclusive, yet psychological aspects are influencing the other aspects. Thus, the future programmes could aim at enhancing the psychological impacts, before it can expect increased economic impacts which perhaps is found to be very much 'auto'.*

*The programme may attempt at involving all those involved in the commissioning and maintenance of the network services. It is suggested that the present programme could be extended to larger areas in collaboration with existing extension functionary working in the states like ATMA and extension officers working with line departments.*

# LIST OF TABLES

# LIST OF ILLUSTRATIONS



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# 1. INTRODUCTION

Information and communication technologies are key enablers of globalization. They allow for the efficient and cost-effective flow of information, products, people and capital across national and regional boundaries. ICT is not a panacea for rural development problems, but it has the potential to help the rural poor to leap some of the traditional barriers to development, by improving access to information, expanding the market base, enhancing employment opportunities and making government services work better (Swanson & Rajalathi, 2010).

Information plays a key role in agricultural development and production and their effective communication will help to facilitate mutual understanding among farmers, agricultural scientists and extension workers (Agboola, 2000). According to Kaye (1995) good information improves decision-making, enhances efficiency and provides a competitive edge. Knowledge and information are basic ingredients for increased agricultural production and productivity. Information is a critical resource in the operation and management of the agricultural enterprise.

According to Nagasri, (2000); Aizaki, Nakashima, Ujie, Takeshita & Tahara,(2010), all agricultural extension and farmer programs face major challenges which are ensuring cost effective outreach, designing solutions tailored to needs of individual farmers and cultivating an image that is farmer friendly. Any change in technology, the economic impact of ICT occurs through improvements in efficiency and increasing productivity. This can take place in different ways including improving efficiency in resource allocation, reducing transaction costs, and technical improvements that result in an outward shifting of the production function. In particular, through the provision of information from a source that is relatively affordable, accessible and broadly available, ICT can contribute to the reduction of uncertainty in activities and transactions, reduce the extent to which markets are thin, missing or incomplete, and reduce the extent to which information asymmetries can be exploited by the relatively informed to extract rent when transacting with the relatively uninformed.

For many farmers, useful information about optimal practices and inputs for their farms might be hard to obtain. Generating information for one's own farm through self-experimentation might be too costly or difficult. For example, the cost of conducting soil tests or setting up experimental plots can be high. Moreover, individuals may not know along which dimensions to experiment (Hanna et al. 2014) or their perceptions may have limited correspondence with actual soil quality (Marenya et al. 2008; Berazneva et al. 2016). Learning may be further hampered by noise due to exogenous shocks, such as variable rainfall patterns.

Public agricultural extension services have played a key role in creating and disseminating local agricultural knowledge to farmers. However, while many developing country governments spend heavily on agricultural extension, the evidence on the impacts of these services is mixed (Anderson and Feder 2007; Benin et al. 2007; Davis et al. 2012). Narrow farmer reach, weak accountability and persistent funding difficulties can hinder traditional public extension services. In other contexts, there is limited evidence on the effectiveness of training lead farmers and relying on them to spread agronomic messages to others (Kondylis et al. 2017).

Climate change has made crop and the crop seasons very uncertain and this is more aggravated with the lack of information on weather, inputs, crop management practices, market prices, etc. Further, farming is mostly done by tenant farmers today with uncertainty of ploughing the same land the next year. Thus, anticipating more returns from the land without its proper management. At this point of time, the government is promoting the concept of doubling of farmer's income among the various stakeholders of the extension system.

Today, transfer of technology in the extension system is done by multiple service providers including both public and private institutions responding to the multifaceted demands, problems and needs of the farmers. Agricultural extension is becoming pluralistic with different actors concurrently using different and diverse extension approaches and methods. But one can never forget the role played by the public extension system in attaining self-reliance in food production in green revolution. The important revolutions in agricultural development in India namely, green revolution, yellow revolution, white revolution, blue revolution, golden revolution, etc would not have been possible without the interventions of the public extension system. Similarly even for doubling of farmer's income also the public extension system has a lead role to play.

MANAGE is also a public sector organization working for the welfare of farmers and the farming community. It has always served the farming community for its betterment. The motto behind serving famers is to aid them in their development and in improving their farm income and now it is working towards doubling of the farmer's income.

## 1.1 Background

### NABARD-KFW Soil Project (Integration of Watershed Development for Rehabilitation of Degraded Soils and Climate Change Adaptation)

As part of the Indo-German Bilateral Cooperation, NABARD is associated with the implementation of the project in partnership with KfW. MANAGE has been identified as a National

Consortium Facilitating Agency for implementation of ICT enabled advisory services in the project areas of KfW. Both organisations have agreed to work jointly to implement the innovative ICT enabled advisory platform "NICE System", already created under GiZ ProSoil project for implementation in the KfW Soil project areas of Andhra Pradesh, Chhattisgarh, Karnataka, Odisha and Telangana to offer quality advisory services to the farmers. This project envisages to implement ICT based agro-advisory platform in five states covering 24560 farmers in 122 watershed villages of 31 districts.

The overall objective of this proposed project is to create and disseminate localized, timely and quality content around climate change adaptation in the agriculture sector using an ICT based Platform called "Network for information on Climate (EX) change (NICE)". The specific objectives of the project are to:

1. Establish network of expert institutions like SAUs, KVKs, IMD etc. to provide localized and validated advisories to farmers.
2. Ensure farmers get up-to-date advisories based on local farming systems and related weather forecasts, to enable them to take timely corrective measures.
3. Establish a two-way flow of communication to generate and exchange localized, quality content on agriculture.
4. Capacity building of stakeholders to better understand specific local needs around the farmer develop advisories and responds to farmer queries.

### 1.1.1 Key Strategies of the project

1. Leveraging diverse expertise
2. Integration of existing agriculture knowledge systems
3. Strengthen and build on the existing agricultural extension systems
4. Increase efficiency in promoting climate resilient agriculture and promote active participation and engagement of farming communities.

As one of the major interventions of the project, an open source web solution termed Network for Information on Climate Exchange (NICE) was designed. NICE facilitates gathering and dissemination of up-to-date, customized and relevant information to the farmers, allowing the existing multiple knowledge stakeholders from domains like meteorology, agriculture science, extension systems and others to share and adapt knowledge across multiple subject domains, to address local needs.

The system was iterative in nature and allows a multimodal approach, enabling two-way communication to link farmers' needs and knowledge providers, on a real-time basis. In addition, the project works on institutional systems, revitalizes existing extension systems, capacities of experts and monitoring systems for effective development, dissemination and adoption of relevant advisories by farmers.

A repository containing the farmers details covering the basic demographics to detailed cropping pattern were captured with the help of NGOs and other project personnel .The content created was disseminated through SMS of 160-164 characters, videos capturing peer farmers' practices, visibility materials such as posters and one-pagers, voice messages, through field agents, social media etc.. Recently the WhatsApp dissemination feature was added in the system.


Fig 1: Overview of NICE services

## 1.2 The NICE system

The NICE (Network for Information on Climate Exchange) System is a web-based open source platform (https://nicessm.org/ ) that allows a multimode approach and enables two-way communication to link farmers' needs to knowledge experts on a real time basis. The farmers receive the advisories in the form of mobile SMS.

### 1.2.1 Features of NICE System

- Each farmer is treated as exceptional, implying that every farmer enrolled in the system is treated individually, soil details and cropping details would be known to the system and hence messages related to the soil condition on his farm or messages on the crops he is growing are only sent to him.
- Each farmer can forward queries individually for his crops and he will receive replies on his mobile individually
- Extensive content repository is developed and can be used by any registered user.
- Any registered user can create content for any location, language or knowledge domain.
- Strong reporting tool to analyse data at every level of project implementation.
- The field agents also use tablets to disseminate advisories (Posers, Video URLs and Expert advice) to farmers thereby creating a more personal link.
- NICE has some remarkable features for successful collation, validation and dissemination of advisory information.
- The modular structure of NICE allows a peer-review mechanism from content aggregation, expert validation and subsequent translation and dissemination of the content.
- The NICE system has facility to capture the farmer's basic and socio-economic details including, land details, crops grown for the season etc.

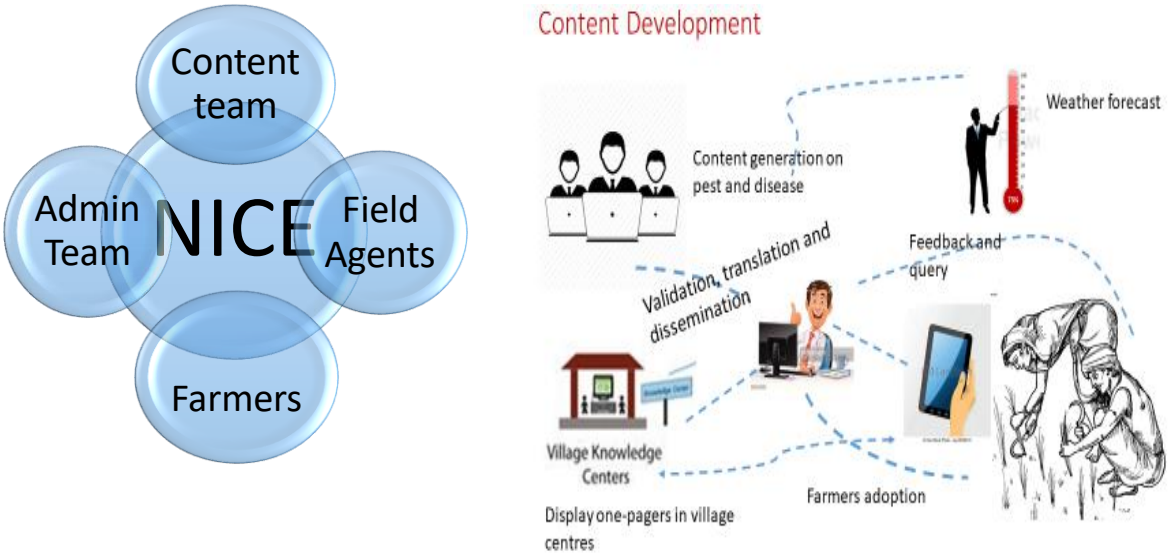



**Fig 2: components of NICE system**

### 1.2.2 Role of cluster resource persons

- Obstructions in extension services like Language, Network connectivity will be solved.
- Connectivity with the farmers to get constant support
- Bridge between content & admin team and farmers
- Access to the Information like SMS, Poster, video URL's, one pager etc., developed for their region.
- NICE app is loaded on to the Tab/ Mobile of CRP's which enables them to access content uploaded on NICE web based platform.

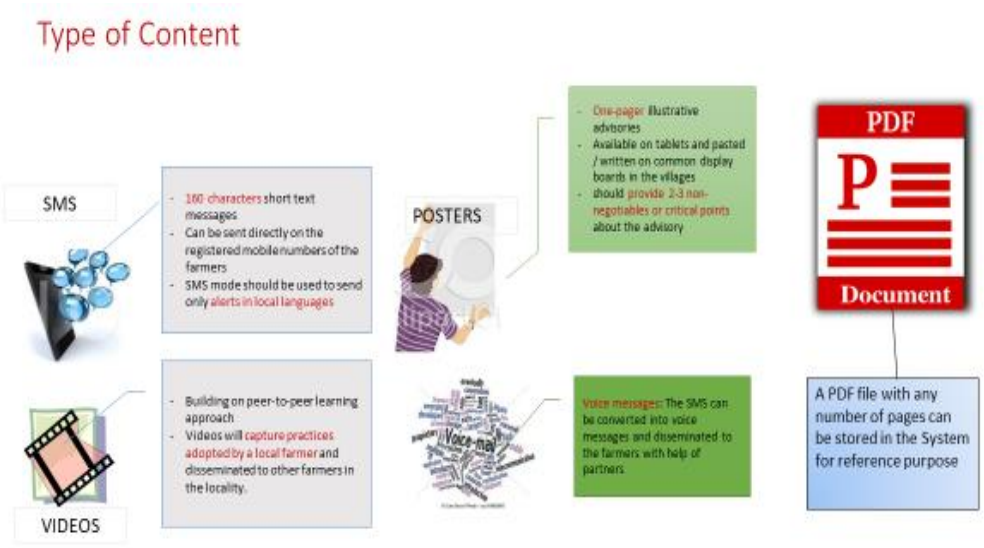



**Fig 3: Types of content**

## 1.3 Interventions and theory of change

In this section, we discuss the hypothesized role of NICE Agro-Advisory Services (NAAS) in improving the farmer's knowledge and change in the productivity.

**A theory of change for agricultural extension**

Low rates of adoption in developing countries have been well documented and there is widespread theoretical and empirical literature identifying the determinants of agricultural technology adoption in different contexts (Conley and Udry 2010; Duflo et al. 2011; Feder et al. 1985; Foster and Rosenzweig 1995; Suri 2011).

There is an extensive literature documenting the determinants of agricultural technology adoption in developing country contexts (see, for instance, Jack 2011 and Foster and Rosenzweig 2010). In this study, we explore the role of information in the adoption process, in particular the role that

agricultural extension services play in addressing knowledge gaps using NICE agro advisory services. Birkhaeuser and others (1991) propose a simple theory of change for the impact of extension services on the adoption of new technologies. Figure 1 builds on their general framework.

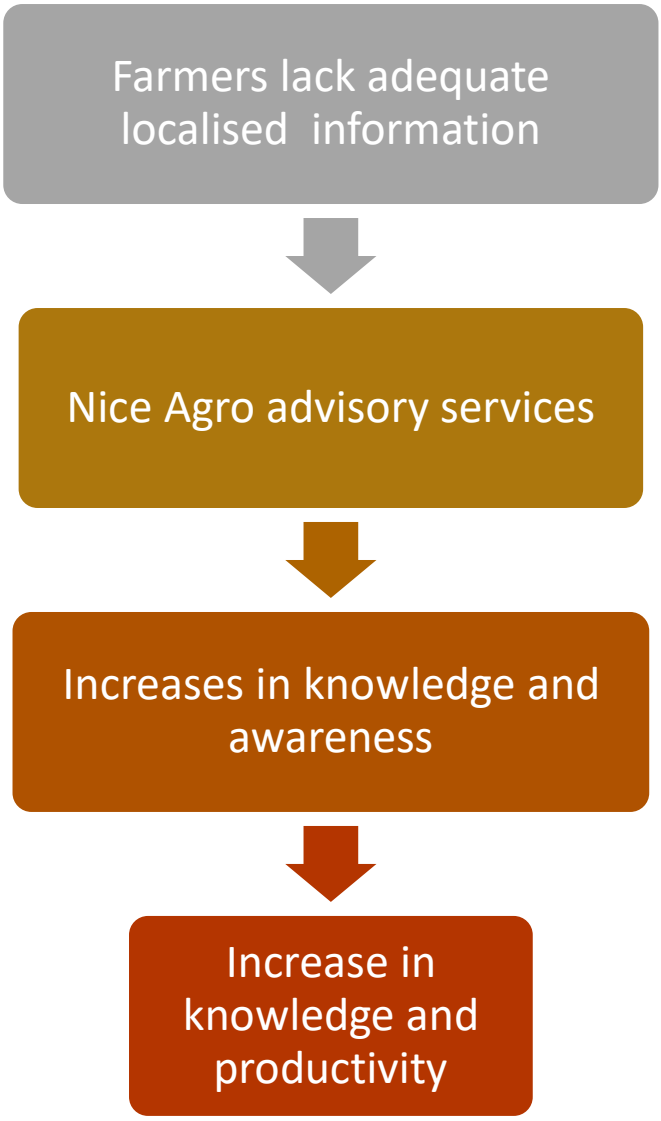



**Figure 4 : Theory of change**

The theory of change predicts that NICE agro advisory services will solve underlying needs by providing farmers with information that will close those knowledge gaps. The information provided in both interventions covered a wide range of topics right from production to marketing.

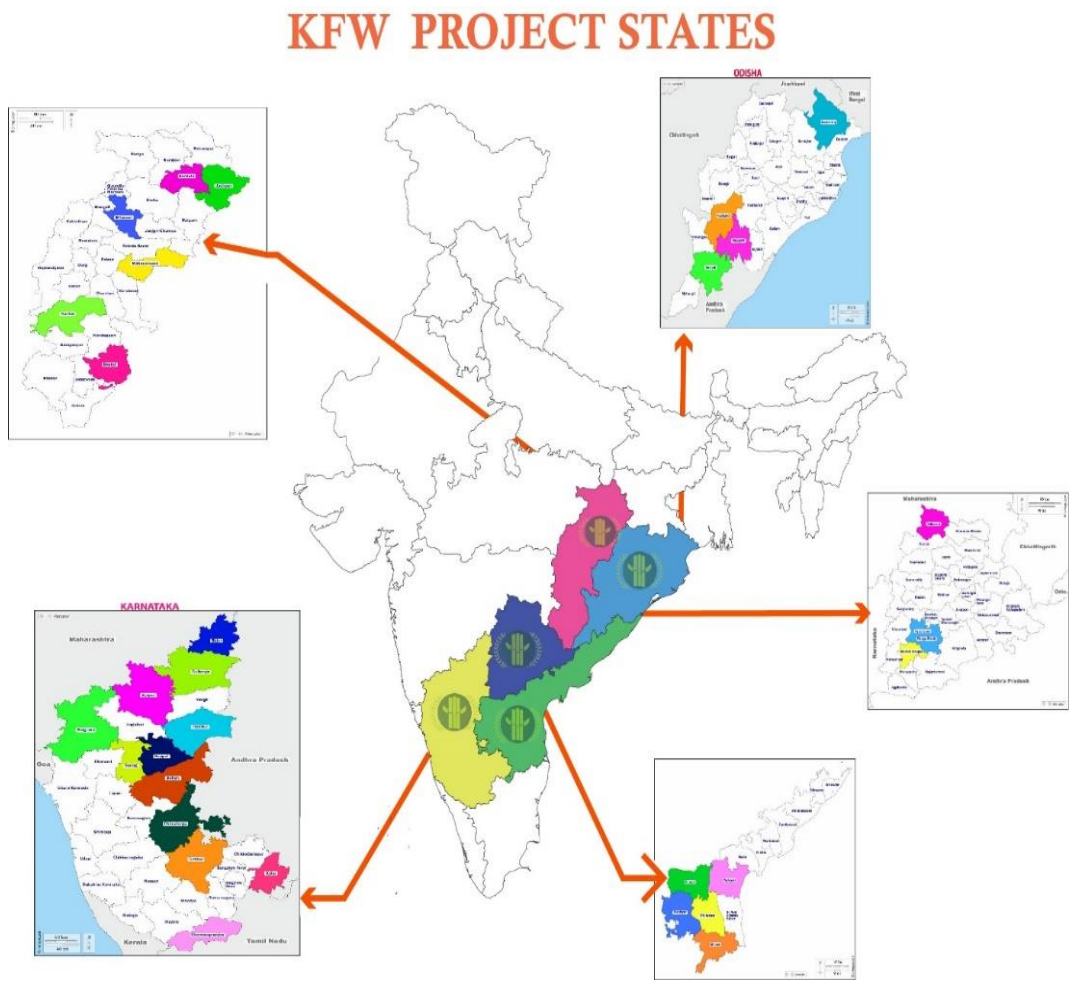



Figure 5 : Kfw soil project states

## 1.4 .Farming scenario, Agro ecological conditions and cropping system in project states

**Andhra Pradesh**

Andhra Pradesh is “the bejeweled rice bowl of India". Agriculture is the chief source of income to the State's economy. Andhra Pradesh is agrarian in character, and it is considered as one of the most progressive States with respect of agriculture development, maintaining high levels of crop production compared to several other States. Paddy, Maize, cotton, Jowar, other millets and horticultural crops are the majorly grown crops in the state.

**Chhattisgarh**

Chhattisgarh is a state in Central India. The entire state has been divided into three agro-climatic zones viz., Bastar plateau, Chhattisgarh plains and Northern hills. About 80 percent of the

population in the state is engaged in agriculture and 43 percent of the entire arable land is under cultivation. Paddy, Wheat Maize and Gram are the majorly grown crops in the region.

**Karnataka**

Karnataka has 10 Agro-climatic zones with rich crop diversity and five major soil types. Average size of holding is 1.55 ha. There are seven river basins in Karnataka, formed by the Krishna, Cauvery, Godavari, West flowing rivers, North Pennar, South Pennar & Palar. Ragi, Green gram, Groundnut, Onion, Cotton, Red gram, Chilly, Finger millet, Jowar, Bengal Gram, Wheat, Tomato, Pomegranate, Coconut, Arecanut, Mango, Banana were the majorly grown crops.

**Odisha**

Agriculture in Odisha is characterized by low productivity on account of various factors. These factors include problematic soil (acidic, saline & waterlogged), lack of assured irrigation, low seed replacement rate, low level of fertilizer. Rice is the main crop of the State. Maize & Ragi are the important coarse cereals. Arhar, moong, biri, kulthi, gram, field pea, cowpea, and lentil are the pulse crops. Groundnut, sesamum, castor, mustard, Niger, sunflower, safflower, soybean, linseed are the Oilseed crops grown in the State.

**Telangana**

Telangana State is endowed with bountiful resources having fertile soils, diversified cropping pattern and major irrigation systems fed by rivers such as the Godavari and the Krishna. Agriculture is a way of life, a tradition that has shaped the culture and economic life of the people of Telangana. Paddy, maize, Cotton, Soybean, Red gram, Jowar, millets, vegetables, and other horticulture crops were majorly grown in this state.

## 1.5 Advisory services using NICE Platform

Advisory is prepared on the major crops grown in the project areas based on issues identified during the season and diagnostic field visits. Based on the interaction with farmers, a multimodal advisory includes SMS, Video URL's, Posters and documents were prepared and disseminated to the farmers through the niceSSM portal. Crop bulletins covering all the aspects of production, protection and post-harvest were prepared and published in local language which will be distributed to CRP's in both hard and soft copies to use as a ready resource to provide necessary advisory to the farmers in future. MANAGE has published several videos in its YouTube channel on several aspects of farming. These video URL's and other video URL's developed by state agricultural universities were also shared with CRP's through niceSSM portal. Crop posters were printed in colour by CRP's according to the cropping stage and pasted at Village Knowledge

Centres and the places where farmers gather for their works. District Agro Advisory Services bulletins published by IMD twice a week were also shared with CRP's through niceSSM portal. In addition to the above, with reference to the regular field problems based on the farmer's feedback, query and SAUs the need based posters were prepared on real time problems and disseminated to farmers.

The details of advisory disseminated state wise and content type is shown in the following table.

| S.No. | State | SMS | Video URLs | Posters | Documents | Total |
|---|---|---|---|---|---|---|
| 1 | Telangana | 486 | 68 | 257 | 197 | 1445364 |
| 2 | Andhra Pradesh | 519 | 26 | 15 | 271 | 3036150 |
| 3 | Karnataka | 856 | 749 | 484 | 991 | 7608128 |
| 4 | Chhattisgarh | 1025 | 278 | 380 | 553 | 3535225 |
| 5 | Odisha | 547 | 571 | 282 | 306 | 3199950 |
| | Total | **3433** | **1692** | **1418** | **2318** | **18824817** |

**Table 1. Total Advisories disseminated during the project period in KFW**

The above Table shows the number of advisories disseminated during the project implementation period in KfW project. It can be visualized from the table that a conspicuous amount/number of advisories are found in Karnataka followed by Chhattisgarh and Andhra Pradesh. The plausible reason could be due to more number of farmers found in these districts. A total of 3433 SMS, 1692 Video URLs, 1418 Posters, 2318 documents were disseminated to farmers in the project. The total messages received in all formats are about 188.24 lakhs.

# 2. RESEARCH METHODOLOGY

## 2.1. **Objectives of the study**

1. To assess the perception of farmers on the digital advisory services using NICE System on improving transfer of agricultural knowledge, skills for adopting better farming practices.
2. To ascertain the constraints faced by the farmers & feedback of farmers on the digital advisory services.

In this study, we evaluate the impact of Nice Agro advisory services used in KfW Soil project in improving the adoption of recommended agricultural practices and increasing adoption of locally relevant agricultural technologies in KfW project area. This is a comprehensive and representative assessment in which we study how these interventions changed farmers' reported knowledge about the recommended practices.


Figure 6 : Timeline of the project

## 2.2. Sample Design

The KfW Soil project is operational in five states reaching nearly 24560 farmers, spread across 122 watershed villages of 31 districts in five states viz. Andhra Pradesh, Chhattisgarh, Karnataka, Odisha and Telangana of India. The NICE advisory was disseminated on regular basis to the farmers on various issues related to crop cultivation, pesticides, weather, marketing etc. The

responses of farmers are collected to access the perception of farmers on NICE advisory services in the project. The details of survey design and data collection process is explained in the following sections.

## 2.3. Sampling Technique

The study adopted stratified random sampling technique for the purpose of sample selection. A stratified sample is a probability sampling technique that is appropriate to use to obtain a sample population that best represents the entire population being studied. To minimize sample selection bias and ensured that all the segments of the population are covered in the study.

## 2.4. Sample Size

A stratified multistage probability sample technique was adopted for the survey sampling. Districts are the primary sampling units, while farmers are the ultimate stage units. Within each state, a select number of districts (d) were sampled randomly from d/2 number of strata. In each district, a total of 10 watersheds were sampled from the strata, in proportion to the NICE farmers in the district. In each village, for selecting the farmers, purposive random sampling method was followed. Average of 364 farmers were sampled from each state of the project area.

The following formula is used for calculating the sample size for each state

$$\text{Finite population: } n' = \frac{n}{1 + \frac{z^2 \times \hat{p}(1-\hat{p})}{\varepsilon^2 N}}$$

Where

**z** is the z score

**ε** is the margin of error

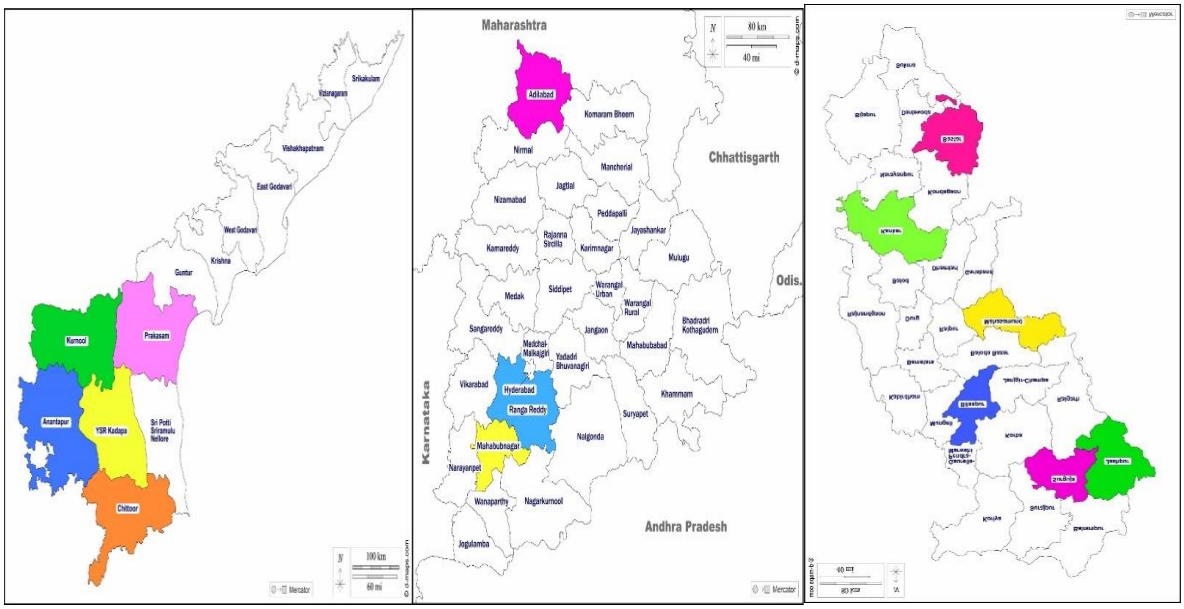
**N** is population size

**p̂** is the population proportion

The study analysis done with 1821 responses, which is > 1742 considered as statistically valid sample.

| S.No | State | No of Farmers | Sample size | Samples collected |
|---|---|---|---|---|
| 1 | Andhra Pradesh | 5926 | 361 | 362 |
| 2 | Chhattisgarh | 3449 | 346 | 398 |
| 3 | Karnataka | 6134 | 363 | 378 |
| 4 | Odisha | 2343 | 331 | 336 |
| 5 | Telangana | 2974 | 341 | 347 |
| | **Total** | 20826 | 1742 | 1821 |

**Table 2 : Details of the Sample size selected from KfW project**



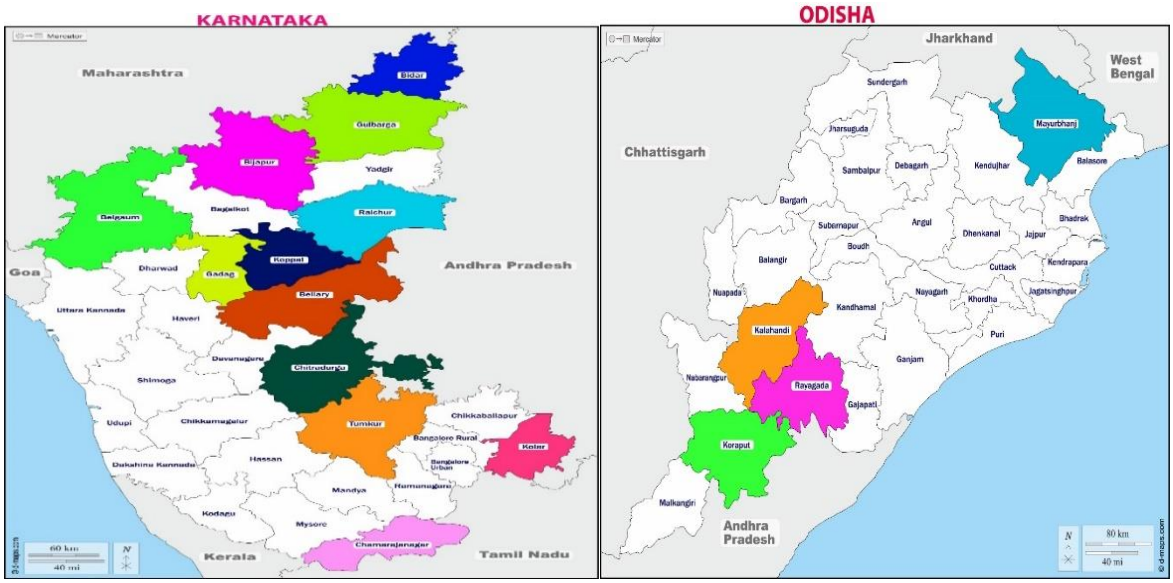



Figure 7: Project districts under each state

## 2.5. **Questionnaire design**

The Questionnaire was designed to capture the perception of farmers on NICE Agro Advisory Services (NAAS). The questionnaire was designed to capture the socio-economic status of the farmers, impact of the NAAS, Satisfaction level, Adoption of the services etc. The following figure depicts the major data on dimensions captured in the study.

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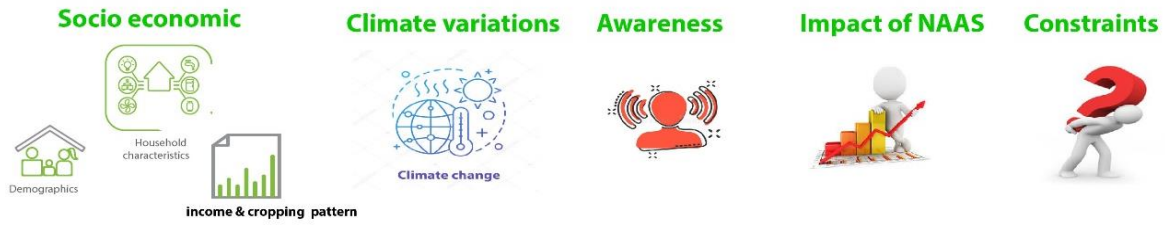



## 2.6. Data Collection

The data used in this study was collected through Assistant Project Field Coordinators and Cluster Resource Persons of the respective states. The data collection was initiated in January 2021 and completed in March 2021. Because of COVID-19, the project team could not visit the villages personally to collect the data. A Google form was designed to capture the questionnaire data by local Field Agents and also over phone by interacting with farmers and recording the data in the Google form. The Google form was developed with all checks and validations to capture good quality data in an easy manner by the investigators. The data rectification and codification has been done to perform analysis on various data sets.

The survey was conducted in 4 Indian languages: Hindi, Kannada, Odiya and Telugu. The questionnaires were administered between January 2021 and March 2021. The average time taken per interview was about 35 minutes.

## 2.7. Data Indicators

Major data indicators were arrived at, keeping in view the objectives and scope of the study. The data indicators primarily intended to capture the quantitative and qualitative impact.

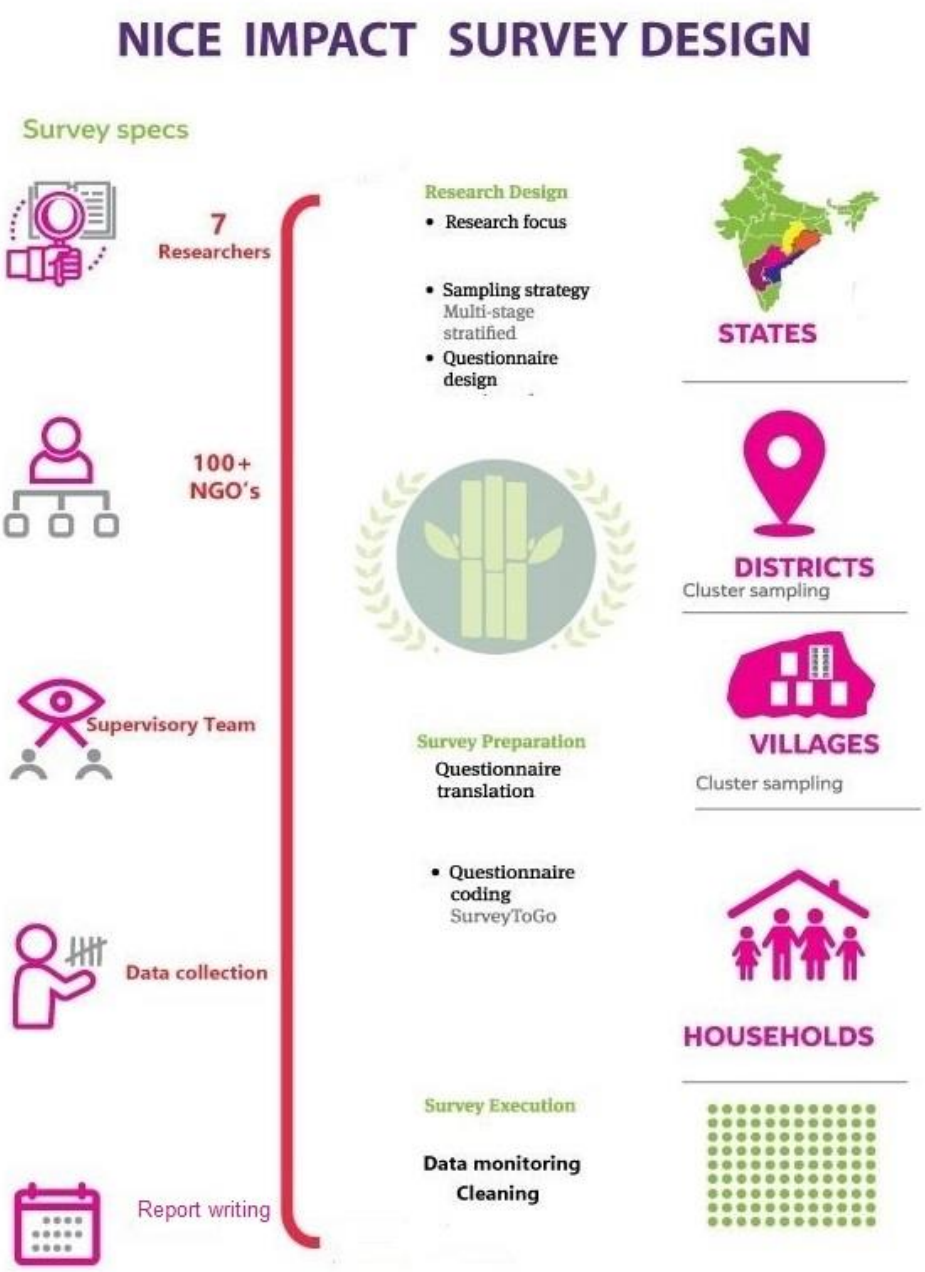



Figure 8: Survey Design

## 2.8. Limitations of the Study

The study was conducted based on the recall ability of the farmers and with a belief that they are honest in providing the information. The study is based on the opinions and perceptions of respondents; hence it may not be free from individual bias and prejudices. In spite of these limitations and constraints, efforts were made to objectively conduct the research and present it in a systematic manner to the possible extent.

# RESULTS AND DISCUSSION

## 3.1 Profile of Respondents (Farmers):

### 3.1.1 Major Crops and Cropping Pattern

Andhra Pradesh is agrarian in character, and it is considered as one of the most progressive States with respect of agriculture development, maintaining high levels of crop production compared to several other States. Paddy, Maize, Cotton, Jowar, other millets and horticultural crops are the majorly grown crops in the state.

Chhattisgarh state has been divided in to three agro-climatic zones viz., Bastar plateau, Chhattisgarh plains and Northern hills. About 80 percent of the population in the state is engaged in agriculture and 43 percent of the entire arable land is under cultivation. Paddy, Wheat Maize and Gram are the majorly grown crops in the region.

Karnataka is having ten Agro-climatic zones with rich crop diversity & 5 major soil types. Ragi, Green gram, Groundnut, Onion, Cotton, Red gram, Chilly, Finger millet, Jowar, Bengal Gram, Wheat, Tomato, Pomegranate, Coconut, Arecanut, Mango, Banana were the major crops grown in the state.

Agriculture in Odisha is characterized by low productivity on account of various factors. These factors include problematic soil (acidic, saline & waterlogged), lack of assured irrigation, low seed replacement rate, low level of fertilizer, low level of mechanization etc. Rice is the main crop of the State Maize & Ragi are the important coarse cereals Arhar, moong, biri, kulthi, gram, field pea, cowpea, and lentil are the pulse crops Groundnut, sesamum, castor, mustard, Niger, sunflower, safflower, soybean, linseed are the Oilseed crops grown in the state.

Telangana State is endowed with bountiful resources having fertile soils, diversified cropping pattern and major irrigation systems fed by rivers such as the Godavari and the Krishna. Paddy, maize, Cotton, Soybean, Red gram, Jowar, millets, vegetables, and other horticulture crops were majorly grown in this state.

Paddy is the Major crop cultivated uniformly across the selected states followed by maize and pulses a minor portion of the farmers are seen cultivating the vegetables and minor millets , this might be due to climate and edaphic factors associated, the water availaibility is another factor in deciding the crops , normally khariff season receives excess rainfall when compared to the rabi season hence farmers are opting for paddy.


Figure 9 : Major crops in project area

The study revealed paddy is the dominant crop in the project area owing to the availability of water followed pulses and vegetables, most of the farmers reported they are cultivating crucifers and gourds, they had decent market for the vegetables. Among the vegetables the brinjal and tomato are having highest acreage followed by the crucifers and Cole crops, it is interesting to know that chilies and leafy vegetables has a portion.

### 3.1.2) Demographic Profile of farmers

Among the sample of farmers in the project area, 39.65 per cent belongs to middle age i.e. 36 years to 45 years, followed by 38.39 per cent who are in the 46-55 year age group. About 11. 59 per cent of them are belonging are belonging to 55+ years age group. Thus, most of the farmers belong to either middle aged or slightly older age groups. This is indicative of the continuation of agriculture by these groups.

**Table 3. Distribution of age of the farmers in project states**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana | Total |
|---|---|---|---|---|---|---|
| < 35 years | 48(13.26) | 11(2.76) | 29(7.67) | 82(24.40) | 19(5.48) | 189(10.38) |
| 36-45 | 122(33.70) | 0.00 | 116(30.69) | 144(42.86) | 149(42.94) | 722(39.65) |
| 46-55 | 158(43.65) | 187(46.98) | 126(33.33) | 92(27.38) | 136(39.19) | 699(38.39) |
| > 55 years | 34(9.39) | 9(2.26) | 107(28.31) | 18(5.36) | 43(12.39) | 211(11.59) |
| Total | 362(100) | 398(100) | 378(100) | 336(100) | 347(100) | 1821(100) |

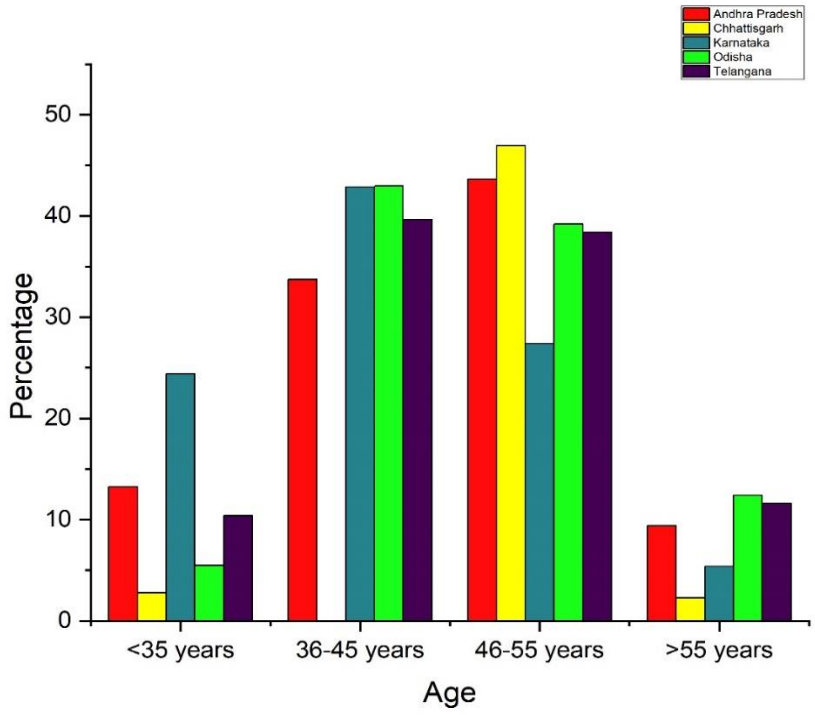



Figure 10 : Distribution of respondents according to their Age

It can be seen that large majority of the respondents across the states are in the age group of 36-45 and 46-55 years. It is the least in Chhattisgarh [46.98%] and highest in Telangana [81.13%]. Odisha state has a relatively higher percentage of farmers in the younger age groups. About 24.40 per cent in Odisha are in the below 35 years age group.

On the other hand in the Karnataka state more than a fourth of them are in the 55 year age group. Thus, the demographic composition of the sample is found to vary marginally across and the same may have a bearing on the different aspects of the programme.

### 3.1.2) Sex Composition

**Table 4 . Sex composition of the farmers in project states**

| Sex | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana | Total |
|---|---|---|---|---|---|---|
| Female | 55 (15.19) | 96 (24.12) | 84 (22.22) | 56 (16.67) | 51 (14.70) | 342 (18.78) |
| Male | 307 (84.81) | 302 (75.88) | 294 (77.78) | 280 (83.33) | 296 (85.30) | 1,479 (81.22) |
| Total | 362 (100) | 398 (100) | 378 (100) | 336 (100) | 347 (100) | 1,821 (100) |

Less than a fifth of the total respondents are female farmers. They account for 18.78 per cent of the total and the remaining are the men. This is reflective of the male dominance in the agricultural sector. Notwithstanding this, it will be interesting to look at the response of these different sex groups across the different states for the programme that is under way. The states of Chhattisgarh and Karnataka have a marginally higher representation of the women than what is found in the other states. In the state of Chhattisgarh they account for 24.12 per cent.

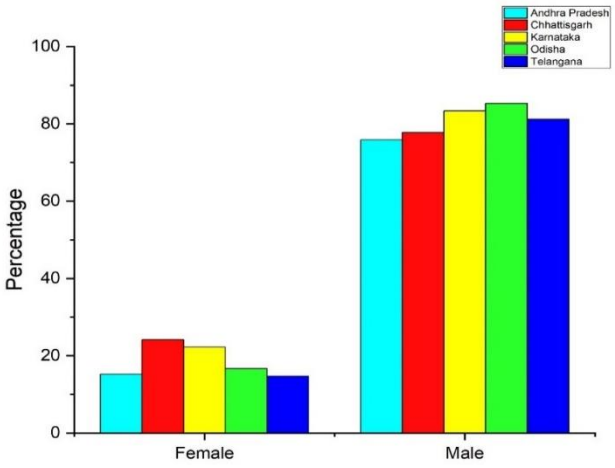



Fig 11. Sex composition

| State | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Below 35 years** | | | | | |
| Female | 15 (27.27) | 3 (3.12) | 8 (9.52) | 17 (30.36) | 5 (9.80) |
| Male | 33 (10.93) | 8 (2.64) | 21 (7.14) | 65 (23.21) | 14 (4.73) |
| **36-45 years** | | | | | |
| Female | 18 (32.72) | 51 (53.12) | 22 (26.10) | 22 (39.29) | 22 (43.14) |
| Male | 104 (34.44) | 140 (46.35) | 94 (31.97) | 122 (43.57) | 127 (42.91) |
| **46-55 years** | | | | | |
| Female | 19 (34.54) | 40 (41.66) | 26 (30.95) | 14 (25) | 16 (31.37) |
| Male | 139 (46.03) | 147 (48.67) | 100 (34.01) | 78 (27.86) | 120 (40.54) |
| **> 55 years** | | | | | |
| Female | 3 (5.45) | 2 (2.08) | 28 (33.33) | 3 (5.36) | 8 (15.69) |
| Male | 31 (10.26) | 7 (2.31) | 79 (26.87) | 15 (5.36) | 35 (11.82) |

| **Total** | | | | | |
|---|---|---|---|---|---|
| Female | 55 (15.19) | 96 (24.12) | 84 (22.22) | 56 (16.67) | 51 (14.70) |
| Male | 307 (84.81) | 302 (75.88) | 294 (77.78) | 280 (83.33) | 296 (85.30) |
| | **362** | **398** | **378** | **336** | **347** |

With a view to help in understanding the participation of the women in agriculture and its bearing on the proposed programme, the sex composition is further analysed across the different age groups [see Table No. 5]. It is found to be varied across the different age groups. Thus, for the 55+ age group it is 2.08 per cent in Chhattisgarh, 5.45 per cent in Andhra Pradesh. However, it is 33.33 per cent in Karnataka state. A similar pattern is evident in the other age group as well. Not with standing this, there is good representation of the women in the different age groups. But it will be interesting to look at their responses to the services provided through the programme.

### 3.1.3) Land holding Held by farmers

The extent of land held by the farmers is found to vary greatly across all the states. In view of the fact that the extent of land held by the farmer has a decisive influence on all his decisions concerning the agriculture, the land holding is categorized into five broad groups [see Table No.6].

It is interesting to note that nearly 50 per cent of the sample respondents have reported to be owning less than 1 ha. of land. Thus, they are owning small patches of land and by and large practicing subsistence agriculture. This aspect is bound to have effects on the nature of the participation under the programme and the expectations as well. The next best represented group is that of the small farmers owning anywhere between 1 to 2 ha. They account for 27.98 per cent of the total farmers. This is followed by those holding between 2 to 4 ha. of land. The representation of these semi-medium farmers is of the order of 12.92 per cent. Large farmers account for only 5.59 per cent. It will be interesting to look at the incomes earned by these different farmers and the relevance of the current programme as well.

**Table No.6 : Distribution of Households by Landholding Held by the Household across States**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Marginal** | 150 (41.44) | 73 (18.34) | 15 (3.97) | 36 (10.71) | 135 (38.90) |
| **Small** | 73 (20.17) | 129 (32.41) | 47 (12.43) | 165 (49.11) | 69 (19.88) |
| **Semi med** | 70 (19.34) | 141 (35.43) | 139 (36.77) | 127 (37.80) | 68 (19.60) |
| **Medium** | 55 (15.19) | 49 (12.31) | 148 (39.15) | 7 (2.08) | 63 (18.16) |
| **Large** | 14 (3.87) | 6 (1.51) | 29 (7.67) | 1 (0.30) | 12 (3.46) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

Of all the states under the NICE agricultural advisory services, state of Karnataka is slightly different from the other states. There is not only a significant percent of marginal farmers i.e. those owning less than an ha. Of land, but almost a good 7 per cent of them are owning large agricultural holdings as well. Notwithstanding this, the small and the semi-medium land holders put together account for more than 60 per cent of the farmers in the states of Chhattisgarh and Odisha. The rest of the farmers are large or medium sized farmers. In the light of this, it will be pertinent to look at the agricultural income accruing to these households in these states.

**Table No.7 : Distribution of Households by Age and Annual Income**

| Age Vs income | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana | Total |
|---|---|---|---|---|---|---|
| **<35 years** | | | | | | |
| **Below 20,000** | 0 | 4 (0.21 ) | 9 ( 0.49) | 0 | 4 (0.21 ) | 17 (0.93 ) |
| **20,000 to 50,000** | 30 (1.64 ) | 2 (0.10) | 6 (0.32 ) | 5 (0.27 ) | 5 (0.27 ) | 48 (2.63 ) |
| **50,001 to 1 lakh** | 2 (0.10) | 0 | 7 (0.38 ) | 77 (4.22 ) | 5 (0.27 ) | 91 (4.99 ) |
| **> 1 lakh** | 16 ( 0.88 ) | 5 (0.27 ) | 7 (0.38 ) | 0 | 5 (0.27 ) | 33 (1.81 ) |
| **Total** | 48(2.63 ) | 11 (0.60) | 29 (1.59 ) | 82 (4.50 ) | 19 (1.04 ) | 189 (10.39 ) |
| **36-45 years** | | | | | | |
| **Below 20,000** | 0 ( ) | 11(0.60 ) | 21(1.15 ) | 0 (0 ) | 1(0.05 ) | 33(1.81) |

| | | | | | | |
|---|---|---|---|---|---|---|
| **20,000 to 50,000** | 70 ( 3.84) | 32 ( 1.76) | 47 ( 2.58) | 8 (0.44 ) | 77 (4.23 ) | 234 (12.85 ) |
| **50,001 to 1 lakh** | 4 ( 0.22) | 74 ( 4.06 ) | 27 ( 1.48 ) | 136 (7.47) | 25 ( 1.37 ) | 266 (14.61 ) |
| **> 1 lakh** | 48 ( 2.64 ) | 74 (4.06 ) | 21 (1.15 ) | 0 (0 ) | 46 ( 2.53 ) | 189 (10.38 ) |
| **Total** | 122 ( 6.69 ) | 191 (10.48 ) | 116 (6.37 ) | 144(7.90 ) | 149 (8.18 ) | 722 (39.64 ) |
| **46-55 years** | | | | | | |
| **Below 20,000** | 0 | 11 (0.60 ) | 31 ( 1.70) | 0 (0 ) | 1 (0.05 ) | 43 (2.36 ) |
| **20,000 to 50,000** | 73 (4.01 ) | 18 (0.99 ) | 61 (3.35 ) | 7 (0.38 ) | 65 (3.57 ) | 224 (12.30 ) |
| **50,001 to 1 lakh** | 6 (0.33 ) | 107 (5.88 ) | 16 ( 0.88 ) | 85 (4.67 ) | 39 (2.14 ) | 253 (13.89 ) |
| **> 1 lakh** | 79 (4.34 ) | 51 (2.80 ) | 18 (0.99 ) | 0 (0 ) | 31 (1.70 ) | 179 (9.83 ) |
| **Total** | 158 ( 8.67 ) | 187 ( 10.26 ) | 126 ( 6.91 ) | 92 ( 5.05) | 136( 7.46 ) | 699 ( 38.39) |
| **55+ years** | | | | | | |
| **Below 20,000** | 0 | 2 ( 0.11 ) | 22 (1.21 ) | 0 (0 ) | 4 (0.22 ) | 28 (1.54 ) |
| **20,000 to 50,000** | 6 ( 0.33 ) | 0 ( ) | 39 (2.14 ) | 2 (0.11 ) | 22 (1.21 ) | 69 (3.79) |
| **50,001 to 1 lakh** | 1 (0.05 ) | 5 (0.27 ) | 28 (1.54 ) | 16 (0.88 ) | 10 (0.55 ) | 60 (3.29 ) |
| **> 1 lakh** | 27 ( 1.48 ) | 2 (0.11 ) | 18 (0.99 ) | 0 (0 ) | 7 ( 0.38 ) | 54 (2.97 ) |
| **Total** | 34 ( 1.87 ) | 9 (0.49) | 107 ( 5.87 ) | 18 ( 0.98 ) | 43 ( 2.36 | 211 ( 11.58) |

The above table gave insight on the income distribution across different age groups .In the 36-45 years category in Andhra Pradesh, 3.84 per cent of the farmers have reported an income of below 50,000, while 2.64 per cent are reported to be earning more than 1 lakh. The same is true of Telangana as well. In Karnataka, in the same age group the percentage of those earning more than 1 lakh is less than 1 per cent. Thus, the income of the farmers is not directly related to the age.

### 3.1.4) Demographic profile of farmers by Annual Income

An overview of the table represents the average income of the farmers in the project states. The average annual income is close to one lakh in Andhra Pradesh and lowest average annual income is reported in the states of the Telangana and Odisha. This trend perhaps corresponds to their land holding and occupation of the farmers.

**Table No. 8 : Distribution of Households by Average and Minimum and Maximum Annual Income**

| Sl.No. | Category | Average | Minimum | Maximum |
|---|---|---|---|---|
| 1 | Andhra Pradesh | 104,984 | 10,000 | 700,000 |
| 2 | Chhattisgarh | 43,953 | 12,500 | 400,000 |
| 3 | Karnataka | 49,298 | 1,0000 | 540,000 |
| 4 | Odisha | 18,950 | 10,000 | 100,000 |
| 5 | Telangana | 18,848 | 10,000 | 500,000 |
| | Total | 47,207 | 10,500 | 2,68,000 |

(Figures in Rupees)

Among all the five states the maximum annual income is observed in the Andhra Pradesh state the overall average among all the states is Rs.42,207 the data is constituted from the most of the farmers this trend of annual income may be due to the increasing expenditure and low returns from the agriculture. The maximum annual income reported is around Rs.7 lakhs which may include the plausible reason may be some farmers are doing business or other occupation in addition to the agriculture.

**Table No.9 : Distribution of Households by Annual Income**

| Income [in Rs.] | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **<20,000** | 0 (0.00) | 28 (7.04) | 83 (21.96) | 0 (0.00) | 10 (2.88) |
| **20,000 to 50,000** | 179 (49.45) | 52 (13.07) | 153 (40.48) | 22 (6.55) | 169 (48.70) |
| **50,001 to 1 lakh** | 13 (3.59) | 186 (46.73) | 78 (20.63) | 314 (93.45) | 79 (22.77) |
| **> 1 lakh** | 170 (46.96) | 132 (33.17) | 64 (16.93) | 0 (0.00) | 89 (25.65) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

Excepting the state of Karnataka and Chhattisgarh, the households with less than Rs.20,000 annual agricultural income either is nil or a very small percentage of the households are reported to be living on. In Karnataka they account for a fifth of the total. This could be due to a number of agricultural and economic factors.

Further, nearly 40-50 per cent of the households in the state of Andhra Pradesh, Karnataka and Telangana have reported to be between Rs 20,000-50,000. The states of Andhra Pradesh and Chhattisgarh have reported of a relatively large percentage of families earning more than one lakh rupees. This is a reflection of the variation in the land holdings held by the households.

**Fig 12. Distribution according to Annual income**

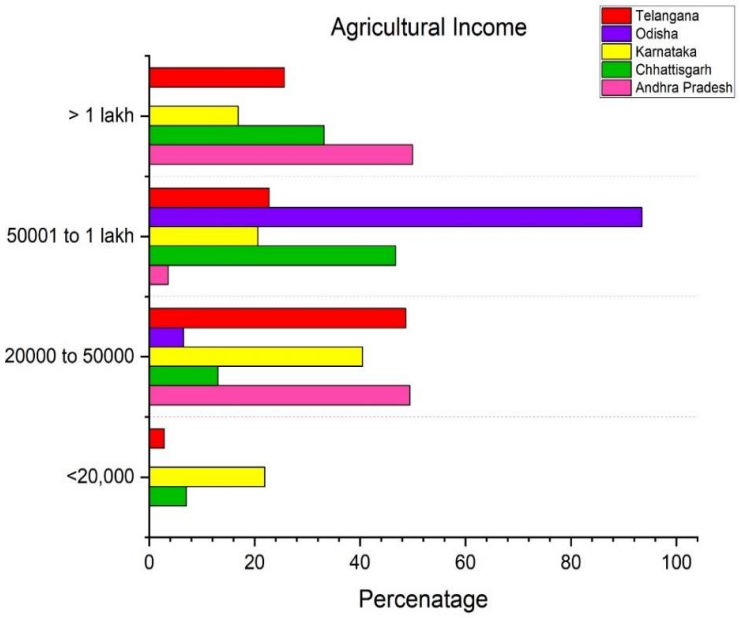



**Table No. 10: Distribution of Households by Income and Land holding held by the Household across States**

| Income level | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Below Rs.20,000** | | | | | |
| Marginal | 0 (0.00) | 24 (6.03) | 12 (3.17) | 0 (0.00) | 2 (0.58) |
| Small | 0 (0.00) | 0 (0.00) | 21 (5.56) | 0 (0.00) | 0 (0.00) |
| Semi-med | 0 (0.00) | 2 (0.50) | 37 (9.79) | 0 (0.00) | 4 (1.15) |
| Medium | 0 (0.00) | 2 (0.50) | 12 (3.17) | 0 (0.00) | 4 (1.15) |
| Large | 0 (0.00) | 0 (0.00) | 1 (0.26) | 0 (0.00) | 0 (0.00) |
| **Rs.20,000 to 50,000** | | | | | |
| Marginal | 142 (39.23) | 49 (12.31) | 2 (0.53) | 20 (5.95) | 116 (33.43) |
| Small | 26 (7.18) | 1 (0.25) | 16 (4.23) | 2 (0.60) | 11 (3.17) |
| Semi-med | 4 (1.10) | 2 (0.50) | 56 (14.81) | 0 (0.00) | 4 (1.15) |
| Medium | 6 (1.66) | 0 (0.00) | 70 (18.52) | 0 (0.00) | 34 (9.80) |
| Large | 1 (0.28) | 0 (0.00) | 9 (2.38) | 0 (0.00) | 4 (1.15) |
| **Rs. 50,001 to 1 lakh** | | | | | |
| Marginal | 2 (0.55) | 0 (0.00) | 1 (0.26) | 16 (4.76) | 12 (3.46) |
| Small | 8 (2.21) | 126 (31.66) | 5 (1.32) | 163 (48.51) | 15 (4.32) |
| Semi-med | 2 (0.55) | 60 (15.08) | 31 (8.20) | 127 (37.80) | 32 (9.22) |

| | | | | | |
|---|---|---|---|---|---|
| Medium | 1 (0.28) | 0 (0.00) | 33 (8.73) | 7 (2.08) | 15 (4.32) |
| Large | 0 (0.00) | 0 (0.00) | 8 (2.12) | 1 (0.30) | 5 (1.44) |
| **> Rs. 1 lakh** | | | | | |
| Marginal | 6 (1.66) | 0 (0.00) | 0 (0.00) | 0 (0.00) | 5 (1.44) |
| Small | 39 (10.77) | 2 (0.50) | 5 (1.32) | 0 (0.00) | 43 (12.39) |
| Semi-med | 64 (17.68) | 77 (19.35) | 15 (3.97) | 0 (0.00) | 28 (8.07) |
| Medium | 48 (13.26) | 47 (11.81) | 33 (8.73) | 0 (0.00) | 10 (2.88) |
| Large | 13 (3.59) | 6 (1.51) | 11 (2.91) | 0 (0.00) | 3 (0.86) |
| Total | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

Karnataka state is the only state wherein a small percentage of the sample households earning below Rs.20, 000 are said to be in possession of land varying in sizes [see Table 10]. None of the households in the states of Andhra Pradesh and Odisha are reporting incomes of less than Rs.20, 000 per income through agricultural sources.

In the next income group, the distribution by the land held by the household is found to be varied. While in Andhra Pradesh nearly 40 per cent of them have reported to be owning marginal lands, lesser percentage i.e. about 33 per cent in the state of Telangana have reported to be owning marginal lands. In Chhattisgarh and Odisha it is much lesser percent. It will be seen further from the table with increase in the household income, the land held by the household is also increasing and thus, the percentage owning marginal or small lands is very small. However, the same thing does not corroborate at incomes above Rs.1, 00,000 lakh. In the states of Andhra Pradesh and Chhattisgarh, about 30 per cent of the households are having semi-medium or medium sized holdings. In Telangana and Karnataka, the families with high income are yet owning lands only in the semi-medium or medium categories. There is no representation in the Odisha state. Thus, the income accruing from the lands is not directly proportional to the lands held by them in these different states. Thus, this points out the need for improved or enhanced extension services to bring about improvements in agricultural productivity and thereby income.

**Table No. 11 : Distribution of Households by Annual Agricultural Income and Sex of the Head of the Household across States**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Below Rs. 20,000** | | | | | |
| Female | 0 (0.00) | 20 (5.03) | 33 (8.73) | 0 (0.00) | 2 (0.58) |
| Male | 0 (0.00) | 8 (2.01) | 50 (13.23) | 0 (0.00) | 8 (2.31) |
| **Rs. 20,000 to 50,000** | | | | | |
| Female | 45 (12.43) | 23 (5.78) | 30 (7.94) | 5 (1.49) | 25 (7.20) |
| Male | 134 (37.02) | 29 (7.29) | 123 (32.54) | 17 (5.06) | 144 (41.50) |
| **Rs. 50,001 to 1 lakh** | | | | | |
| Female | 0 (0.00) | 50 (12.56) | 17 (4.50) | 51 (15.18) | 9 (2.59) |
| Male | 13 (3.59) | 136 (34.17) | 61 (16.14) | 263 (78.27) | 70 (20.17) |
| **> 1 lakh** | | | | | |
| Female | 10 (2.76) | 3 (0.75) | 4 (1.06) | 0 (0.00) | 15 (4.32) |
| Male | 160 (44.20) | 129 (32.41) | 60 (15.87) | 0 (0.00) | 74 (21.33) |
| Total | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

The above table while dismisses the gender differences also points out the capacities of the female heads of households to work towards enhanced agricultural incomes. It is presumed that the programme design has incorporated this by way of making the messages gender neutral or gender sensitive. In the state of Chhattisgarh the distribution across the sex groups among those earning more than Rs. 1 lakh is 075 per cent and 32.41 per cent respectively. It is 2.76 per cent and 44.20 per cent in Andhra Pradesh. These variations could be due to a number of factors.

### 3.1.5) Educational Profile of the farmers

The objective of the programme was to enhance the knowledge of the farmers relating to agriculture and thus, facilitate better earnings by the farmers in the different states. However, one of the important intermediate factor influencing the participation in the programme is the education of the head of the household. This assumes increased importance as the message was transmitted through the digital technology. In view of this, the process it must be admitted that has complicated the process initially although it is reported to have faded if not tapered off.

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| | | | | | |
| **Illeterate** | 39 (10.77) | 56 (14.07) | 47 (12.43) | 27 (8.04) | 44 (12.68) |
| **Primary** | 144 (39.78) | 193 (48.49) | 142 (37.57) | 250 (74.40) | 135 (38.90) |
| **High school** | 44 (12.15) | 28 (7.04) | 40 (10.58) | 30 (8.93) | 33 (9.51) |
| **Intermediate** | 92 (25.41) | 99 (24.87) | 115 (30.42) | 24 (7.14) | 90 (25.94) |
| **graduation** | 43 (11.88) | 22 (5.53) | 34 (8.99) | 5 (1.49) | 45 (12.97) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

**Table No. 12 : Distribution by the Educational Status of the Farmer Across States**

The study reveals that 56 per cent of farmers have studied upto primary school, followed by 24per cent at intermediate level, 12 per cent high school and only 8 per cent of farmers have completed graduation.

The study reveals that more than 32 per cent of the farmers were educated beyond matriculation. A striking number of farmers about 97 per cent with primary education is observed in the Odisha district and more number of graduates can be seen in Andhra Pradesh and Telangana states. It is very interesting to note the Karnataka state is having the highest number of farmers having school education. The study includes all the sections of people having primary school to graduate education. Overall 68 per cent of farmers are having only school education. The details of classification education of farmers are shown below in table.

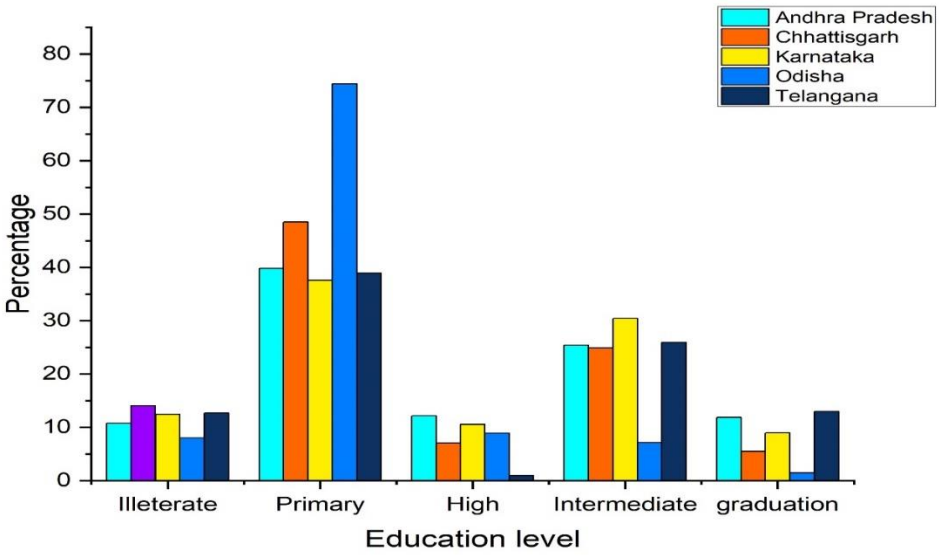



**Fig 13. Distribution according to Education level.**

### 3.1.6) Household Size

The study shows that 54.80 per cent of the farmers are living in smaller households (1-3 members), while 5.7 per cent of farmers are living in large households (6+ members). About 39.5 per cent of farmers are living in medium sized households with 4-6 members. [Change the title as Household Size]. This is reflective of the scenario observed at state or national levels. This is due to prevailing small family system in the villages.

**Fig 14 Distribution according family Size**

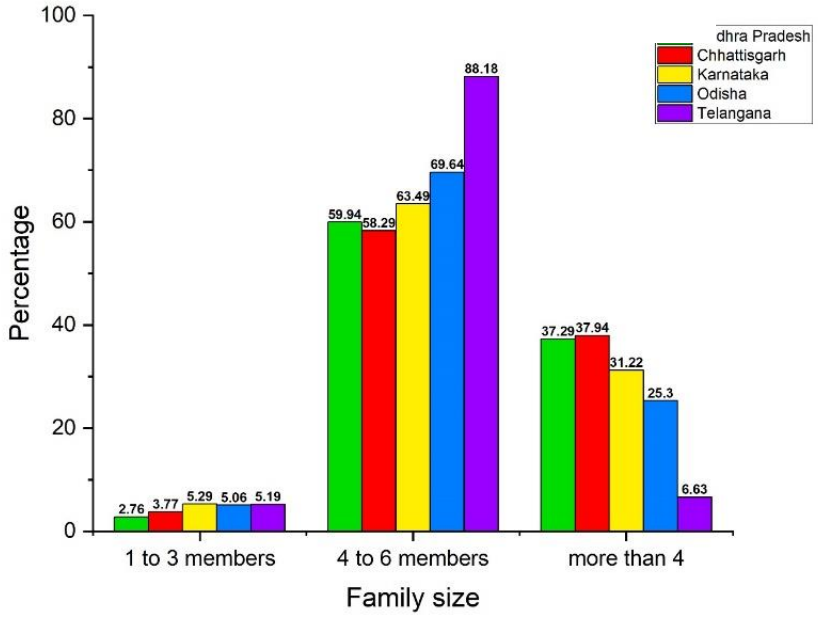



**Table No.13: Distribution of Households by Size across States**

| Household Size [in numbers] | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **1 to 3** | 10 (2.76) | 15 (3.77) | 20 (5.29) | 17 (5.06) | 18 (5.19) |
| **4 to 6** | 217 (59.94) | 232 (58.29) | 240 (63.49) | 234 (69.64) | 306 (88.18) |
| **> 4** | 135 (37.29) | 151 (37.94) | 118 (31.22) | 85 (25.30) | 23 (6.63) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

The trends in the household size is not much different across states. Broadly it is either the smaller household (1-3) or the medium sized household (4-6). In Odisha it is 5.06 per cent and 69.64 per cent. In Andhra Pradesh, 37.29 per cent of the households are large households. A good percentage in other states are also above 4.

### 3.1.7) Farming Experience of the Households

The data on farming experience of farmers shows that they have on an average 25 years' experience in farming. While at the lower end it is 2 years, at the other extreme it is roughly about 66 years.

The experience of the respondents corresponds to their age. However greater proportion of the respondents with more than 25 years is found in Chhattisgarh state and closely followed by the Odisha state. The details of farming experience, state-wise is shown in table (Table No. 14 ).

**Table No. 14 : Distribution of Households by Farming Experience across States**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **<5 years** | 7 (1.93) | 0 (0.00) | 6 (1.59) | 2 (0.60) | 13 (3.75) |
| **6-10 yrs** | 30 (8.29) | 0 (0.00) | 36 (9.52) | 21 (6.25) | 3 (0.86) |
| **11-15 yrs** | 85 (23.48) | 0 (0.00) | 67 (17.72) | 34 (10.12) | 47 (13.54) |
| **16-20 yrs** | 65 (17.96) | 10 (2.51) | 75 (19.84) | 57 (16.96) | 80 (23.05) |
| **>20 yrs** | 175 (48.34) | 388 (97.49) | 194 (51.32) | 222 (66.07) | 204 (58.79) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

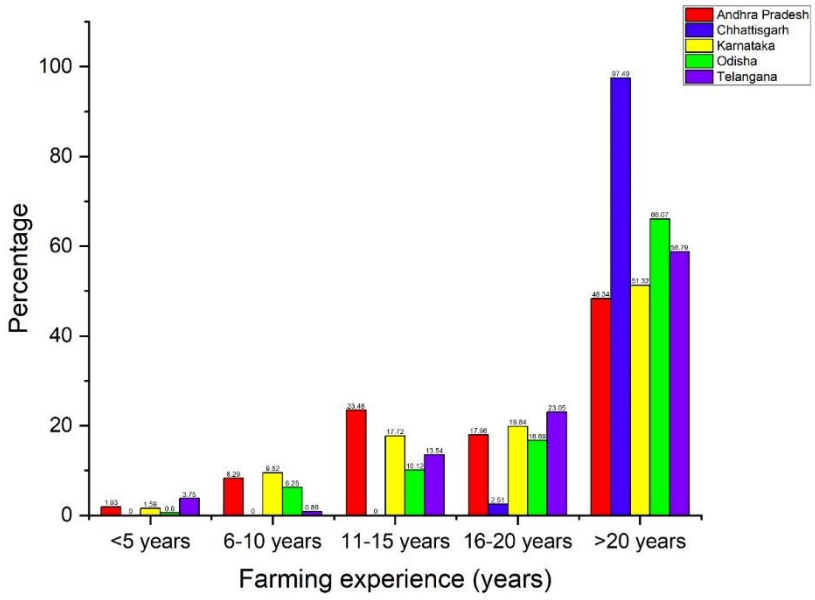



Fig 15 Distribution according farming Experience

## 3.1.8) Smart Phone Usage by farmers

The data on the usage of smart phone by farmers in the project area is to understand the usage in the agricultural realm. This is also important as the project aimed at using the technology in the dissemination of information relating to farming, farming practices and the market opportunities as well.

However, it is important to note that the majority of the respondents are using the feature phone when compared to the smart phone. Farmers seem to be showing increased preference to the feature phone because of the ease of usage and because of the complexity involved in the smart phones.

**Table No. 15: Distribution of Households by Smartphone Usage and Agricultural Lands Held by Households Across States**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Not Using Smartphone** | | | | | |
| Marginal | 93 (58.86) | 56 (17.72) | 11 (7.24) | 36 (11.08) | 95 (47.98) |
| Small | 35 (22.15) | 111 (35.13) | 18 (11.84) | 161 (49.54) | 50 (25.25) |
| Semi-medium | 11 (6.96) | 108 (34.18) | 56 (36.84) | 120 (36.92) | 24 (12.12) |
| Medium | 13 (8.23) | 37 (11.71) | 59 (38.82) | 7 (2.15) | 23 (11.62) |
| Large | 6 (3.80) | 4 (1.27) | 8 (5.26) | 1 (0.31) | 6 (3.03) |
| Total | 158 | 316 | 152 | 325 | 198 |
| **Using Smartphone** | | | | | |
| Marginal | 57 (27.94) | 17 (20.73) | 4 (1.77) | 0 (0.00) | 40 (26.85) |
| Small | 38 (18.63) | 18 (21.95) | 29 (12.83) | 4 (36.36) | 19 (12.75) |
| Semi-medium | 59 (28.92) | 33 (40.24) | 83 (36.73) | 7 (63.64) | 44 (29.53) |
| Medium | 42 (20.59) | 12 (14.63) | 89 (39.38) | 0 (0.00) | 40 (26.85) |
| Large | 8 (3.92) | 2 (2.44) | 21 (9.29) | 0 (0.00) | 6 (4.03) |
| Total | 204 | 82 | 226 | 11 | 149 |

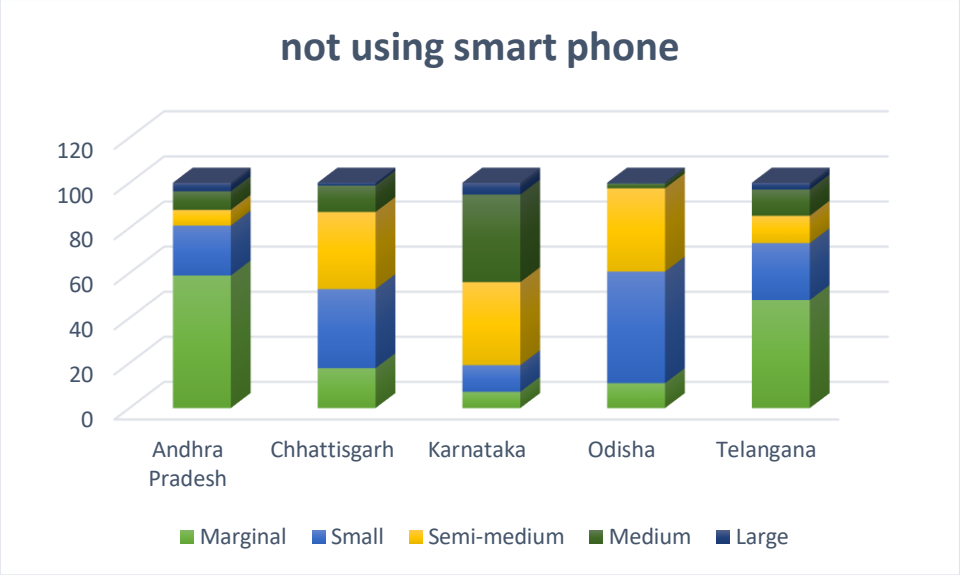



Fig 16 Distribution of respondents by smart phone usage

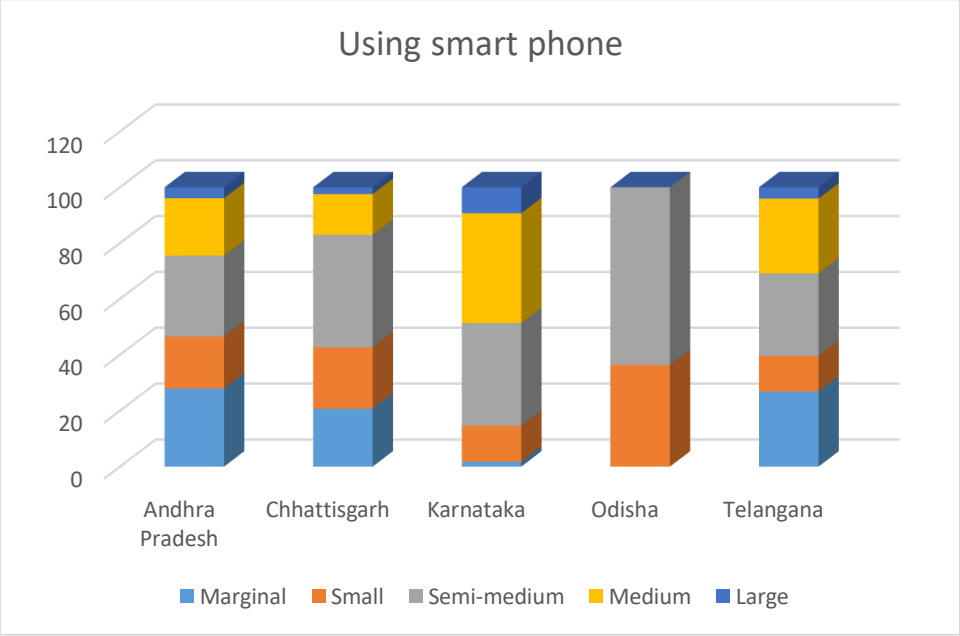



Fig 16 Distribution of respondents by smart phone usage

There seems to be a linear positive association between the type of phone and the extent of agricultural lands held by them. However, the contrary is also true. The percentage of those using smart phone is relatively more among the medium and large agricultural households than among the marginal and small agricultural households.

### 3.1.9 ) Frequency of Contacts with Extension Agents

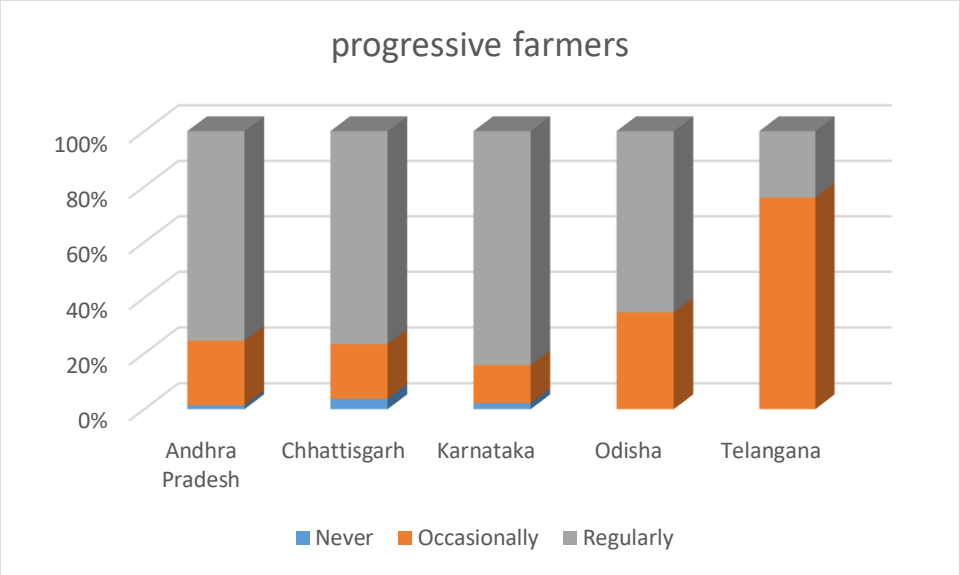
In order to help in a better understanding of the issue, the farmers were asked to indicate the frequency of their contacts with the different Institutions /Department / Progressive Farmers. It is clearly seen from the table that the contacts are with the Departments or the Progressive Farmers. The frequency is either regularly or occasionally. This has been reported by nearly 90 per cent of the farmers. But this is not to imply that there is no interaction with the other institutions such as the State Agriculture Universities or the Krishi Vigyan Kendras. About two-thirds is said to have been interacting either regularly or occasionally with these institutions as well. This could be through various activities that are being organized by the Department or when accessing various benefits or services from the department.

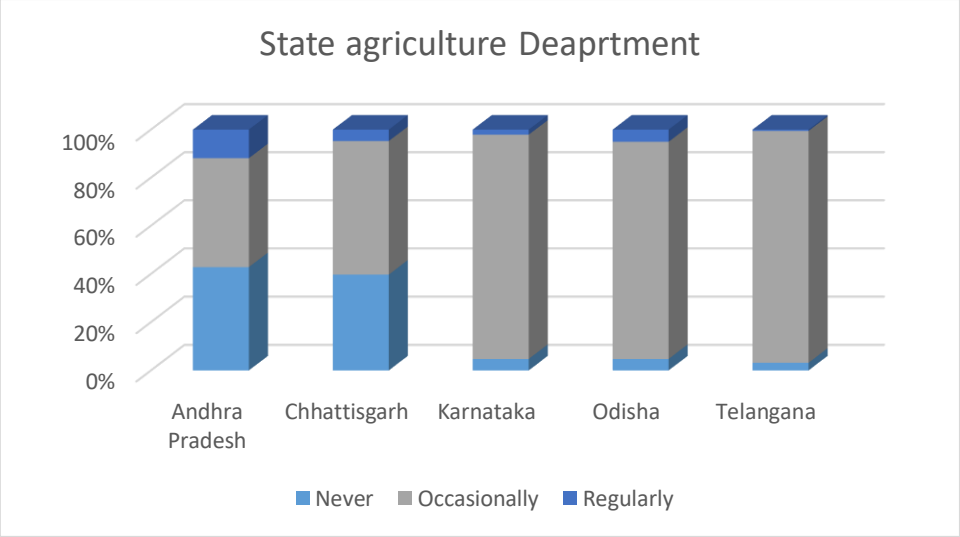
**Table No. 16 : Distribution on the frequency of Contacting Extension Agents Across States**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Progressive Farmers** | | | | | |
| Never | 5 (1.38) | 15 (3.77) | 8 (2.12) | 0 (0.00) | 0 (0.00) |
| Occasionally | 84 (23.20) | 78 (19.60) | 52 (13.76) | 117 (34.82) | 264 (76.08) |
| Regularly | 273 (75.41) | 305 (76.63) | 318 (84.13) | 219 (65.18) | 83 (23.92) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| **State Agricultural Department** | | | | | |
| Never | 155 (42.82) | 158 (39.70) | 18 (4.76) | 16 (4.76) | 11 (3.17) |
| Occasionally | 164 (45.30) | 221 (55.53) | 352 (93.12) | 303 (90.18) | 334 (96.25) |
| Regularly | 43 (11.88) | 19 (4.77) | 8 (2.12) | 17 (5.06) | 2 (0.58) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| **SAU Scientists** | | | | | |
| Never | 117 (32.32) | 180 (45.23) | 182 (48.15) | 196 (58.33) | 199 (57.35) |
| Occasionally | 150 (41.44) | 169 (42.46) | 188 (49.74) | 111 (33.04) | 137 (39.48) |
| Regularly | 95 (26.24) | 49 (12.31) | 8 (2.12) | 29 (8.63) | 11 (3.17) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

At the outset it is important to note that the contacts with the State Agricultural Department and the SAU Scientists is few and far. At least in Karnataka there are Agricultural Assistants working at the hobli level. This is indicated by the fact that from about a third to almost 60 per cent of the respondents from all the states have said to have never contacted the SAU scientists. However, a good percentage of those who are contacting them are reported to be doing occasionally [see Table No. 16]. A smaller percentage have also said to be interacting regularly.

In respect of the State Agricultural Department, either the response is never or occasionally see Table No. 16]. What is distinct from the table is the clear relationship that seems to be existing between the farm households and the progressive farmers. The only exception is that of the state of Telangana wherein only about 23 per cent are said to be successful in maintaining regular contacts with them. These percentages do go upto 75 per cent in the other states. This not only raises questions on the need and type of extension services that is expected by the farming community, but also of the relevance of methods i.e. currently explored i.e. the digital technology.





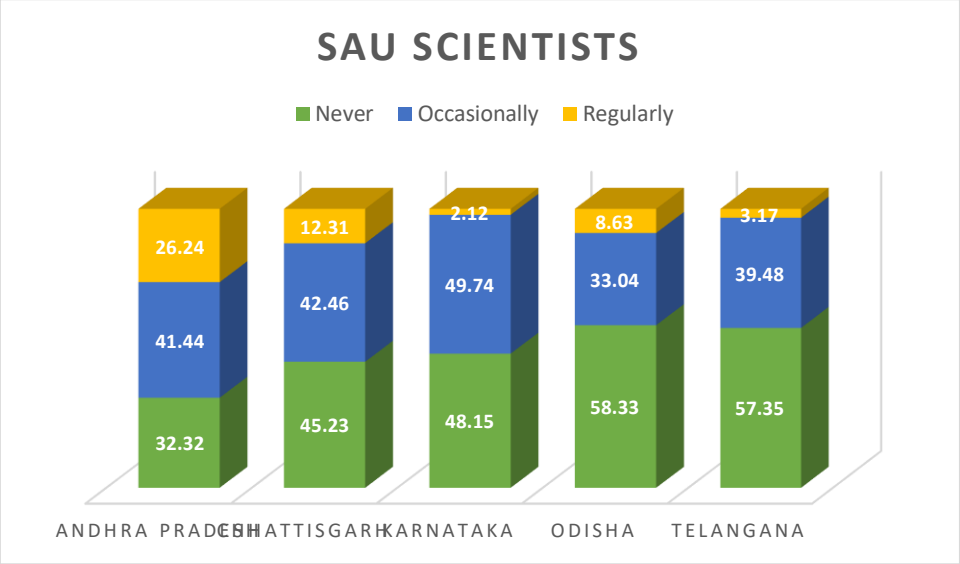




**Fig 17 Distribution on the frequency of Contacting Extension Agents Across States**

## 3.2 ) Perceptions of farmers on nice services

### 3.2.1 ) Perception on Timeliness of message

The timeliness of advisory to farmers is highly important towards carrying out various pre and post agricultural activities. The analysis of the results shows that 93 per cent of the farmers have said that the messages were provided on time. Less than 2% of farmers said that the same was not provided on time or there was delay in the receipt of the same.

**Table No. 17 : Perceptions on the Timeliness of message**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Coinciding with the crop season** | | | | | |
| **No** | 7 (1.93) | 10 (2.51) | 12 (3.17) | 16 (4.76) | 59 (17.00) |
| **Yes** | 355 (98.07) | 388 (97.49) | 366 (96.83) | 320 (95.24) | 288 (83.00) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

## 3.2.2) Perception on Advisory Services

The study has attempted at capturing the perception of the respondents towards NICE Agro-Advisory Services (NAAS) and the same is being discussed in the following section.

**Table No. 18 : Perception on Advisories**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **The Relevance of the Advisories** | | | | | |
| Strongly Disagree | 1 (0.28) | 2 (0.50) | 0 (0.00) | 4 (1.19) | 0 (0.00) |
| Disagree | 13 (3.59) | 14 (3.52) | 9 (2.38) | 29 (8.63) | 0 (0.00) |
| Undecided | 31 (8.56) | 22 (5.53) | 28 (7.41) | 30 (8.93) | 51 (14.70) |
| Agree | 69 (19.06) | 79 (19.85) | 50 (13.23) | 107 (31.85) | 245 (70.61) |
| Strongly Agree | 248 (68.51) | 281 (70.60) | 291 (76.98) | 166 (49.40) | 51 (14.70) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.0) | 336 (100.00) | 347 (100.00) |

| **Message Treatment** | | | | | |
|---|---|---|---|---|---|
| Strongly Disagree | 40 (11.05) | 53 (13.32) | 111 (29.37) | 33 (9.82) | 18 (5.19) |
| Disagree | 80 (22.10) | 72 (18.09) | 39 (10.32) | 36 (10.71) | 0 (0.00) |
| Undecided | 22 (6.08) | 27 (6.78) | 16 (4.23) | 13 (3.87) | 14 (4.03) |
| Agree | 69 (19.06) | 75 (18.84) | 55 (14.55) | 92 (27.38) | 189 (54.47) |
| Strongly Agree | 151 (41.71) | 171 (42.96) | 157 (41.53) | 162 (48.21) | 126 (36.31) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

About 57 per cent of the respondents have strongly agreed on the usefulness and relevance of the NICE services in carrying on with the day-today farming activities. About 30 percent of them have agreed on the issue. Less than 4 per cent of farmers have said disagreed on the usefulness and relevance of the NICE services. About 9 per cent of them could not indicate their opinion on the issue. Thus, it could be concluded that the large majority of the farmers have found the services provided under the nice advisories were relevant and useful.

The state wise analysis shows that the percentage of the farmers strongly agreeing on the services is the highest in Odisha [99%], followed by Karnataka [94%] farmers, and Chhattisgarh [62%]. It is found that only 10 per cent of the farmers in Andhra Pradesh have expressed strongly on this. However, nearly two thirds of the farmers from Andhra Pradesh do agree that the services were relevant. They account for 64 per cent of the total responses from the state. About 57 per cent of the farmers from Telangana have only said it to be 'agree' on the issue. d on more than 75% farmers of Andhra Pradesh, Chhattisgarh and Telangana agree the messages are relevance. The details of analysis on relevance of advisory is shown in Table No. 18.

Further, the following pages provides the extract of the various strategies adopted in the advisory services in reaching out to the Farmers in one of the states viz., Karnataka. The different modes adopted includes SMS messages in the local language for different crops, providing video URL for farmers to understand the underlying issues better, sample posters and the sample video URL delivered.

The percentage of those who have reported it to be undecided is varying across the states. It is the highest in the state of Andhra Pradesh [20%] followed by Telangana [16%]. This could be for a number of reasons for this scenario.

**Table No. 19. Perceptions on Understanding message**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Understanding of Message** | | | | | |
| Strongly Disagree | 4 (1.10) | 6 (1.51) | 5 (1.32) | 26 (7.74) | 0 (0.00) |
| Disagree | 27 (7.46) | 18 (4.52) | 13 (3.44) | 11 (3.27) | 0 (0.00) |
| Undecided | 14 (3.87) | 12 (3.02) | 11 (2.91) | 6 (1.79) | 0 (0.00) |

| | | | | | |
|---|---|---|---|---|---|
| Agree | 67 (18.51) | 95 (23.87) | 59 (15.61) | 114 (33.93) | 272 (78.39) |
| Strongly Agree | 250 (69.06) | 267 (67.09) | 290 (76.72) | 179 (53.27) | 75 (21.61) |
| **Total** | 362 (100.00) | 398(100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

The study has attempted at capturing the perceptions on the understandability of the advisories disseminated to farmers. The analysis reveals that 58 per cent of the farmers have 'strongly agreed' that the message were very easily understandable, while 33 per cent have only said 'agreed' on this issue. Thus, in all 91 per cent have found the messages understandable. The fact that these messages were provided in the regional languages might have helped in this regard. Less than 6 per cent of the farmers have said that the advisory messages were not understandable.

The analysis of the issue across the states covered during this programme only concurs the broader findings. Thus, about 8-10 per cent of the respondents from the states of Andhra Pradesh and Odisha have expressed difficulties in understanding the messages provided under the programme. However, in the same States more than 85 per cent have agreed or strongly agreed that they were able to understand the messages. The farmers with relatively poorer education seems to have expressed difficulties in this regard.

The result shows that the farmers are understanding the message and needs a very less improvement in formulating the content.

### 3.2.3) Message Treatment

The study reveals that about 87 per cent of farmers have said that the messages are packed properly and quite useful for adoption in the field. Only less than 7 per cent of farmers are reported to be not much satisfied with message treatment and packing.

The state wise analysis on the perceptions relating to the message treatment reveals the limited success achieved in providing a proper treatment to the subject that was being conveyed. About 40 per cent of the farmers in Karnataka seems to have expressed reservations on the way the messages were handled and transmitted to them. It is more than 30 per cent in the states of Andhra Pradesh and Chhattisgarh as well. However, only 5.19 per cent in the state of Telangana have expressed

difficulties in this regard. This is surprising and a important aspect which should have been considered during the project implementation period.

**Table No. 20 Content adequacy**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| | | | | | |
| **Strongly Disagree** | 1 (0.28) | 4 (1.01) | 0 (0.00) | 11 (3.27) | 0 (0.00) |
| **Disagree** | 21 (5.80) | 18 (4.52) | 16 (4.23) | 23 (6.85) | 0 (0.00) |
| **Undecided** | 27 (7.46) | 25 (6.28) | 18 (4.76) | 10 (2.98) | 9 (2.59) |
| **Agree** | 70 (19.34) | 87 (21.86) | 57 (15.08) | 97 (28.87) | 215 (61.96) |
| **Strongly Agree** | 243 (67.13) | 264 (66.33) | 287 (75.93) | 195 (58.04) | 123 (35.45) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

The study also focused on the adequacy of content disseminated to farmers. The content disseminated aimed to provide knowledge to farmers to implement the advisory or practices advised by the scientists. Insufficient content may lead to improper practices by the farmers. The NICE advisory services are focused on content packaging for farmers in different forms viz., Short Message Services [SMS], Posters and video URLs etc. The results of analysis of the responses shows that 80-90 per cent of farmers have expressed satisfaction on the adequacy of the content. It is the highest in the state of Telangana i.e.97.41 per cent. This is followed by Karnataka with 91 per cent. A good percentage of the farmers from the other states viz., Andhra Pradesh-89 per cent, Telangana-86 per cent and Chhattisgarh-88 per cent farmers are satisfied with NICE advisory content.

## 3.3) Farmers opinion on NICE Services

The current study has attempted at capturing the information on their assessment of the services provided to the farmers. The same is analysed in the following section.

**Table No. 21 : Assessment of the Services Provided to the Farmers**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Information Provided under NICE is Clearly Understandable** | | | | | |
| Disagree | 5 (1.38) | 10 (2.51) | 1 (0.26) | 0 (0.00) | 0 (0.00) |
| undecided | 10 (2.76) | 9 (2.26) | 4 (1.06) | 19 (5.65) | 32 (9.22) |
| Agree | 95 (26.24) | 107 (26.88) | 155 (41.01) | 128 (38.10) | 251 (72.33) |
| Strongly Agree | 252 (69.61) | 272 (68.34) | 218 (57.67) | 189 (56.25) | 64 (18.44) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| **NICE Provides Time Based Information** | | | | | |
| Disagree | 9 (2.49) | 25 (6.28) | 0 (0.00) | 3 (0.89) | 0 (0.00) |
| undecided | 13 (3.59) | 9 (2.26) | 22 (5.82) | 25 (7.44) | 43 (12.39) |
| Agree | 97 (26.80) | 124 (31.16) | 139 (36.77) | 137 (40.77) | 229 (65.99) |
| Strongly Agree | 243 (67.13) | 240 (60.30) | 217 (57.41) | 171 (50.89) | 75 (21.61) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| **NICE Provides Need Based Information** | | | | | |
| Disagree | 5 (1.38) | 10 (2.51) | 5 (1.32) | 14 (4.17) | 2 (0.58) |
| undecided | 14 (3.87) | 24 (6.03) | 12 (3.17) | 28 (8.33) | 20 (5.76) |
| Agree | 94 (25.97) | 121 (30.40) | 116 (30.69) | 102 (30.36) | 168 (48.41) |
| Strongly Agree | 249 (68.78) | 243 (61.06) | 245 (64.81) | 192 (57.14) | 157 (45.24) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| **NICE Services saves time and money** | | | | | |
| Disagree | 5 (1.38) | 19 (4.77) | 9 (2.38) | 19 (5.65) | 3 (0.86) |
| undecided | 17 (4.70) | 16 (4.02) | 18 (4.76) | 17 (5.06) | 31 (8.93) |
| Agree | 121 (33.43) | 125 (31.41) | 99 (26.19) | 107 (31.85) | 181 (52.16) |
| Strongly Agree | 219 (60.50) | 238 (59.80) | 252 (66.67) | 193 (57.44) | 132 (38.04) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| **NICE Services Promotes Increase in Knowledge** | | | | | |
| Disagree | 12 (3.31) | 25 (6.28) | 6 (1.59) | 18 (5.36) | 1 (0.29) |
| undecided | 22 (6.08) | 24 (6.03) | 19 (5.03) | 9 (2.68) | 13 (3.75) |
| Agree | 106 (29.28) | 130 (32.66) | 99 (26.19) | 127 (37.80) | 239 (68.88) |
| Strongly Agree | 222 (61.33) | 219 (55.03) | 254 (67.20) | 182 (54.17) | 94 (27.09) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

As can be seen from the above table , the messages disseminated under the programme is said to be clearly understandable. This is very clear from opinions across the states. The variation is only in terms of whether they strongly agree or agree on the issue. This is quite expected as the messages are provided in the local languages. It is not only the messages, the posters, the videos etc., provided are there in the local language. There seems to be have been good exercise before transmitting any messages and thus, the unanimity.

**NICE provides 'time' and 'need' based information**

A similar opinion has been echoed across all the states. A very small portion have expressed dissatisfaction on these aspects or were undecided during the time of this survey. Almost all the respondents have either agreed or strongly agreed on the subject. This is understandable as the very objective of the exercise was to provide the right information at the right time and in the way that is most understandable. The technique of doing it through 'digital technology' has only added vitality and significance to the programme.

**NICE Services Promotes Increase in Knowledge**

This is again another issue wherein there is broad unanimity. The information that was passed on various aspects related to crop management is said to have resulted in increased knowledge to the households. This is so because it was based on various experiments and experiences gathered by the project personnel.

The perceptions on other aspects such as its relevance in attaining increased productivity, its adaptability in field conditions, relevance of posters, video links and the SMS are presented in the following table. It is found that there is not much of difference in their perceptions [see Table No. 21 ].

**Table No. 21 : Assessment of the Services Provided to the Farmers – Contd.**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| NICE Services Promotes Increase in Productivity | | | | | |
| Disagree | 7 (1.93) | 15 (3.77) | 6 (1.59) | 14 (4.17) | (0.00) |
| undecided | 14 (3.87) | 19 (4.77) | 19 (5.03) | 22 (6.55) | 27 (7.78) |
| Agree | 108 (29.83) | 143 (35.93) | 209 (55.29) | 151 (44.94) | 188 (54.18) |
| Strongly Agree | 233 (64.36) | 221 (55.53) | 144 (38.10) | 149 (44.35) | 132 (38.04) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| **Information Provided by NICE Services is Adaptable in Field Conditions** | | | | | |
| Disagree | 9 (2.49) | 22 (5.53) | 8 (2.12) | 20 (5.95) | 7 (2.02) |
| undecided | 17 (4.70) | 19 (4.77) | 18 (4.76) | 10 (2.98) | 10 (2.88) |
| Agree | 98 (27.07) | 132 (33.17) | 116 (30.69) | 112 (33.33) | 164 (47.26) |
| Strongly Agree | 238 (65.75) | 225 (56.53) | 236 (62.43) | 194 (57.74) | 166 (47.84) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| **The Advisory Services in the form of Posters are Understandable, Useful and Effective** | | | | | |
| Disagree | 8 (2.21) | 15 (3.77) | 6 (1.59) | 13 (3.87) | (0.00) |
| undecided | 20 (5.52) | 14 (3.52) | 19 (5.03) | 16 (4.76) | 11 (3.17) |
| Agree | 97 (26.80) | 126 (31.66) | 118 (31.22) | 112 (33.33) | 196 (56.48) |
| Strongly Agree | 237 (65.47) | 243 (61.06) | 235 (62.17) | 195 (58.04) | 140 (40.35) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| **The Advisory Services in the form of Video Links are Understandable, Useful and Effective** | | | | | |
| Disagree | 6 (1.66) | 22 (5.53) | 7 (1.85) | 20 (5.95) | 4 (1.15) |
| undecided | 13 (3.59) | 14 (3.52) | 9 (2.38) | 15 (4.46) | 18 (5.19) |
| Agree | 100 (27.62) | 125 (31.41) | 123 (32.54) | 110 (32.74) | 171 (49.28) |
| Strongly Agree | 243 (67.13) | 237 (59.55) | 239 (63.23) | 191 (56.85) | 154 (44.38) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| **The Advisory Services in the form of SMS are Understandable, Useful and Effective** | | | | | |
| Disagree | 7 (1.93) | 9 (2.26) | 3 (0.79) | 7 (2.08) | (0.00) |
| undecided | 12 (3.31) | 14 (3.52) | 7 (1.85) | 9 (2.68) | 6 (1.73) |
| Agree | 99 (27.35) | 138 (34.67) | 114 (30.16) | 107 (31.85) | 149 (42.94) |
| Strongly Agree | 244 (67.40) | 237 (59.55) | 254 (67.20) | 213 (63.39) | 192 (55.33) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

It is found that more than two thirds of the respondents have said that the advisory services through video links and SMS messages are useful. The pattern is not varied across the Tables. This is evident from the table.

## 3.4) Impact of NICE Agro Advisory Services (NAAS) on farmers

The impact of NICE Agro Advisory Services was assessed on various parameters to measure the better crop management practices by farmers using NICE advisory services (NAAS) such as better crop management, application of critical inputs, insects, pest and disease management, timely farm operations, crop rotation/shifting, timely crop protection, appropriate technical information etc. The following table shows the responses of farmers on 5 point scale i.e. Strongly Agree to Strongly Disagree. The details of responses on each parameter is described in following paragraphs. With a view to get better insights for detailed analysis, opinions are broadly categorized into three broad groups viz., Agree, Uncertain and Disagree.

In the following section, a detailed analysis is attempted on the different aspects of the crop management practices.

### 3.4.1) Impact of crop management practices

**Table No. 22 Better seasonal crop management is possible due to the NICE Agro Advisory Services (NAAS)**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Marginal** | | | | | |
| Disagree | 4 (1.10) | 4 (1.01) | 0 (0.00) | 0 (0.00) | 3 (0.86) |
| uncertain | 5 (1.38) | 7 (1.76) | 2 (0.53) | 3 (0.89) | 24 (6.92) |
| Agree | 141 (38.95) | 62 (15.58) | 13 (3.44) | 33 (9.82) | 108 (31.12) |
| **small** | | | | | |
| Disagree | 0 (0.00) | 10 (2.51) | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| uncertain | 1 (0.28) | 9 (2.26) | 3 (0.79) | 16 (4.76) | 10 (2.88) |
| Agree | 72 (19.89) | 110 (27.64) | 44 (11.64) | 149 (44.35) | 59 (17.00) |
| **Semi med** | | | | | |
| Disagree | 1 (0.28) | 9 (2.26) | 0 (0.00) | 2 (0.60) | (0.00) |
| uncertain | 3 (0.83) | 12 (3.02) | 5 (1.32) | 10 (2.98) | 13 (3.75) |

| | | | | | |
|---|---|---|---|---|---|
| Agree | 66 (18.23) | 120 (30.15) | 134 (35.45) | 115 (34.23) | 55 (15.85) |
| **medium** | | | | | |
| Disagree | 1 (0.28) | 3 (0.75) | 0 (0.00) | 1 (0.30) | 0 (0.00) |
| uncertain | 3 (0.83) | 2 (0.50) | 0 (0.00) | 11 (3.27) | 11 (3.17) |
| Agree | 51 (14.09) | 44 (11.06) | 136 (35.98) | 7 (2.08) | 52 (14.99) |
| **large** | | | | | |
| Disagree | 0 (0.00) | 1 (0.25) | 0 (0.00) | 1 (0.30) | 0 (0.00) |
| uncertain | 1 (0.28) | (0.00) | 1 (0.26) | 1 (0.30) | 0 (0.00) |
| Agree | 13 (3.59) | 5 (1.26) | 0 (0.00) | 27 (8.04) | 12 (3.46) |
| **Total** | | | | | |
| Disagree | 6 (1.66) | 27 (6.78) | 2 (0.53) | 2 (0.60) | 3 (0.86) |
| uncertain | 13 (3.59) | 30 (7.54) | 22 (5.82) | 30 (8.93) | 58 (16.71) |
| Agree | 343 (94.75) | 341 (85.68) | 354 (93.65) | 304 (90.48) | 286 (82.42) |
| | 362 (100.00) | 398 (100.00) | 378 (100) | 336 (100.00) | 347 (100.00) |

About 45 per cent of the respondents have strongly agreed, while 44 per cent of the farmers have agreed that they are able to manage their crops better with the help of NICE advisory services. The fact that the services are planned on a timely basis based upon the cropping condition / stages in the respective districts seems to have helped them a lot. Thus, over 89 per cent of farmers are satisfied with NAAS advisory services in better management of crop during crop season. However, about 11 per cent have not expressed their satisfaction on this issues. The analysis across the states perhaps may throw better insights into the issue.

**Table No. 23. Critical inputs can be optimally used by the farmer due to the guidance received through NAAS**

| | Andhra | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Marginal** | | | | | |
| Disagree | 5 (1.38) | 3 (0.75) | 0 (0.00) | (0.00) | 2 (0.58) |
| uncertain | 3 (0.83) | (0.00) | 0 (0.00) | 2 (0.60) | 3 (0.86) |
| Agree | 142 (39.23) | 70 (17.59) | 13 (3.44) | 36 (10.71) | 130 (37.46) |
| **small** | | | | | |
| Disagree | 1 (0.28) | 7 (1.76) | 1 (0.26) | 2 (0.60) | (0.00) |
| uncertain | 3 (0.83) | 7 (1.76) | 2 (0.53) | 4 (1.19) | (0.00) |
| Agree | 69 (19.06) | 115 (28.89) | 44 (11.64) | 159 (47.32) | 69 (19.88) |
| **Semi med** | | | | | |
| Disagree | 1 (0.28) | 7 (1.76) | 0 (0.00) | 0 (0.00) | (0.00) |
| uncertain | 1 (0.28) | 5 (1.26) | 3 (0.79) | 6 (1.79) | 2 (0.58) |
| Agree | 68 (18.78) | 129 (32.41) | 136 (35.98) | 121 (36.01) | 66 (19.02) |
| **medium** | | | | | |
| Disagree | 1 (0.28) | (0.00) | 0 (0.00) | 3 (0.89) | (0.00) |
| uncertain | 1 (0.28) | 4 (1.01) | 0 (0.00) | 5 (1.49) | 1 (0.29) |
| Agree | 53 (14.64) | 45 (11.31) | 140 (37.04) | 7 (2.08) | 62 (17.87) |
| **large** | | | | | |
| Disagree | (0.00) | 1 (0.25) | 0 (0.00) | 2 (0.60) | (0.00) |
| uncertain | 14 (3.87) | 5 (1.26) | 27 (7.14) | 1 (0.30) | 12 (3.46) |
| Agree | 14 (3.87) | 6 (1.51) | 29 (7.67) | 1 (0.30) | 12 (3.46) |
| **Total** | | | | | |
| Disagree | 8 (2.21) | 18 (4.52) | 6 (1.59) | 2 (0.60) | 2 (0.58) |
| uncertain | 8 (2.21) | 16 (4.02) | 12 (3.17) | 10 (2.98) | 6 (1.73) |
| Agree | 346 (95.58) | 364 (91.46) | 360 (95.24) | 324 (96.43) | 339 (97.69) |
| | 362 (100.00) | 398 (100.00) | 378 100 | 336 (100.00) | 347 (100.00) |

A majority of the farmers have either strongly agreed (58%) or agreed (37%) on the relevance of the inputs provided through NAAS into their day today agricultural operations. This seems to reflect very much on various aspects related to transmission of the messages i.e. the presentation of the messages to the farming community – text, pictures or visuals, audio, video; the language, the tone and most importantly the language and its timing as well. The farmers seems to have used

the inputs at right time which has resulted in reducing costs and thus added to the profitability assuming that a better market conditions prevailed for these farmers.

**Table No. 24. NAAS helps farmer in proper insect pest and disease management**

| | Andhra | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Marginal** | | | | | |
| Disagree | 2 (0.55) | 6 (1.51) | 0 (0.00) | 1 (0.30) | 2 (0.58) |
| uncertain | 14 (3.87) | 1 (0.25) | 0 (0.00) | 1 (0.30) | 2 (0.58) |
| Agree | 134 (37.02) | 66 (16.58) | 13 (3.44) | 36 (10.71) | 131 (37.75) |
| **small** | | | | | |
| Disagree | 2 (0.55) | 8 (2.01) | 1 (0.26) | 7 (2.08) | 1 (0.29) |
| uncertain | 4 (1.10) | 6 (1.51) | 1 (0.26) | 4 (1.19) | (0.00) |
| Agree | 67 (18.51) | 115 (28.89) | 45 (11.90) | 154 (45.83) | 68 (19.60) |
| **Semi med** | | | | | |
| Disagree | (0.00) | 12 (3.02) | 2 (0.53) | 6 (1.79) | 1 (0.29) |
| uncertain | 2 (0.55) | 5 (1.26) | 1 (0.26) | 7 (2.08) | 1 (0.29) |
| Agree | 68 (18.78) | 124 (31.16) | 136 (35.98) | 114 (33.93) | 66 (19.02) |
| **medium** | | | | | |
| Disagree | 1 (0.28) | (0.00) | 0 (0.00) | 2 (0.60) | (0.00) |
| uncertain | 2 (0.55) | (0.00) | 0 (0.00) | 2 (0.60) | (0.00) |
| Agree | 52 (14.36) | 49 (12.31) | 144 (38.10) | 7 (2.08) | 63 (18.16) |
| **large** | | | | | |
| Disagree | 1 (0.28) | (0.00) | 0 (0.00) | 1 (0.30) | 1 (0.29) |
| uncertain | (0.00) | 1 (0.25) | 0 (0.00) | 1 (0.30) | (0.00) |
| Agree | 13 (3.59) | 5 (1.26) | 27 (7.14) | 1 (0.30) | 11 (3.17) |
| **Total** | | | | | |
| Disagree | 6 (1.66) | 26 (6.53) | 7 (1.85) | 13 (3.87) | 5 (1.44) |
| uncertain | 22 (6.08) | 13 (3.27) | 6 (1.59) | 11 (3.27) | 3 (0.86) |
| Agree | 334 (92.27) | 359 (90.20) | 365 (96.56) | 312 (92.86) | 339 (97.69) |
| | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

The farmers seems to have over reacted when it came to the issue of advisories relating to the pest and disease management through the advisory generated by the scientists. An overwhelming per

cent of the respondents i.e. 94 per cent of farmers seems to have either strongly agreed or agreed on the pest and disease management.

The perceptions of the farmers is found to vary across the states. It is about 97 per cent in both the states of Telangana and Karnataka. For the states of Andhra Pradesh and Odisha it is just little over 90 per cent and it is the least in Chhattisgarh it is about 90 per cent. These marginal variations could be a reflection of the very many factors including the sales campaigns launched by those involved in production and sale of pesticides, status of agriculture in the region, practices adopted by the farmers in handling these critical issues etc., The analysis of the same is beyond the realm of the present report as well as the programme.

**Table No. 25. Farm operations like sowing, harvesting, marketing etc. can be performed well on time with the help of technical guidance**

| | Andhra | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Marginal** | | | | | |
| Disagree | 4 (1.10) | 7 (1.76) | 0 (0.00) | 3 (0.89) | 3 (0.86) |
| uncertain | 6 (1.66) | 3 (0.75) | 0 (0.00) | 3 (0.89) | 3 (0.86) |
| Agree | 140 (38.67) | 63 (15.83) | 12 (3.17) | 33 (9.82) | 129 (37.18) |
| **Small** | | | | | |
| Disagree | 4 (1.10) | 4 (1.01) | 0 (0.00) | 11 (3.27) | 1 (0.29) |
| uncertain | 3 (0.83) | 8 (2.01) | 2 (0.53) | 8 (2.38) | (0.00) |
| Agree | 66 (18.23) | 117 (29.40) | 45 (11.90) | 146 (43.45) | 68 (19.60) |
| **Semi med** | | | | | |
| Disagree | 3 (0.83) | 10 (2.51) | 3 (0.79) | 17 (5.06) | 1 (0.29) |
| uncertain | 3 (0.83) | 3 (0.75) | 2 (0.53) | 8 (2.38) | 2 (0.58) |
| Agree | 64 (17.68) | 128 (32.16) | 134 (35.45) | 102 (30.36) | 65 (18.73) |
| **medium** | | | | | |
| Disagree | 1 (0.28) | 2 (0.50) | 0 (0.00) | 5 (1.49) | (0.00) |
| uncertain | (0.00) | 1 (0.25) | 0 (0.00) | 6 (1.79) | 1 (0.29) |
| Agree | 54 (14.92) | 46 (11.56) | 137 (36.24) | 7 (2.08) | 62 (17.87) |
| **large** | | | | | |
| Disagree | 0 (0.00) | (0.00) | 1 (0.26) | 1 (0.30) | 1 (0.29) |

| | | | | | |
|---|---|---|---|---|---|
| uncertain | 0 (0.00) | 1 (0.25) | 0 (0.00) | 2 (0.60) | (0.00) |
| Agree | 14 (3.87) | 5 (1.26) | 0 (0.00) | 26 (7.74) | 11 (3.17) |
| **Total** | | | | | |
| Disagree | 12 (3.31) | 23 (5.78) | 9 (2.38) | 32 (9.52) | 6 (1.73) |
| uncertain | 12 (3.31) | 16 (4.02) | 15 (3.97) | 16 (4.76) | 6 (1.73) |
| Agree | 338 (93.37) | 359 (90.20) | 354 (93.65) | 288 (85.71) | 335 (96.54) |
| | 362 (100.00) | 398 100 | 378 (100.00) | 336 100 | 347 (100.00) |

Over all 91 per cent of the farmers (strongly agree 57% and agree 34%) are very clear that NICE advisory services has increased their knowledge on carrying out operations like sowing, harvesting, marketing etc. [see Table No. 27 ]. It is pertinent to observe that very few of the farmers disagreed upon this statement.

The project level findings are further corroborated by the state level findings as well. The largest percentage of negative response to the subject is from the state of Odisha. Almost 10 per cent have negated the useful of these messages relating to sowing, harvesting, marketing etc., This is followed by about 6 per cent in the state of Chhattisgarh. The percentage of those who are 'undecided' is less than 5 per cent in all the States. Notwithstanding these differences, it can be safely concluded that NAAS services or advises has been found to be relevant by the farmers. Perhaps what becomes critical is to analyse the effects at the household level. Thus, it is important to see whether the programme was successful in transferring the knowledge into bringing about changes in the behaviours and attitudes and finally adoption notwithstanding the role of the factors such as availability and accessibility to the services, affordability, and the obstacles in its effective adoption.

**Table No. 26. Farmer can shift the cropping pattern with the help of weather advisory services**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Marginal** | | | | | |
| Disagree | 9 (2.49) | 5 (1.26) | 0 (0.00) | 1 (0.30) | 1 (0.29) |
| uncertain | 62 (17.13) | 20 (5.03) | 3 (0.79) | 19 (5.65) | 13 (3.75) |

| | | | | | |
|---|---|---|---|---|---|
| Agree | 79 (21.82) | 48 (12.06) | 11 (2.91) | 17 (5.06) | 121 (34.87) |
| **small** | | | | | |
| Disagree | 1 (0.28) | 8 (2.01) | 1 (0.26) | 7 (2.08) | 1 (0.29) |
| uncertain | 26 (7.18) | 37 (9.30) | 19 (5.03) | 55 (16.37) | 3 (0.86) |
| Agree | 46 (12.71) | 84 (21.11) | 27 (7.14) | 103 (30.65) | 65 (18.73) |
| **Semi med** | | | | | |
| Disagree | 2 (0.55) | 8 (2.01) | 2 (0.53) | 4 (1.19) | 0 (0.00) |
| uncertain | 24 (6.63) | 43 (10.80) | 40 (10.58) | 44 (13.10) | 5 (1.44) |
| Agree | 44 (12.15) | 90 (22.61) | 97 (25.66) | 19 (5.65) | 63 (18.16) |
| **medium** | | | | | |
| Disagree | 1 (0.28) | 4 (1.01) | 0 (0.00) | 4 (1.19) | 0 (0.00) |
| uncertain | 11 (3.04) | 14 (3.52) | 38 (10.05) | 4 (1.19) | 7 (2.02) |
| Agree | 43 (11.88) | 31 (7.79) | 106 (28.04) | 3 (0.89) | 56 (16.14) |
| **large** | | | | | |
| Disagree | 1 (0.28) | 0 (0.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| uncertain | 0 (0.00) | 2 (0.50) | 7 (1.85) | 1 (0.30) | 1 (0.29) |
| Agree | 13 (3.59) | 4 (1.01) | 0 (0.00) | 22 (6.55) | 11 (3.17) |
| **Total** | | | | | |
| Disagree | 14 (3.87) | 25 (6.28) | 8 (2.12) | 11 (3.27) | 2 (0.58) |
| uncertain | 123 (33.98) | 116 (29.15) | 107 (28.31) | 123 (36.61) | 29 (8.36) |
| Agree | 225 (62.15) | 257 (64.57) | 263 (69.58) | 202 (60.12) | 316 (91.07) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

The fifth aspect that is covered under the crop management practices is that relating to shift in the cropping pattern. This perhaps is very significant both from the macro and the micro level. This is because with each advancing day the farmer perhaps struggles to find ways and means of improving his earnings for his labour and perhaps the solution could come through changes in the crops that he has been cultivating. The results are presented in the following tables.

Nearly 71% of the respondents agreed that they can shift the cropping pattern based on the weather advisories and about 29% of respondents have said that they cannot shift the cropping pattern with the help of weather advisory services provided by the NICE. Thus, these findings are very different from what has been discussed earlier.

Excepting the state of Telangana, in all the other states the extent of farmers expressing difficulties in shifting over to the crops suggested through the programme is around 30 per cent. The results could be understood in two or three different ways. Firstly, the relevance of the shifts suggested keeping all the socio-cultural and economic factors into consideration. Secondly, is this indicative of the strong mind set that is there in the farming community in terms of changing over to the other crops. The third, which could be a continuation of the earlier one, is the economic implications of these changes which the farmers is not prepared to take up.

The farmers in the state of Telangana stand completely different from the other states in this regard. More than 90 per cent have categorically agreed on the high relevance of the messages related to the shift in the cropping pattern. While this may be indicative of their positive attitude, the equally important issue is the reasons for not doing so by the other states as well. In all the other states it varies between 60 to 70 per cent.

**Table No. 27. Timely pest and disease forecasting leads to proper crop protection measures**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Marginal** | | | | | |
| Disagree | 4 (1.10) | 4 (1.01) | 0 (0.00) | 2 (0.60) | 5 (1.44) |
| uncertain | 11 (3.04) | 3 (0.75) | 0 (0.00) | 2 (0.60) | 4 (1.15) |
| Agree | 135 (37.29) | 66 (16.58) | 13 (3.44) | 34 (10.12) | 126 (36.31) |
| **small** | | | | | |
| Disagree | 1 (0.28) | 10 (2.51) | 0 (0.00) | 6 (1.79) | 0 (0.00) |
| uncertain | 4 (1.10) | 2 (0.50) | 2 (0.53) | 3 (0.89) | 1 (0.29) |
| Agree | 68 (18.78) | 117 (29.40) | 45 (11.90) | 156 (46.43) | 68 (19.60) |
| **Semi med** | | | | | |
| Disagree | 1 (0.28) | 5 (1.26) | 2 (0.53) | 5 (1.49) | 0 (0.00) |
| uncertain | 1 (0.28) | 3 (0.75) | 2 (0.53) | 3 (0.89) | 0 (0.00) |
| Agree | 68 (18.78) | 133 (33.42) | 135 (35.71) | 119 (35.42) | 68 (19.60) |
| **medium** | | | | | |
| Disagree | 3 (0.83) | 2 (0.50) | 0 (0.00) | 1 (0.30) | 0 (0.00) |
| uncertain | 1 (0.28) | 2 (0.50) | 0 (0.00) | 10 (2.98) | 0 (0.00) |
| Agree | 51 (14.09) | 45 (11.31) | 137 (36.24) | 7 (2.08) | 63 (18.16) |
| **large** | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Disagree | 0 (0.00) | 0 (0.00) | 0 (0.00) | 1 (0.30) | 0 (0.00) |
| uncertain | 1 (0.28) | 0 (0.00) | 0 (0.00) | 1 (0.30) | 0 (0.00) |
| Agree | 13 (3.59) | 6 (1.51) | 27 (7.14) | 1 (0.30) | 12 (3.46) |
| **Total** | | | | | |
| Disagree | 9 (2.49) | 21 (5.28) | 4 (1.06) | 13 (3.87) | 5 (1.44) |
| uncertain | 18 (4.97) | 10 (2.51) | 17 (4.50) | 6 (1.79) | 5 (1.44) |
| Agree | 335 (92.54) | 367 (92.21) | 357 (94.44) | 317 (94.35) | 337 (97.12) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

Most of the respondents i.e., 91 per cent have strongly agreed that timely pest and disease forecasting leads to proper crop protection measures. This clearly indicates that there will be less wastage of the time and resources in indiscriminate application of pesticide usage in the field and the result is good health crop with higher yields.

**Table No. 28. Weather advisory helps in proper management of transportation of farm produce for distant market**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Marginal** | | | | | |
| Disagree | 5 (1.38) | 7 (1.76) | 1 (0.26) | 1 (0.30) | 1 (0.29) |
| uncertain | 5 (1.38) | 3 (0.75) | 4 (1.06) | 4 (1.19) | 10 (2.88) |
| Agree | 140 (38.67) | 63 (15.83) | 15 (3.97) | 31 (9.23) | 124 (35.73) |
| **small** | | | | | |
| Disagree | 4 (1.10) | 3 (0.75) | 0 (0.00) | 7 (2.08) | (0.00) |
| uncertain | 5 (1.38) | 8 (2.01) | 3 (0.79) | 6 (1.79) | 1 (0.29) |
| Agree | 64 (17.68) | 118 (29.65) | 44 (11.64) | 152 (45.24) | 68 (19.60) |
| **Semi med** | | | | | |
| Disagree | 2 (0.55) | 9 (2.26) | 1 (0.26) | 5 (1.49) | (0.00) |
| uncertain | 1 (0.28) | 3 (0.75) | 3 (0.79) | 8 (2.38) | 6 (1.73) |
| Agree | 67 (18.51) | 129 (32.41) | 135 (35.71) | 114 (33.93) | 62 (17.87) |
| **medium** | | | | | |
| Disagree | 1 (0.28) | (0.00) | 0 (0.00) | 3 (0.89) | 1 (0.29) |

| | | | | | |
|---|---|---|---|---|---|
| uncertain | 3 (0.83) | 2 (0.50) | 6 (1.59) | 6 (1.79) | 3 (0.86) |
| Agree | 51 (14.09) | 47 (11.81) | 139 (36.77) | 7 (2.08) | 59 (17.00) |
| **large** | | | | | |
| Disagree | 0 (0.00) | 0 (0.00) | 0 (0.00) | 1 (0.30) | 1 (0.29) |
| uncertain | 0 (0.00) | 1 (0.25) | 1 (0.26) | 1 (0.30) | 0 (0.00) |
| Agree | 14 (3.87) | 5 (1.26) | 0 (0.00) | 27 (8.04) | 11 (3.17) |
| **Total** | | | | | |
| Disagree | 12 (3.31) | 19 (4.77) | 5 (1.32) | 13 (3.87) | 3 (0.86) |
| uncertain | 14 (3.87) | 17 (4.27) | 13 (3.44) | 19 (5.65) | 20 (5.76) |
| Agree | 336 (92.82) | 362 (90.95) | 360 (95.24) | 304 (90.48) | 324 (93.37) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

Altogether 93 per cent of the farmers felt that "Weather advisory helps in proper management of transportation of farm produce for distant market" and 2.74 per cent have disagreed to it. About 5 per cent have not been able to clearly give out their opinion on it. Transportation of produce on time will definitely help the farmers in securing the produce and also the better price.

**Table No. 29. Sometimes technical information is too technical to understand**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Marginal** | | | | | |
| Agree | 39 (10.77) | 24 (6.03) | 0 (0.00) | 3 (0.89) | 5 (1.44) |
| uncertain | 6 (1.66) | 2 (0.50) | 0 (0.00) | 1 (0.30) | 9 (2.59) |
| Disagree | 105 (29.01) | 47 (11.81) | 14 (3.70) | 33 (9.82) | 121 (34.87) |
| **small** | | | | | |
| Agree | 23 (6.35) | 38 (9.55) | 3 (0.79) | 10 (2.98) | 2 (0.58) |
| uncertain | 6 (1.66) | 7 (1.76) | 3 (0.79) | 5 (1.49) | 8 (2.31) |
| Disagree | 44 (12.15) | 84 (21.11) | 41 (10.85) | 150 (44.64) | 59 (17.00) |
| **Semi med** | | | | | |
| Agree | 13 (3.59) | 33 (8.29) | 8 (2.12) | 11 (3.27) | 4 (1.15) |
| uncertain | 8 (2.21) | 13 (3.27) | 3 (0.79) | 6 (1.79) | 3 (0.86) |
| Disagree | 49 (13.54) | 95 (23.87) | 128 (33.86) | 110 (32.74) | 61 (17.58) |
| **medium** | | | | | |
| Agree | 11 (3.04) | 14 (3.52) | 0 (0.00) | 7 (2.08) | 2 (0.58) |
| uncertain | 11 (3.04) | (0.00) | 0 (0.00) | 7 (2.08) | (0.00) |

| | | | | | |
|---|---|---|---|---|---|
| Disagree | 33 (9.12) | 35 (8.79) | 134 (35.45) | 7 (2.08) | 61 (17.58) |
| **large** | | | | | |
| Agree | 1 (0.28) | (0.00) | 1 (0.26) | 1 (0.30) | 1 (0.29) |
| uncertain | (0.00) | 1 (0.25) | 0 (0.00) | 2 (0.60) | (0.00) |
| Disagree | 13 (3.59) | 5 (1.26) | 0 (0.00) | 26 (7.74) | 11 (3.17) |
| **Total** | | | | | |
| Agree | 87 (24.03) | 109 (27.39) | 19 (5.03) | 25 (7.44) | 14 (4.03) |
| uncertain | 31 (8.56) | 23 (5.78) | 16 (4.23) | 11 (3.27) | 20 (5.76) |
| Disagree | 244 (67.40) | 266 (66.83) | 343 (90.74) | 300 (89.29) | 313 (90.20) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

The issue of the 'technicality 'in the information provided through these advisory services is an issue only in the states of Andhra Pradesh and Chhattisgarhi. About 24.03 per cent and 27.39 per cent have reflected on this problem. It is not so in other states. On further analysis it is found that the marginal farmers have raised this issue in many of the states. Thus, 10.07 and 6.33 per cent among the marginal farmers in both the states of Andhra Pradesh and Chhattisgarh. It is 1.44 per cent in Telangana as well. The same issue us raised by the small farmers as well in both the states [see table 31]. This may be due to the limited education and awareness possessed by these land holding groups.

**Table No. 30: Distribution of Households by Perceptions on Seasonal Crop Management and the Land Holdings Held Across States**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Marginal** | | | | | |
| Disagree | 4 (1.10) | 4 (1.01) | 0 (0.00) | 0 (0.00) | 3 (0.86) |
| Uncertain | 5 (1.38) | 7 (1.76) | 2 (0.53) | 3 (0.89) | 24 (6.92) |
| Agree | 141 (38.95) | 62 (15.58) | 13 (3.44) | 33 (9.82) | 108 (31.12) |
| **Small** | | | | | |
| Disagree | 0 (0.00) | 10 (2.51) | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| Uncertain | 1 (0.28) | 9 (2.26) | 3 (0.79) | 16 (4.76) | 10 (2.88) |
| Agree | 72 (19.89) | 110 (27.64) | 44 (11.64) | 149 (44.35) | 59 (17.00) |
| **Semi -med** | | | | | |
| Disagree | 1 (0.28) | 9 (2.26) | 0 (0.00) | 2 (0.60) | (0.00) |
| Uncertain | 3 (0.83) | 12 (3.02) | 5 (1.32) | 10 (2.98) | 13 (3.75) |
| Agree | 66 (18.23) | 120 (30.15) | 134 (35.45) | 115 (34.23) | 55 (15.85) |
| **Medium** | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Disagree | 1 (0.28) | 3 (0.75) | 0 (0.00) | 1 (0.30) | 0 (0.00) |
| Uncertain | 3 (0.83) | 2 (0.50) | 0 (0.00) | 11 (3.27) | 11 (3.17) |
| Agree | 51 (14.09) | 44 (11.06) | 136 (35.98) | 7 (2.08) | 52 (14.99) |
| **Large** | | | | | |
| Disagree | 0 (0.00) | 1 (0.25) | 0 (0.00) | 1 (0.30) | 0 (0.00) |
| Uncertain | 1 (0.28) | (0.00) | 1 (0.26) | 1 (0.30) | 0 (0.00) |
| Agree | 13 (3.59) | 5 (1.26) | 0 (0.00) | 27 (8.04) | 12 (3.46) |
| **Total** | | | | | |
| Disagree | 6 (1.66) | 27 (6.78) | 2 (0.53) | 2 (0.60) | 3 (0.86) |
| Uncertain | 13 (3.59) | 30 (7.54) | 22 (5.82) | 30 (8.93) | 58 (16.71) |
| Agree | 343 (94.75) | 341 (85.68) | 354 (93.65) | 304 (90.48) | 286 (82.42) |
| | 362 (100.00) | 398 (100.00) | 378 100 | 336 (100.00) | 347 (100.00) |

An interesting finding seems to be emerging from the above analysis. In the states of Andhra Pradesh and Telangana, it is the marginal farmers who have agreed on the relevance or the usefulness of these messages relating to seasonal crop management. The percentage is more than a third of the total. Since both the states represent a particular socio-economic set up, the findings seems to be very relevant. A smaller percentage of the respondents from the other states have also shared a similar opinion although their numbers are smaller.

In the state of Odisha, the small [44.35%] and semi-medium [34.23%] sized land holders have found this useful. The state of Chhattisgarh is found to be following the Odisha as well. In the state of Karnataka this is true of the semi-medium [35.45%] and medium [35.98%] of the land holders.

Excepting the state of Odisha, the large land holders in all the other states have not expressed great keenness in this regard.

In the absence of a strong bearing of the extent of the land holding on crop management practices, it was decided to examine the influence of the farming experience on the same. The same is presented in the following table.

**Table No. 31 : Distribution of Households by Farming Experience and Perception on Better Seasonal Crop Management as a result of NAAS Services**

| Farming Experience | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **<5 years** | | | | | |
| **Disagree** | 0 (0.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| **Uncertain** | 0 (0.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) | 1 (0.29) |
| **Agree** | 7 (1.93) | 0 (0.00) | 6 (1.59) | 2 (0.60) | 12 (3.46) |
| **6-10 yrs** | | | | | |
| **Disagree** | 1 (0.28) | 0 (0.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| **uncertain** | 0 (0.00) | 0 (0.00) | 1 (0.26) | 0 (0.00) | 1 (0.29) |
| **Agree** | 29 (8.01) | 0 (0.00) | 35 (9.26) | 21 (6.25) | 2 (0.58) |
| **11-15 yrs.** | | | | | |
| **Disagree** | 0 (0.00) | 0 (0.00) | 2 (0.53) | 1 (0.30) | 0 (0.00) |
| **uncertain** | 1 (0.28) | 0 (0.00) | 4 (1.06) | 4 (1.19) | 8 (2.31) |
| **Agree** | 84 (23.20) | 0 (0.00) | 61 (16.14) | 29 (8.63) | 39 (11.24) |
| **16-20 yrs.** | | | | | |
| **Disagree** | 2 (0.55) | 0 (0.00) | 0 (0.00) | (0.00) | 1 (0.29) |
| **uncertain** | 4 (1.10) | 0 (0.00) | 5 (1.32) | 6 (1.79) | 10 (2.88) |
| **Agree** | 59 (16.30) | 10 (2.51) | 70 (18.52) | 51 (15.18) | 69 (19.88) |
| **>20 yrs.** | | | | | |
| **Disagree** | 3 (0.83) | 27 (6.78) | 0 (0.00) | 1 (0.30) | 2 (0.58) |
| **uncertain** | 8 (2.21) | 30 (7.54) | 12 (3.17) | 20 (5.95) | 38 (10.95) |
| **Agree** | 164 (45.30) | 331 (83.17) | 182 (48.15) | 201 (59.82) | 164 (47.26) |

With the increase in the number of experience in the farming activity, there seems to be a increased interest in understanding the relevance of NAAS and adopting the same. This is quite clearly seen in the states of Andhra Pradesh, Karnataka and Odisha. The number of those who feel strongly increases from 0.60 among those with less than 5 years of farming experience to 6.25 per cent among 6-10 years, 8.63 per cent in 11-15 years, 15.18 per cent in 16-20 and 59.82 among those with more than 20 years of farming experience. Perhaps, the farmers who begin their activity with their traditional knowledge or from what they have been told, over a period of time try and adopt insights gained from various sources and finally with long years of experience feel that the 'scientific knowledge' gives them a better edge than other sources.

**Table No. 32 : Distribution of Households by Land Holdings and Perceptions on the Critical Inputs Across States**

| Land Holding | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Marginal** | | | | | |
| Disagree | 5 (1.38) | 3 (0.75) | 0 (0.00) | (0.00) | 2 (0.58) |
| Uncertain | 3 (0.83) | (0.00) | 0 (0.00) | 2 (0.60) | 3 (0.86) |
| Agree | 142 (39.23) | 70 (17.59) | 13 (3.44) | 36 (10.71) | 130 (37.46) |
| **Small** | | | | | |
| Disagree | 1 (0.28) | 7 (1.76) | 1 (0.26) | 2 (0.60) | (0.00) |
| Uncertain | 3 (0.83) | 7 (1.76) | 2 (0.53) | 4 (1.19) | (0.00) |
| Agree | 69 (19.06) | 115 (28.89) | 44 (11.64) | 159 (47.32) | 69 (19.88) |
| **Semi med** | | | | | |
| Disagree | 1 (0.28) | 7 (1.76) | 0 (0.00) | 0 (0.00) | (0.00) |
| Uncertain | 1 (0.28) | 5 (1.26) | 3 (0.79) | 6 (1.79) | 2 (0.58) |
| Agree | 68 (18.78) | 129 (32.41) | 136 (35.98) | 121 (36.01) | 66 (19.02) |
| **Medium** | | | | | |
| Disagree | 1 (0.28) | (0.00) | 0 (0.00) | 3 (0.89) | (0.00) |
| Uncertain | 1 (0.28) | 4 (1.01) | 0 (0.00) | 5 (1.49) | 1 (0.29) |
| Agree | 53 (14.64) | 45 (11.31) | 140 (37.04) | 7 (2.08) | 62 (17.87) |
| **Large** | | | | | |
| Disagree | (0.00) | 1 (0.25) | 0 (0.00) | 2 (0.60) | (0.00) |
| Uncertain | 14 (3.87) | 5 (1.26) | 27 (7.14) | 1 (0.30) | 12 (3.46) |
| Agree | 14 (3.87) | 6 (1.51) | 29 (7.67) | 1 (0.30) | 12 (3.46) |

The analysis further reinforces the earlier findings that these benefits are perceived differently in the states. The trend seems to fall into three broad groups of states viz., Telangana and Andhra Pradesh; Odisha and Chhattisgarh and Karnataka. While it may be out of context, it needs to be noted that the four states excluding Karnataka the four states were earlier part of one dispensation and thus continue to exhibit similar socio-economic conditions and thus, uniformity in their perceptions.

**Table No. 33: Distribution of Households by Years of Farming Experience and Perception on Optimal Usage of Critical Inputs as a result of NAAS Services**

| Farming Experience | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **<5 years** | | | | | |
| **Disagree** | 0 (0.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| **Uncertain** | 0 (0.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| **Agree** | 7 (1.93) | 0 (0.00) | 6 (1.59) | 2 (0.60) | 13 (3.75) |
| **6-10 years.** | | | | | |
| **Disagree** | 0 (0.00) | 0 (0.00) | 1 (0.26) | 0 (0.00) | 0 (0.00) |
| **Uncertain** | 0 (0.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| **Agree** | 30 (8.29) | 0 (0.00) | 35 (9.26) | 21 (6.25) | 3 (0.86) |
| **11-15 years.** | | | | | |
| **Disagree** | 0 (0.00) | 0 (0.00) | 1 (0.26) | 1 (0.30) | 0 (0.00) |
| **Uncertain** | 2 (0.55) | 0 (0.00) | 3 (0.79) | 1 (0.30) | 2 (0.58) |
| **Agree** | 83 (22.93) | 0 (0.00) | 63 (16.67) | 32 (9.52) | 45 (12.97) |
| **16-20 yrs.** | | | | | |
| **Disagree** | 3 (0.83) | 0 (0.00) | 2 (0.53) | 0 (0.00) | 1 (0.29) |
| **Uncertain** | 1 (0.28) | 0 (0.00) | 3 (0.79) | 4 (1.19) | 0 (0.00) |
| **Agree** | 61 (16.85) | 10 (2.51) | 70 (18.52) | 53 (15.77) | 79 (22.77) |
| **>20 yrs.** | | | | | |
| **Disagree** | 5 (1.38) | 18 (4.52) | 2 (0.53) | 1 (0.30) | 1 (0.29) |
| **Uncertain** | 5 (1.38) | 16 (4.02) | 6 (1.59) | 5 (1.49) | 4 (1.15) |
| **Agree** | 165 (45.58) | 354 (88.94) | 186 (49.21) | 216 (64.29) | 199 (57.35) |

It is very interesting to note a similar relationship that was seen in respect of better seasonal crop management. It is found that with higher level of farming experience, there is a significant rise in the percentage of those who feel that critical inputs could be better used through the guidance under NAAS. This has been pointed out by 88.94 per cent of the farmers in the state of Chhattisgarh, 57.35 per cent in Telangana and 64.29 per cent in Odisha. The percentage is very small with those with less years of farming experience. This may be due to the fact that they lack the necessary exposure in this regard.

**Table No.34: Distribution of Households by Perceptions relating to services provided on Pest and Disease Management and Land Holdings Held across States**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Marginal** | | | | | |
| Disagree | 2 (0.55) | 6 (1.51) | 0 (0.00) | 1 (0.30) | 2 (0.58) |
| Uncertain | 14 (3.87) | 1 (0.25) | 0 (0.00) | 1 (0.30) | 2 (0.58) |
| Agree | 134 (37.02) | 66 (16.58) | 13 (3.44) | 36 (10.71) | 131 (37.75) |
| **Small** | | | | | |
| Disagree | 2 (0.55) | 8 (2.01) | 1 (0.26) | 7 (2.08) | 1 (0.29) |
| Uncertain | 4 (1.10) | 6 (1.51) | 1 (0.26) | 4 (1.19) | (0.00) |
| Agree | 67 (18.51) | 115 (28.89) | 45 (11.90) | 154 (45.83) | 68 (19.60) |
| **Semi med** | | | | | |
| Disagree | (0.00) | 12 (3.02) | 2 (0.53) | 6 (1.79) | 1 (0.29) |
| Uncertain | 2 (0.55) | 5 (1.26) | 1 (0.26) | 7 (2.08) | 1 (0.29) |
| Agree | 68 (18.78) | 124 (31.16) | 136 (35.98) | 114 (33.93) | 66 (19.02) |
| **Medium** | | | | | |
| Disagree | 1 (0.28) | (0.00) | 0 (0.00) | 2 (0.60) | (0.00) |
| Uncertain | 2 (0.55) | (0.00) | 0 (0.00) | 2 (0.60) | (0.00) |
| Agree | 52 (14.36) | 49 (12.31) | 144 (38.10) | 7 (2.08) | 63 (18.16) |
| **Large** | | | | | |
| Disagree | 1 (0.28) | (0.00) | 0 (0.00) | 1 (0.30) | 1 (0.29) |
| Uncertain | (0.00) | 1 (0.25) | 0 (0.00) | 1 (0.30) | (0.00) |
| Agree | 13 (3.59) | 5 (1.26) | 27 (7.14) | 1 (0.30) | 11 (3.17) |
| **Total** | | | | | |
| Disagree | 6 (1.66) | 26 (6.53) | 7 (1.85) | 13 (3.87) | 5 (1.44) |
| Uncertain | 22 (6.08) | 13 (3.27) | 6 (1.59) | 11 (3.27) | 3 (0.86) |
| Agree | 334 (92.27) | 359 (90.20) | 365 (96.56) | 312 (92.86) | 339 (97.69) |
| | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

The broad highlights from the above analysis could be summarized as follows:

In the state of Andhra Pradesh, with increasing size of the land held by the family there is decreased agreement with regard to the usage of the information on the pest and disease management. Thus, while 37.02 per cent of the marginal farmers have agreed on the usefulness, it is only 3.59 per cent in respect of the large farmers. The trend is the same in Telangana state as well.

The contrary is true in the state of Karnataka. While 3.44 per cent of the marginal farmers have agreed it is 38.10 per cent in respect of the medium sized land holders. Only 7.14 per cent of the large land holding families have expressed relevance. To a very great extent the state of Chhattisgarh seems to follow Karnataka in this regard.

In the state of Odisha, of the five different categories of land holders, the marginal, small and the semi-medium have found the message relevant.

**Table No. 35 : Distribution of Households by Perceptions relating to services provided on Pest and Disease Management and Farming Experience across States**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| <5 years | | | | | |
| Agree | 7 (1.93) | 0 (0.00) | 6 (1.59) | 2 (0.60) | 13 (3.75) |
| 6-10 yrs | | | | | |
| Disagree | 1 (0.28) | 0 (0.00) | 0 (0.00) | 1 (0.30) | 0 (0.00) |
| Uncertain | 1 (0.28) | 0 (0.00) | 1 (0.26) | 2 (0.60) | 0 (0.00) |
| Agree | 28 (7.73) | 0 (0.00) | 35 (9.26) | 18 (5.36) | 3 (0.86) |
| 11-15 yrs | | | | | |
| Disagree | 1 (0.28) | 0 (0.00) | 1 (0.26) | 1 (0.30) | 2 (0.58) |
| Uncertain | 4 (1.10) | 0 (0.00) | 0 (0.00) | 2 (0.60) | 0 (0.00) |
| Agree | 80 (22.10) | 0 (0.00) | 66 (17.46) | 31 (9.23) | 45 (12.97) |
| 16-20 yrs | | | | | |
| Disagree | 2 (0.55) | 0 (0.00) | 1 (0.26) | 2 (0.60) | 2 (0.58) |
| Uncertain | 2 (0.55) | 1 (0.25) | 3 (0.79) | (0.00) | 0 (0.00) |
| Agree | 61 (16.85) | 9 (2.26) | 71 (18.78) | 55 (16.37) | 78 (22.48) |
| >20 yrs | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Disagree | 2 (0.55) | 26 (6.53) | 5 (1.32) | 9 (2.68) | 1 (0.29) |
| uncertain | 15 (4.14) | 12 (3.02) | 2 (0.53) | 7 (2.08) | 3 (0.86) |
| Agree | 158 (43.65) | 350 (87.94) | 187 (49.47) | 206 (61.31) | 200 (57.64) |

Excepting those with less than 5 years of farming experience, a good percentage of all others with varied experience seem to agree that the advisory services were helpful in the area of pest and disease management. Thus, of those with more than 20 years of farming experience, 43.65 per cent of the farmers in Andhra Pradesh and 87.94 per cent in Chhattisgarh seem to agree on the importance of these services. Thus, the perceptions seems to be influenced by various factors including the farming experience.

**Table No. 36 : Distribution of Households by Land Holding and Perception on Shifts on the Cropping Pattern across States**

| | Andhra | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Marginal** | | | | | |
| Disagree | 9 (2.49) | 5 (1.26) | 0 (0.00) | 1 (0.30) | 1 (0.29) |
| Uncertain | 62 (17.13) | 20 (5.03) | 3 (0.79) | 19 (5.65) | 13 (3.75) |
| Agree | 79 (21.82) | 48 (12.06) | 11 (2.91) | 17 (5.06) | 121 (34.87) |
| **Small** | | | | | |
| Disagree | 1 (0.28) | 8 (2.01) | 1 (0.26) | 7 (2.08) | 1 (0.29) |
| Uncertain | 26 (7.18) | 37 (9.30) | 19 (5.03) | 55 (16.37) | 3 (0.86) |
| Agree | 46 (12.71) | 84 (21.11) | 27 (7.14) | 103 (30.65) | 65 (18.73) |
| **Semi med** | | | | | |
| Disagree | 2 (0.55) | 8 (2.01) | 2 (0.53) | 4 (1.19) | 0 (0.00) |
| Uncertain | 24 (6.63) | 43 (10.80) | 40 (10.58) | 44 (13.10) | 5 (1.44) |
| Agree | 44 (12.15) | 90 (22.61) | 97 (25.66) | 19 (5.65) | 63 (18.16) |
| **Medium** | | | | | |
| Disagree | 1 (0.28) | 4 (1.01) | 0 (0.00) | 4 (1.19) | 0 (0.00) |
| Uncertain | 11 (3.04) | 14 (3.52) | 38 (10.05) | 4 (1.19) | 7 (2.02) |
| Agree | 43 (11.88) | 31 (7.79) | 106 (28.04) | 3 (0.89) | 56 (16.14) |
| **Large** | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Disagree | 1 (0.28) | 0 (0.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| Uncertain | 0 (0.00) | 2 (0.50) | 7 (1.85) | 1 (0.30) | 1 (0.29) |
| Agree | 13 (3.59) | 4 (1.01) | 0 (0.00) | 22 (6.55) | 11 (3.17) |

The above analysis clearly points out the interests and the motivation of the farmers holding varied land holdings. It is clearly evident as seen in the case of Andhra Pradesh, 21.82 per cent of the marginal farmers as against 3.59 per cent of the large holding families have expressed interest in changing over the cropping patterns. This could be a result of the limited lands held by the marginal farmers and the need to optimize the returns from it as opposed to the large farmers where perhaps 'land' is still not a scarce commodity to be rationally used or exploited. The trends are also different in the state of Karnataka. It is the other way round. It is more important to note that under each of the categories of the farmers, a smaller percentage have said that they are undecided on the issue. Perhaps, through this they may be referring to the role of the other factors such as the productivity,

the climatic factors etc., State of Telangana is very similar to the Andhra Pradesh state. Thus, the advisory services will have to move beyond 'economics' and talk of various other factors. It is not very clear how far the new experiment has been able to attempt at it.

**Table No. 37 : Distribution of Households by Farming Experience and Perception on Shifts on the Cropping Pattern Across States**

| | Andhra | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **<5 years** | | | | | |
| Disagree | 1 (0.28) | 0 (0.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| Uncertain | 3 (0.83) | 0 (0.00) | 1 (0.26) | 1 (0.30) | 1 (0.29) |
| Agree | 3 (0.83) | 0 (0.00) | 5 (1.32) | 1 (0.30) | 12 (3.46) |
| **6-10 yrs** | | | | | |
| Disagree | (0.00) | (0.00) | 1 (0.26) | 1 (0.30) | 0 (0.00) |
| Uncertain | 13 (3.59) | 0 (0.00) | 17 (4.50) | 2 (0.60) | 0 (0.00) |
| Agree | 17 (4.70) | 0 (0.00) | 18 (4.76) | 18 (5.36) | 3 (0.86) |
| **11-15 yrs** | | | | | |
| Disagree | (0.00) | 0 (0.00) | 2 (0.53) | (0.00) | 0 (0.00) |
| Uncertain | 28 (7.73) | 0 (0.00) | 22 (5.82) | 9 (2.68) | 6 (1.73) |
| Agree | 57 (15.75) | 0 (0.00) | 43 (11.38) | 25 (7.44) | 41 (11.82) |
| **16-20 yrs** | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Disagree | 1 (0.28) | 0 (0.00) | 3 (0.79) | 3 (0.89) | 0 (0.00) |
| Uncertain | 25 (6.91) | 4 (1.01) | 19 (5.03) | 24 (7.14) | 7 (2.02) |
| Agree | 39 (10.77) | 6 (1.51) | 53 (14.02) | 30 (8.93) | 73 (21.04) |
| **>20 yrs** | | | | | |
| Disagree | 12 (3.31) | 25 (6.28) | 2 (0.53) | 7 (2.08) | 2 (0.58) |
| Uncertain | 54 (14.92) | 112 (28.14) | 48 (12.70) | 87 (25.89) | 15 (4.32) |
| Agree | 109 (30.11) | 251 (63.07) | 144 (38.10) | 128 (38.10) | 187 (53.89) |

The perceptions seems to be influenced by the years of the farming experience. It is about a third of the farmers in the 20+ years group. It significantly drops in the previous group. Thus, only 10.77 per cent in Andhra Pradesh and 14.02 per cent in Karnataka and 21.04 per cent in Telangana have said that they agree on the issue. Thus, this points out the need to bring in concepts such as 'satisfied customer approach' into the programme through appropriate improvements in the programmer strategies.

**Table No. 38 : Distribution of Households by Land Holding and Perception on Timely Pest and Disease Forecasting Leads to Proper Crop Protection Measures**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Marginal** | | | | | |
| Disagree | 4 (1.10) | 4 (1.01) | 0 (0.00) | 2 (0.60) | 5 (1.44) |
| Uncertain | 11 (3.04) | 3 (0.75) | 0 (0.00) | 2 (0.60) | 4 (1.15) |
| Agree | 135 (37.29) | 66 (16.58) | 13 (3.44) | 34 (10.12) | 126 (36.31) |
| **Small** | | | | | |
| Disagree | 1 (0.28) | 10 (2.51) | 0 (0.00) | 6 (1.79) | 0 (0.00) |
| Uncertain | 4 (1.10) | 2 (0.50) | 2 (0.53) | 3 (0.89) | 1 (0.29) |
| Agree | 68 (18.78) | 117 (29.40) | 45 (11.90) | 156 (46.43) | 68 (19.60) |
| **Semi med** | | | | | |
| Disagree | 1 (0.28) | 5 (1.26) | 2 (0.53) | 5 (1.49) | 0 (0.00) |
| Uncertain | 1 (0.28) | 3 (0.75) | 2 (0.53) | 3 (0.89) | 0 (0.00) |
| Agree | 68 (18.78) | 133 (33.42) | 135 (35.71) | 119 (35.42) | 68 (19.60) |
| **Medium** | | | | | |
| Disagree | 3 (0.83) | 2 (0.50) | 0 (0.00) | 1 (0.30) | 0 (0.00) |

| | | | | | |
|---|---|---|---|---|---|
| Uncertain | 1 (0.28) | 2 (0.50) | 0 (0.00) | 10 (2.98) | 0 (0.00) |
| Agree | 51 (14.09) | 45 (11.31) | 137 (36.24) | 7 (2.08) | 63 (18.16) |
| **Large** | | | | | |
| Disagree | 0 (0.00) | 0 (0.00) | 0 (0.00) | 1 (0.30) | 0 (0.00) |
| Uncertain | 1 (0.28) | 0 (0.00) | 0 (0.00) | 1 (0.30) | 0 (0.00) |
| Agree | 13 (3.59) | 6 (1.51) | 27 (7.14) | 1 (0.30) | 12 (3.46) |

While the trends seems to be in favour of NAAS services in relation to plant protection measures, the perceptions is found to vary across the different land holding classes in the different states. Among the total in the state of Andhra Pradesh, while 3.59 per cent of large land holding households have concurred with this, it is as high as 37.29 per cent in respect of the marginal land holders. This is also true in Telangana state. It is the other way round in the state of Karnataka. In the states of Chhattisgarh and Odisha, the small and the semi-medium land holders seems to have weighed the prospects much better than the other land holding groups. Thus, perhaps this seems to point out the role of the other factors such as the seasonality, the type of crop grown and the extent to which it is grown as well. Notwithstanding these variations, it is still clear that the services have been quite useful.

**Table No. 39 : Distribution of Households by Farming Experience and Perception on Timely Pest and Disease Forecasting Leads to Proper Crop Protection Measures**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **<5 years** | | | | | |
| Disagree | (0.00) | (0.00) | 1 (0.26) | (0.00) | 0 (0.00) |
| uncertain | 1 (0.28) | 0 (0.00) | (0.00) | (0.00) | 0 (0.00) |
| Agree | 6 (1.66) | 0 (0.00) | 5 (1.32) | 2 (0.60) | 13 (3.75) |
| **6-10 yrs** | | | | | |
| Disagree | (0.00) | (0.00) | (0.00) | 1 (0.30) | 0 (0.00) |
| uncertain | 1 (0.28) | 0 (0.00) | (0.00) | (0.00) | 0 (0.00) |
| Agree | 29 (8.01) | 0 (0.00) | 36 (9.52) | 20 (5.95) | 3 (0.86) |
| **11-15 yrs** | | | | | |
| Disagree | 0 (0.00) | 0 (0.00) | 0 (0.00) | 4 (1.19) | 0 (0.00) |

| | | | | | |
|---|---|---|---|---|---|
| uncertain | 2 (0.55) | 0 (0.00) | 3 (0.79) | 2 (0.60) | 0 (0.00) |
| Agree | 83 (22.93) | 0 (0.00) | 64 (16.93) | 28 (8.33) | 47 (13.54) |
| **16-20 yrs** | | | | | |
| Disagree | 1 (0.28) | 0 (0.00) | 1 (0.26) | 2 (0.60) | 2 (0.58) |
| uncertain | 5 (1.38) | 0 (0.00) | 4 (1.06) | (0.00) | 2 (0.58) |
| Agree | 59 (16.30) | 10 (2.51) | 70 (18.52) | 55 (16.37) | 76 (21.90) |
| **>20 yrs** | | | | | |
| Disagree | 8 (2.21) | 21 (5.28) | 2 (0.53) | 6 (1.79) | 3 (0.86) |
| uncertain | 9 (2.49) | 10 (2.51) | 10 (2.65) | 4 (1.19) | 3 (0.86) |
| Agree | 158 (43.65) | 357 (89.70) | 182 (48.15) | 212 (63.10) | 198 (57.06) |

The perceptions seems to be influenced by the years of the farming experience. Thus, this points out the need to bring in concepts such as 'satisfied customer approach' into the programme through appropriate improvements in the programme strategies.

**Table No. 40 : Perceptions of the Households on Weather Advisories by Extent of Land Holdings Across States**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Marginal** | | | | | |
| Disagree | 5 (1.38) | 7 (1.76) | 1 (0.26) | 1 (0.30) | 1 (0.29) |
| Uncertain | 5 (1.38) | 3 (0.75) | 4 (1.06) | 4 (1.19) | 10 (2.88) |
| Agree | 140 (38.67) | 63 (15.83) | 15 (3.97) | 31 (9.23) | 124 (35.73) |
| **Small** | | | | | |
| Disagree | 4 (1.10) | 3 (0.75) | 0 (0.00) | 7 (2.08) | (0.00) |
| Uncertain | 5 (1.38) | 8 (2.01) | 3 (0.79) | 6 (1.79) | 1 (0.29) |
| Agree | 64 (17.68) | 118 (29.65) | 44 (11.64) | 152 (45.24) | 68 (19.60) |
| **Semi med** | | | | | |
| Disagree | 2 (0.55) | 9 (2.26) | 1 (0.26) | 5 (1.49) | (0.00) |
| Uncertain | 1 (0.28) | 3 (0.75) | 3 (0.79) | 8 (2.38) | 6 (1.73) |
| Agree | 67 (18.51) | 129 (32.41) | 135 (35.71) | 114 (33.93) | 62 (17.87) |
| **Medium** | | | | | |
| Disagree | 1 (0.28) | (0.00) | 0 (0.00) | 3 (0.89) | 1 (0.29) |

| | | | | | |
|---|---|---|---|---|---|
| Uncertain | 3 (0.83) | 2 (0.50) | 6 (1.59) | 6 (1.79) | 3 (0.86) |
| Agree | 51 (14.09) | 47 (11.81) | 139 (36.77) | 7 (2.08) | 59 (17.00) |
| **Large** | | | | | |
| Disagree | 0 (0.00) | 0 (0.00) | 0 (0.00) | 1 (0.30) | 1 (0.29) |
| Uncertain | 0 (0.00) | 1 (0.25) | 1 (0.26) | 1 (0.30) | 0 (0.00) |
| Agree | 14 (3.87) | 5 (1.26) | 0 (0.00) | 27 (8.04) | 11 (3.17) |
| **Total** | | | | | |
| Disagree | 12 (3.31) | 19 (4.77) | 5 (1.32) | 13 (3.87) | 3 (0.86) |
| Uncertain | 14 (3.87) | 17 (4.27) | 13 (3.44) | 19 (5.65) | 20 (5.76) |
| Agree | 336 (92.82) | 362 (90.95) | 360 (95.24) | 304 (90.48) | 324 (93.37) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

The perceptions seems to vary directly and inversely with the lands held by the farmers in the different states [see Table No. 42 ]. The challenge perhaps before the Programme Managers was to sensitise them on the need to address these issues within their own limited area of operation. It is surprising that the farmers seems to have not got totally convinced about the need to adopt the necessary preventive measures. While this may be reflective of the limited impact of the advisory services, perhaps the programme managers should have evolved other strategies during the implementation towards making the issue very relevant for the farming community as a whole. To that extent either it was not completely a success or the limitations that was involved in adhering to the advisories.

**Table No. 41 : Distribution of Households on Land Holding Size and Perceptions on Technical Information**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Marginal** | | | | | |
| Agree | 39 (10.77) | 24 (6.03) | 0 (0.00) | 3 (0.89) | 5 (1.44) |
| uncertain | 6 (1.66) | 2 (0.50) | 0 (0.00) | 1 (0.30) | 9 (2.59) |
| Disagree | 105 (29.01) | 47 (11.81) | 14 (3.70) | 33 (9.82) | 121 (34.87) |
| **small** | | | | | |
| Agree | 23 (6.35) | 38 (9.55) | 3 (0.79) | 10 (2.98) | 2 (0.58) |
| uncertain | 6 (1.66) | 7 (1.76) | 3 (0.79) | 5 (1.49) | 8 (2.31) |
| Disagree | 44 (12.15) | 84 (21.11) | 41 (10.85) | 150 (44.64) | 59 (17.00) |
| **Semi med** | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Agree | 13 (3.59) | 33 (8.29) | 8 (2.12) | 11 (3.27) | 4 (1.15) |
| uncertain | 8 (2.21) | 13 (3.27) | 3 (0.79) | 6 (1.79) | 3 (0.86) |
| Disagree | 49 (13.54) | 95 (23.87) | 128 (33.86) | 110 (32.74) | 61 (17.58) |
| **medium** | | | | | |
| Agree | 11 (3.04) | 14 (3.52) | 0 (0.00) | 7 (2.08) | 2 (0.58) |
| uncertain | 11 (3.04) | (0.00) | 0 (0.00) | 7 (2.08) | (0.00) |
| Disagree | 33 (9.12) | 35 (8.79) | 134 (35.45) | 7 (2.08) | 61 (17.58) |
| **large** | | | | | |
| Agree | 1 (0.28) | (0.00) | 1 (0.26) | 1 (0.30) | 1 (0.29) |
| uncertain | (0.00) | 1 (0.25) | 0 (0.00) | 2 (0.60) | (0.00) |
| Disagree | 13 (3.59) | 5 (1.26) | 0 (0.00) | 26 (7.74) | 11 (3.17) |
| **Total** | | | | | |
| Agree | 87 (24.03) | 109 (27.39) | 19 (5.03) | 25 (7.44) | 14 (4.03) |
| uncertain | 31 (8.56) | 23 (5.78) | 16 (4.23) | 11 (3.27) | 20 (5.76) |
| Disagree | 244 (67.40) | 266 (66.83) | 343 (90.74) | 300 (89.29) | 313 (90.20) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

A smaller percentage of the respondents across all land holdings and across states have said that the technical information is too technical to understand by the farmers, This may be due to difficulty in interpretation and lack of technical knowledge on certain topics, the change in local dialect form region to region, but utmost care is taken by the experts while preparing the advisory to the farmers.

The above discussions significance on the importance of the advisories on better crop management practices indicates that the majority of farmers were satisfied with the NICE advisory services generated by the scientists. This helped in better management of crop, reduce the crop loss, optimal use inputs such as fertilizer, pesticides etc. This in turn led to the increase in the income to the farmers indirectly.

Excepting one of the issues relating to crop management practices, for all other issues around 50 or even more than that of the farmers have strongly agreed on the relevance of the services provided through NAAS. This is indicative of the following issues:

1. The guidance provided are highly relevant, appropriate and timely.
2. This also speaks of lack of other services for these farmers to aid and guide their agricultural operations.

3. The farmers seems to have rated very highly services provided in the realm of insect and pest management. This could be due to the high cost incurred by them. Perhaps, this might have enabled them to take rational decisions rather than on 'common sense' or guided by 'traditional wisdom'.
4. The only service that they are unable to use completely is that related to shifting the cropping pattern. This is perhaps understandable owing to the technicalities that is involved i.e. the soil type, the weather conditions, adequate information and more importantly knowledge on the newer crop, accessibility to the market or market uncertainties etc.,

### 3.4.2) Impact of Market information

To capture the impact of market information it was decided to employ five items by thoroughly checking the studies on impact of digital interventions. This parameter encompasses various nuances on market information which constitutes a total of five items which are rated on five point continuum.

Under this broad grouping, farmers were asked to indicate their opinions on information relating to the pricing of the inputs, the availability as also the pricing for the final agricultural produce.

The table displays the impact on market information. A great deal of respondents have strongly agreed on the statements. Nearly half of the respondents strongly agreed on NAAS services which has been helpful in deciding the better market and fifty percent agreed that NAAS provides better opportunity for purchasing quality inputs at fair prices.

**Table No. 42 : Distribution of Households on Perceptions on Impact of Market Information**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **NAAS provides all the market prices of the different farm produce to the farmers** | | | | | |
| **Disagree** | 6 (1.66) | 17 (4.27) | 1 (0.26) | 3 (0.89) | 0 (0.00) |
| **Undecided** | 10 (2.76) | 15 (3.77) | 12 (3.17) | 16 (4.76) | 58 (16.71) |
| **Agree** | 191 (52.76) | 212 (53.27) | 192 (50.79) | 166 (49.40) | 242 (69.74) |
| **Strongly Agree** | 155 (42.82) | 154 (38.69) | 173 (45.77) | 151 (44.94) | 47 (13.54) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| **The farmer can select better market for their produce due to NAAS** | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| **Disagree** | 13 (3.59) | 22 (5.53) | 4 (1.06) | 8 (2.38) | 0 (0.00) |
| **Undecided** | 21 (5.80) | 23 (5.78) | 22 (5.82) | 14 (4.17) | 20 (5.76) |
| **Agree** | 190 (52.49) | 209 (52.51) | 189 (50.00) | 174 (51.79) | 196 (56.48) |
| **Strongly Agree** | 138 (38.12) | 144 (36.18) | 163 (43.12) | 140 (41.67) | 131 (37.75) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| **NAAS provides better opportunity for purchasing quality inputs at fair prices** | | | | | |
| **Disagree** | 11 (3.04) | 20 (5.03) | 6 (1.59) | 14 (4.17) | 6 (1.73) |
| **Undecided** | 17 (4.70) | 15 (3.77) | 15 (3.97) | 31 (9.23) | 50 (14.41) |
| **Agree** | 189 (52.21) | 208 (52.26) | 215 (56.88) | 155 (46.13) | 165 (47.55) |
| **Strongly Agree** | 145 (40.06) | 155 (38.94) | 142 (37.57) | 136 (40.48) | 126 (36.31) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| **Farmers become aware about the malpractices at the market yard due to NAAS** | | | | | |
| **Disagree** | 16 (4.42) | 35 (8.79) | 5 (1.32) | 20 (5.95) | 0 (0.00) |
| **Undecided** | 29 (8.01) | 29 (7.29) | 17 (4.50) | 11 (3.27) | 9 (2.59) |
| **Agree** | 119 (32.87) | 148 (37.19) | 223 (58.99) | 230 (68.45) | 266 (76.66) |
| **Strongly Agree** | 198 (54.70) | 186 (46.73) | 133 (35.19) | 75 (22.32) | 72 (20.75) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| **Agricultural Input prices and their availability etc., information is also provided through NAAS** | | | | | |
| **Disagree** | 4 (1.10) | 20 (5.03) | 4 (1.06) | 16 (4.76) | 6 (1.73) |
| **Undecided** | 13 (3.59) | 16 (4.02) | 15 (3.97) | 25 (7.44) | 63 (18.16) |
| **Agree** | 197 (54.42) | 228 (57.29) | 246 (65.08) | 212 (63.10) | 162 (46.69) |
| **Strongly Agree** | 148 (40.88) | 134 (33.67) | 113 (29.89) | 83 (24.70) | 116 (33.43) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

It could be discerned from the above table that more than 90 per cent of the respondents agreed "NAAS provides all the market prices of the different farm produce to the farmers" The advisories are prepared by following the prevailing market price and minimum support given by the CACP from time to time. However, nearly a fifth of the respondents in Telangana do not concur that all the required information is provided through the services. This may be perhaps due to the geographical factors.

A great deal of respondents felt that "The farmer can select better market for their produce due to NAAS". This is because they are getting the up to date information on the best available sources of market in their proximity and meagre portion of the respondents not agreed to it.

As could be observed form the table about 90 per cent of the respondents felt that "NAAS provides better opportunity for purchasing quality inputs at fair prices". This could be due to the fact that farmers are receiving advisory on the quality inputs and where they can purchase those inputs.

About 80 per cent or little more of the farmers expressed that they are aware about the malpractices at the market yard due to NAAS. This is quite plausible that the information on the prices offered by the middle men or brokers reach to the farmers through various informal or non-kin networks. With the availability of the information on the prices that exist in the market, the farmers are able to compare and thus, understand the forces at play. Perhaps, the farmers do have these understandings since sometime through the radio, doordarshan and it has become easily available now on their own phones. Thus, they may be more speaking in terms of accessing the available

information. Perhaps, the greater frequency at which these information are fed to the farmers, they would have found it more beneficial. Notwithstanding this, the problems in accessing these markets remain the same.

From the table it could be seen that about 90 percent of them felt that they are getting Agricultural Input prices and their availability etc through the NICE, the experts are making advisories by capturing the various pesticides and fertilizer prices in the market.

Overall it can be summarized that farmers are very satisfied with the information provided by the NICE services. This could be helping them in wisely marketing their produce thereby helping in fetching better price.

**Table No. 43 : Farmers awareness about the NAAS Services**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Information Provided under NICE is clearly understandable** | | | | | |
| Disagree | 5 (1.38) | 10 (2.51) | 1 (0.26) | 0 (0.00) | 0 (0.00) |
| undecided | 10 (2.76) | 9 (2.26) | 4 (1.06) | 19 (5.65) | 32 (9.22) |
| Agree | 95 (26.24) | 107 (26.88) | 155 (41.01) | 128 (38.10) | 251 (72.33) |
| Strongly Agree | 252 (69.61) | 272 (68.34) | 218 (57.67) | 189 (56.25) | 64 (18.44) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| **NICE Provides Time Based Information** | | | | | |
| Disagree | 9 (2.49) | 25 (6.28) | 0 (0.00) | 3 (0.89) | 0 (0.00) |

| | | | | | |
|---|---|---|---|---|---|
| undecided | 13 (3.59) | 9 (2.26) | 22 (5.82) | 25 (7.44) | 43 (12.39) |
| Agree | 97 (26.80) | 124 (31.16) | 139 (36.77) | 137 (40.77) | 229 (65.99) |
| Strongly Agree | 243 (67.13) | 240 (60.30) | 217 (57.41) | 171 (50.89) | 75 (21.61) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| **NICE Provides Need Based Information** | | | | | |
| Disagree | 5 (1.38) | 10 (2.51) | 5 (1.32) | 14 (4.17) | 2 (0.58) |
| undecided | 14 (3.87) | 24 (6.03) | 12 (3.17) | 28 (8.33) | 20 (5.76) |
| Agree | 94 (25.97) | 121 (30.40) | 116 (30.69) | 102 (30.36) | 168 (48.41) |
| Strongly Agree | 249 (68.78) | 243 (61.06) | 245 (64.81) | 192 (57.14) | 157 (45.24) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| **NICE Services Save Time and Money** | | | | | |
| Disagree | 5 (1.38) | 19 (4.77) | 9 (2.38) | 19 (5.65) | 3 (0.86) |
| undecided | 17 (4.70) | 16 (4.02) | 18 (4.76) | 17 (5.06) | 31 (8.93) |
| Agree | 121 (33.43) | 125 (31.41) | 99 (26.19) | 107 (31.85) | 181 (52.16) |
| Strongly Agree | 219 (60.50) | 238 (59.80) | 252 (66.67) | 193 (57.44) | 132 (38.04) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| **NICE services promotes increase in Knowledge** | | | | | |
| Disagree | 12 (3.31) | 25 (6.28) | 6 (1.59) | 18 (5.36) | 1 (0.29) |
| undecided | 22 (6.08) | 24 (6.03) | 19 (5.03) | 9 (2.68) | 13 (3.75) |
| Agree | 106 (29.28) | 130 (32.66) | 99 (26.19) | 127 (37.80) | 239 (68.88) |
| Strongly Agree | 222 (61.33) | 219 (55.03) | 254 (67.20) | 182 (54.17) | 94 (27.09) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| **NICE services promotes increase in Productivity** | | | | | |
| Disagree | 7 (1.93) | 15 (3.77) | 6 (1.59) | 14 (4.17) | (0.00) |
| undecided | 14 (3.87) | 19 (4.77) | 19 (5.03) | 22 (6.55) | 27 (7.78) |
| Agree | 108 (29.83) | 143 (35.93) | 209 (55.29) | 151 (44.94) | 188 (54.18) |
| Strongly Agree | 233 (64.36) | 221 (55.53) | 144 (38.10) | 149 (44.35) | 132 (38.04) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| **Information provided by NICE Service is Adaptable in Field Conditions** | | | | | |
| Disagree | 9 (2.49) | 22 (5.53) | 8 (2.12) | 20 (5.95) | 7 (2.02) |
| undecided | 17 (4.70) | 19 (4.77) | 18 (4.76) | 10 (2.98) | 10 (2.88) |
| Agree | 98 (27.07) | 132 (33.17) | 116 (30.69) | 112 (33.33) | 164 (47.26) |
| Strongly Agree | 238 (65.75) | 225 (56.53) | 236 (62.43) | 194 (57.74) | 166 (47.84) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

| | | | | | |
|---|---|---|---|---|---|
| **The Advisory Services in the form of Posters are Understandable, Useful and Effective** | | | | | |
| Disagree | 8 (2.21) | 15 (3.77) | 6 (1.59) | 13 (3.87) | (0.00) |
| undecided | 20 (5.52) | 14 (3.52) | 19 (5.03) | 16 (4.76) | 11 (3.17) |
| Agree | 97 (26.80) | 126 (31.66) | 118 (31.22) | 112 (33.33) | 196 (56.48) |
| Strongly Agree | 237 (65.47) | 243 (61.06) | 235 (62.17) | 195 (58.04) | 140 (40.35) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| **The Advisory Services in the form of Video Links are Understandable, Useful and Effective** | | | | | |
| Disagree | 6 (1.66) | 22 (5.53) | 7 (1.85) | 20 (5.95) | 4 (1.15) |
| undecided | 13 (3.59) | 14 (3.52) | 9 (2.38) | 15 (4.46) | 18 (5.19) |
| Agree | 100 (27.62) | 125 (31.41) | 123 (32.54) | 110 (32.74) | 171 (49.28) |
| Strongly Agree | 243 (67.13) | 237 (59.55) | 239 (63.23) | 191 (56.85) | 154 (44.38) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| **The Advisory Services in the form of SMS are Understandable, Useful and Effective** | | | | | |
| Disagree | 7 (1.93) | 9 (2.26) | 3 (0.79) | 7 (2.08) | (0.00) |
| undecided | 12 (3.31) | 14 (3.52) | 7 (1.85) | 9 (2.68) | 6 (1.73) |
| Agree | 99 (27.35) | 138 (34.67) | 114 (30.16) | 107 (31.85) | 149 (42.94) |
| Strongly Agree | 244 (67.40) | 237 (59.55) | 254 (67.20) | 213 (63.39) | 192 (55.33) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

### Information provided is Clearly Understandable

Excepting the state of Telangana, in all the other states, about 50-60 per cent of the farmers have strongly said that the messages are understandable. Further, about a fourth have said they 'agree' that it is understandable. The highest no. of farmers reporting so is from the state of Telangana [72.33%]. A very small percentage in states such as Andhra Pradesh, Chhattisgarh, Odisha have expressed difficulties in understanding the messages.

Thus, in other words, thee perceptions are echoed in the perceptions on the economic impacts of the programme as well.

### It Provides Time and Need Based Information

The general feeling seems to be that the services provided is not only relevant in terms of time sequence, but is also need based. Thus, in the state of Andhra Pradesh 93.93 per cent have said that the services are very much timely [Strongly Agree]. On the other hand, in the state of Telangana, 65.99 per cent have agreed on the timeliness of the services. Notwithstanding the variations, the farmers' have expressed satisfaction on the timeliness of the services.

Similar opinions have also been expressed as regards the need for the services. This perhaps is a reflection of the objective of the programme as well.

**NAAS Services Saves Time and Money**

The advisory services are made available to the programme beneficiaries through SMS, audio, video links and documents. It is also provided in a language of their choice. When it is so, about 10 per cent of the farmers from the state of Odisha and Telangana do not concern that the services are resulting in great savings – both time and money. But 80-90 per cent have said that these services are resulting in the savings. This could be the relative advantage as compared to the programmes that are broadcast through radio and doordarshan. It may be for the same reasons that many might have opted to join the programme as well.

A similar feeling or opinions are also expressed as regards its role in enhancing the Knowledge, increasing the productivity and adaptability to the field conditions. It must be noted that the advisory services were highly researched pieces of information which would greatly benefit the farmers. Hence, it is but natural that the beneficiaries are echoing a similar feeling.

The strategies such as the posters, video links and the SMS have also been greatly appreciated. All these strategies have the power to equip the user with information, examine its relevance in his / her context and if need be follow it up with discussions and use the same in his agricultural practices This is slightly different from the current 'phone in programmes' broadcasted through the AIR and Doordarshan. However, they are beset with their own limitations.

## 3.4.3) Psychological Impact

The current study has attempted at capturing the impact of the programmes on the psychological and the economic aspects. The psychological factors assume importance for the simple reason that the medium selected for disseminating the information as against the conventional methods is the digital technology. The immediate implication of this is that the individual will have to receive the information, understand it, interpret it and if need be collect additional information through the various links to enable one to adopt the same. Thus, the individuals attitude has a decisive influence on the programme. Hence, this analysis.

The psychological impact of NICE services is measured by three items through a five point scale.

A great majority of the farmers expressed that NICE services has motivated the farmers to adopt new technologies and the services has also helped them in the decision making process and by using these services the farmers are able to acquire the crop related information from various extension agencies eventually making them 'knowledge full '.

**Table No.44 : Distribution of Perception on Psychological Impact of NAAS**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **NAAS facilitates decision making of farmers about various agricultural operations** | | | | | |
| **Disagree** | 1 (0.28) | 3 (0.75) | 1 (0.26) | 1 (0.30) | 0 (0.00) |
| **Undecided** | 16 (4.42) | 35 (8.79) | 8 (2.12) | 17 (5.06) | 56 (16.14) |
| **Agree** | 201 (55.52) | 186 (46.73) | 189 (50.00) | 169 (50.30) | 245 (70.61) |
| **Strongly Agree** | 144 (39.78) | 174 (43.72) | 180 (47.62) | 149 (44.35) | 46 (13.26) |
| **Farmers get motivated to visit the Krishi vignana Kendra/research centres willingly for seeking detailed information on new technologies** | | | | | |
| **Disagree** | 9 (2.49) | 14 (3.52) | 5 (1.32) | 8 (2.38) | 0 (0.00) |
| **Undecided** | 17 (4.70) | 32 (8.04) | 37 (9.79) | 25 (7.44) | 72 (20.75) |
| **Agree** | 201 (55.52) | 209 (52.51) | 267 (70.63) | 201 (59.82) | 130 (37.46) |
| **Strongly Agree** | 135 (37.29) | 143 (35.93) | 69 (18.25) | 102 (30.36) | 145 (41.79) |
| **NAAS motivates the farmers to adopt agricultural technologies** | | | | | |
| **Disagree** | 11 (3.04) | 14 (3.52) | 5 (1.32) | 14 (4.17) | 0 (0.00) |
| **Undecided** | 18 (4.97) | 25 (6.28) | 12 (3.17) | 21 (6.25) | 18 (5.19) |
| **Agree** | 189 (52.21) | 189 (47.49) | 118 (31.22) | 121 (36.01) | 209 (60.23) |
| **Strongly Agree** | 144 (39.78) | 170 (42.71) | 243 (64.29) | 180 (53.57) | 120 (34.58) |

The figures in the above table reveals the psychological impact of the NICE services on them with respect to farming. A great majority of the farmers opined that "NAAS facilitates decision making of farmers about various agricultural operations". This is because the farmers are getting timely and location specific advices on what to do and when to do. These advices are created based on the calendar of operations for the specific crop. The only exception is that from the state of Telangana. More than 15 per cent have not indicated their opinions.

The farmers are motivated to visit KVKs and research stations for seeking detailed information because the information that delivered through NICE is very limited as all the required information cannot be sent in the message form. A smaller percentage across the States have disagreed on this.

It may be for a number of reasons. Nearly half of the respondents strongly agreed that nice services motivates the farmers to adopt agricultural technologies. The reason might be the advisories they received are more relevant to them and also easily understood by the farmers. They are appealing and finally enabling them to adopt it. It is important to note that a smaller percentage are 'undecided' as regards its adoption. The programme design ought to have helped the farmers' in this regard.

### 3.4.4) Economic Impact

For exploring the economic impact of the NAAS advisory services, eight items were employed to gauge the perception of the farmers to assess the nature and extent of the impacts as a result of the NICE services. To help the respondents indicate their perceptions well, the five point rating scale was used. The findings from the exercise are discussed in the following sections.

It is evident from the above table the services has impacted the farmers economically, nearly half of the farmers strongly agreed that nice services help in reducing the number of sprays thereby directly reducing the cost of cultivation and these services also helped in proper management of inputs and irrigation eventually making them profitable by decreasing the cultivation costs.

The perceptions across the issues is not found to vary greatly. Hence, for illustrative purposes few of them have been taken up for discussions.

**Table No. 45 : Distribution on Perceptions relating to the Economic Impact of NAAS Across States**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **NAAS help farmers in effective planning of plant protection measures** | | | | | |
| Strongly Disagree | **0 (0.00)** | 0 (0.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| Disagree | **5 (1.38)** | 7 (1.76) | 0 (0.00) | 2 (0.60) | 0 (0.00) |
| Undecided | **19 (5.25)** | 9 (2.26) | 9 (2.38) | 8 (2.38) | 10 (2.88) |
| Agree | **119 (32.87)** | 143 (35.93) | 172 (45.50) | 177 (52.68) | 289 (83.29) |
| Strongly Agree | **219 (60.50)** | 239 (60.05) | 197 (52.12) | 149 (44.35) | 48 (13.83) |

| | | | | | |
|---|---|---|---|---|---|
| **Proper input management reduces economic losses of the farmers** | | | | | |
| Strongly Disagree | **0 (0.00)** | 0 (0.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| Disagree | **9 (2.49)** | 25 (6.28) | 6 (1.59) | 11 (3.27) | 0 (0.00) |
| undecided | **18 (4.97)** | 20 (5.03) | 17 (4.50) | 14 (4.17) | 8 (2.31) |
| Agree | **114 (31.49)** | 120 (30.15) | 140 (37.04) | 124 (36.90) | 227 (65.42) |
| Strongly Agree | **221 (61.05)** | 233 (58.54) | 215 (56.88) | 187 (55.65) | 112 (32.28) |
| **NAAS reduces frequency of sprays in crops** | | | | | |
| Strongly Disagree | **0 (0.00)** | 0 (0.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| Disagree | **7 (1.93)** | 17 (4.27) | 3 (0.79) | 11 (3.27) | 2 (0.58) |
| Undecided | **15 (4.14)** | 17 (4.27) | 23 (6.08) | 31 (9.23) | 64 (18.44) |
| Agree | **176 (48.62)** | 181 (45.48) | 151 (39.95) | 103 (30.65) | 169 (48.70) |
| Strongly Agree | **164 (45.30)** | 183 (45.98) | 201 (53.17) | 191 (56.85) | 112 (32.28) |
| **Proper technical guidance through NAAS lessens economic burden of farmers** | | | | | |
| Strongly Disagree | **0 (0.00)** | 0 (0.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| Disagree | **11 (3.04)** | 21 (5.28) | 4 (1.06) | 20 (5.95) | 0 (0.00) |
| undecided | **17 (4.70)** | 18 (4.52) | 15 (3.97) | 19 (5.65) | 51 (14.70) |
| Agree | **140 (38.67)** | 131 (32.91) | 128 (33.86) | 100 (29.76) | 145 (41.79) |
| Strongly Agree | **194 (53.59)** | 228 (57.29) | 231 (61.11) | 197 (58.63) | 151 (43.52) |
| **Proper irrigation management reduces economic issues of farmers** | | | | | |
| Strongly Disagree | 0 (0.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| Disagree | 13 (3.59) | 29 (7.29) | 9 (2.38) | 17 (5.06) | 4 (1.15) |
| undecided | 101 (27.90) | 77 (19.35) | 19 (5.03) | 12 (3.57) | 19 (5.48) |
| Agree | 163 (45.03) | 190 (47.74) | 245 (64.81) | 241 (71.73) | 237 (68.30) |
| Strongly Agree | 85 (23.48) | 102 (25.63) | 105 (27.78) | 66 (19.64) | 87 (25.07) |
| **NAAS can help in better economic returns which results in uplifting the standard of living of the farmers** | | | | | |
| Strongly Disagree | 0 (0.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| Disagree | 6 (1.66) | 12 (3.02) | 6 (1.59) | 12 (3.57) | 0 (0.00) |
| Undecided | 23 (6.35) | 19 (4.77) | 16 (4.23) | 17 (5.06) | 18 (5.19) |
| Agree | 133 (36.74) | 149 (37.44) | 170 (44.97) | 115 (34.23) | 176 (50.72) |

| | | | | | |
|---|---|---|---|---|---|
| Strongly Agree | 200 (55.25) | 218 (54.77) | 186 (49.21) | 192 (57.14) | 153 (44.09) |
| **Farmers can get benefit from the Crop Insurance schemes and Subsidy for Government schemes** | | | | | |
| Strongly Disagree | 0 (0.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| Disagree | 39 (10.77) | 36 (9.05) | 6 (1.59) | 14 (4.17) | 4 (1.15) |
| Undecided | 91 (25.14) | 61 (15.33) | 21 (5.56) | 23 (6.85) | 30 (8.65) |
| Agree | 156 (43.09) | 212 (53.27) | 285 (75.40) | 244 (72.62) | 237 (68.30) |
| Strongly Agree | 76 (20.99) | 89 (22.36) | 66 (17.46) | 55 (16.37) | 76 (21.90) |

The plant protection measures seems to be a matter of great concern to the farmers. This is in view of the considerable amount of their investments both human and financial in the whole of the agricultural operations. Around 5 per cent of the farmers are undecided on the issue. It is the highest in Andhra Pradesh. On the contrary, they seem to agree / strongly agree that it has helped in 'planning' for plant protection measures. About 95 per cent of the respondents in all the districts have concurred on this. Perhaps, this is a direct reflection of the timing of the messages through the NAAS services.

An equal portion have strongly agreed that they have reduced the number of sprays which could be due to timely diagnosis of the pests and timely spray and thus, finally resulting in reduced number of sprays and hence, the savings.

Majority of the farmers felt that proper technical guidance helped them in reducing the economic losses,. There is a saying that prevention is better than cure the early prognosis will result in taking the timely actions.

About 90 percent have either strongly agreed or agreed to the proposition that they are getting better economic returns and raising the standard of living. The farmers are adopting the advices and management practices on time and they are reducing the unwanted losses and wastage. As they are getting first hand market intelligence through the NICE services, this is said to be resulting in fetching better prices and better returns for their labour.

It is found from the Table that 60-80 percent of the farmers expressed they are well informed about the govt schemes and crop insurance. This is so across the States. The advisories are sent which provides the updated information on the government schemes and they are also sensitized about the utility of crop insurance. Farmers need to be shielded from the uncertainties, the advisories crop insurance and various schemes taken by then government are helping the famers a lot. A good

percentage have indicated their opinion to be 'uncertain'. This is perhaps indicative of their mindset and the difficulties that they encounter in accessing the services from the companies.

**Psychological Impact and the Economic Impact**

The different levels of analysis and the discussions in the field revealed that the continued interactions and the interface between the NAAS advisory services and the farmers has resulted in a psychological impact. The farmers have reached a stage wherein they look upto these advisories before they embark on anything in their fields. Thus, the relationship is two fold. On the other hand, in terms of economic impact, a third actor or institution creeps in i.e. the market. In fact, it is this the average farmer has been struggling with. Here the role of the NAAS advisory services is found to be very formal ie. by way of guiding based on the information available. As a result, the farmer ought not to have established that strong a relationship as far as the economic aspects are considered.

In the following section, an attempt is made to analyse the relationship between one of the psychological aspects and two of the economic aspects. The analysis is expected to provide better insights into the impacts of the programme as well.

**Table no. 46 : Distribution of households on facilitating role of the Naas in different agricultural operations and reduces frequency of sprays**

| | Strongly Disagree | Disagree | Undecided | Agree | Strongly Agree | Total |
|---|---|---|---|---|---|---|
| **Andhra Pradesh** | | | | | | |
| Disagree | 0 | 0 | 0 | 1(100) | 0 | 1(100) |
| Undecided | 0 | 0 | 0 | 7(43.75) | 9(56.25) | 16(100) |
| Agree | 0 | 11 | 10 | 99(49.25) | 81(40.30) | 201(100) |
| Strongly Agree | 0 | 0 | 7(4.86) | 33(22.92) | 104(72.22) | 144(100) |
| **Chhattisgarh** | | | | | | |
| Disagree | 0 | 0 | 1(33.33) | 1(33.33) | 1(33.33) | 3(100) |
| Undecided | 0 | 1(2.86) | 0 | 12(34.29) | 22(62.86) | 35(100) |
| Agree | 0 | 18(9.68) | 7(3.76) | 86(46.24) | 75(40.32) | 186(100) |
| Strongly Agree | 0 | 2(1.15) | 10(5.75) | 32(18.39) | 130(74.71) | 174(100) |
| **Karnataka** | | | | | | |
| Disagree | 0 | 0 | 0 | 1(100) | 0 | 1(100) |
| Undecided | 0 | 0 | 1(12.5) | 1(12.5) | 6(75) | 8(100) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Agree | 0 | 4(2.12) | 10(5.29) | 93(49.21) | 82(43.39) | 189(100) |
| Strongly Agree | 0 | 0 | 4(2.22) | 33(18.33) | 143(79.44) | 180(100) |
| **Odisha** | | | | | | |
| Disagree | 0 | 1(100) | 0 | 0 | 0 | 1(100) |
| Undecided | 0 | 2(11.76) | 3(17.65) | 8(47.06) | 4(23.53) | 17(100) |
| Agree | 0 | 17(10.06) | 13(7.69) | 84(49.70) | 55(32.54) | 169(100) |
| Strongly Agree | 0 | 0 | 3(2.01) | 8(5.37) | 138(92.62) | 149(100) |
| **Telangana** | | | | | | |
| Disagree | 0 | 0 | 0 | 0 | 0 | 0 |
| Undecided | 0 | 31(55.36) | 17(30.36) | 8(14.29) | 0 | 56(100) |
| Agree | 0 | 20(8.16) | 128(52.84) | 97(39.59) | 0 | 245(100) |
| Strongly Agree | 0 | 0 | 0 | 46(100) | 0 | 46(100) |

In the state of Telangana, as regards the psychological impact – facilitates decision making of farmers about various agricultural operations – the two highly category of responses are agree' and 'undecided'. Of those who have agreed, only 39.59 per cent have expressed on agreement relating to the lessened burden as a result of the technical guidance. About 52.24 per cent are largely undecided, while 8.16 per cent have disagreed on that count. Among those who have expressed it as 'undecided', 55.36 per cent have disagreed on the envisaged economic impacts and 30.36 per cent are uncertain about it. In the state of Odisha, of those who are reported to be highly motivated as a result of the advisory services, more than 90 per cent have also strongly agreed on the economic impacts. Of those who have only agreed on the psychological impacts, about 81 per cent have either agreed or strongly agreed on the economic impacts as well. Thus, they seem to have expressed confidence in lessening their economic losses as well.

In all the three states of Andhra Pradesh, Chhattisgarh and Karnataka, of those expressing only 'agreement' on the psychological impacts, a good percentage of them have expressed very strongly on the economic impacts. This is about 40 per cent. But on the other hand, of those who have expressed very strongly on the psychological, have also expressed very strongly on the economic impacts as well. This is true of Odisha as well. Relationship Between The Facilitating Role Of The Naas In Different Agricultural Operations And Better Economic Returns Resulting In Uplifting The Standard Of Living Of The Farmers

**Table No. 47. Distribution of Households on Perceptions Relating to the Facilitating Role of the NAAS in Different Agricultural Operations and Increased Economic Development of the Farmers**

| | Disagree | Undecided | Agree | Strongly Agree | Total |
|---|---|---|---|---|---|
| **Andhra Pradesh** | | | | | |
| Disagree | 0 | 0 | 1(100) | 0 | 1(100) |
| Undecided | 0 | 0 | 6(37.5) | 10(62.5) | 16(100) |
| Agree | 4(1.99) | 11(5.47) | 83(41.29) | 103(51.24) | 201(100) |
| Strongly Agree | 2(1.39) | 12(8.33) | 43(29.86) | 87(60.42) | 144(100) |
| **Total** | 6(1.657) | 23(6.35) | 133(36.74) | 200(55.24) | 362(100) |
| **Chhattisgarh** | | | | | |
| Disagree | 1(33.33) | 0 | 2(66.67) | 0 | 3(100) |
| Undecided | 1(2.86) | 1(2.86) | 5(14.29) | 28(80) | 35(100) |
| Agree | 10(5.38) | 13(6.99) | 84(45.16) | 79(42.47) | 186(100) |
| Strongly Agree | 0 | 5(2.87) | 58(33.33) | 111(63.79) | 174(100) |
| **Total** | 12(3.01) | 19(4.77) | 149(37.43) | 218(54.77) | 398(100) |
| **Karnataka** | | | | | |
| Disagree | 0 | 1(100) | 0 | 0 | 1(100) |
| undecided | 0 | 2(25) | 1(12.5) | 5(62.5) | 8(100) |
| Agree | 6(3.17) | 13(6.88) | 109(57.67) | 61(32.28) | 189(100) |
| Strongly Agree | 0 | 0 | 60(33.33) | 120(66.67) | 180 |
| **Total** | 6(1.58) | 16(4.23) | 170(44.97) | 186(49.20) | 378(100) |
| **Odisha** | | | | | |
| Disagree | 0 | 0 | 1(100) | 0 | 1(100) |
| undecided | 1(5.88) | 2(11.76) | 2(11.76) | 12(70.59) | 17(100) |
| Agree | 7(4.14) | 15(8.88) | 98(57.99) | 49(28.99) | 169(100) |
| Strongly Agree | 4(2.68) | 0 | 14(9.4) | 131(87.92) | 149(100) |
| **Total** | 12(3.57) | 17(5.05) | 115(34.22) | 192(57.14) | 336(100) |
| **Telangana** | | | | | |
| undecided | 6(10.71) | 31(55.36) | 19(33.93) | 0 | 56(100) |
| Agree | 12(4.9) | 141(57.55) | 92(37.55) | 0 | 245(100) |
| Strongly Agree | 0 | 4(8.7) | 42(91.3) | 0 | 46(100) |
| **Total** | 18(5.18) | 176(50.72) | 153(44.09) | 0 | 347(100) |

The relationship between the two is found to be weak. This is so because even of those who have not agreed on the relevance of the facilitating role, is found to agree that these services will result in improved or standard of living or the economic development of the farmers. This may be due to the fact that these advisories are related to various aspects of agriculture viz., agricultural operations, climate, market information etc., Thus, it is found that perhaps together as a whole the programme will result in the economic development of the farmers. This is true across the states.

Thus, this seems to point out that the psychological and economic impacts are to a very great extent mutually inclusive, yet psychological aspects influencing the other aspects. Hence, it becomes important that the programme aims at enhancing the psychological impacts, before it can expect increased economic impacts which perhaps is found to be very much 'auto'. This very much brings in the role of the various interventions and perhaps the role of the CRP as well.

**Table No. 48: Distribution of Households on Perceptions on Enhanced Skills Related to Farming and Enhanced Incomes Across States**

| | Andhra | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Enhanced Skills Related to Farming** | | | | | |
| **Disagree** | 4 (1.10) | 2 (0.50) | 2 (0.53) | 0 (0.00) | 0 (0.00) |
| **Undecided** | 14 (3.87) | 22 (5.53) | 0 (0.00) | 8 (2.38) | 0 (0.00) |
| **Agree** | 143 (39.50) | 194 (48.74) | 185 (48.94) | 183 (54.46) | 304 (87.61) |
| **Strongly Agree** | 201 (55.52) | 180 (45.23) | 191 (50.53) | 145 (43.15) | 43 (12.39) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| **Enhanced Income** | | | | | |
| **Disagree** | 3 (0.83) | 2 (0.50) | 1 (0.26) | 3 (0.89) | 0 (0.00) |
| **Undecided** | 16 (4.42) | 34 (8.54) | 8 (2.12) | 19 (5.65) | 6 (1.73) |
| **Agree** | 138 (38.12) | 195 (48.99) | 165 (43.65) | 162 (48.21) | 301 (86.74) |
| **Strongly Agree** | 205 (56.63) | 167 (41.96) | 204 (53.97) | 152 (45.24) | 40 (11.53) |
| **Total** | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

**Enhanced Income**

Nearly 40-50 pre cent of the farmers have 'strongly agreed'that the programme has resulted in enhanced income to them. The highest no. of farmers reporting is from the state of Andhra Pradesh [56.63%] and Karnataka [53.97%]. It is only 11.53 per cent from the state of Telengana. A good percentage of the farmres have also expressed their agreement to the enhanced incomes. Thus, almost about 90 per centn have agreed on the enhanced incomes as a result of the programme.

**Ehanced Skills Related to Farming**

It is interesting to note that about 90 per cent of the farmers from all the 5 states have agreed that the benefit of the programme is the enhanced skills related to the farming. Thus, it may be these enhanced skill sets which has given rise to the enhanced incomes to the households. This is indicative of the good packaging of the programme or the services

## 3.4.5) Constraints faced by Farmers during the use of NICE

**Table No. 49. Constraints encountered by respondents during the use of NICE agro advisory (NAAS)**

| | Andhra Pradesh | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| Complex information delivered through SMS | | | | | |
| No | 309 (85.36) | 328 (82.41) | 335 (88.62) | 281 (83.63) | 340 (97.98) |
| Yes | 53 (14.64) | 70 (17.59) | 43 (11.38) | 55 (16.37) | 7 (2.02) |
| Total | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| Irregularity in delivering weather advisory services | | | | | |
| No | 317 (87.57) | 343 (86.18) | 348 (92.06) | 288 (85.71) | 335 (96.54) |
| Yes | 45 (12.43) | 55 (13.82) | 30 (7.94) | 48 (14.29) | 12 (3.46) |
| Total | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| Lack of knowledge about new technologies | | | | | |
| No | 304 (83.98) | 337 (84.67) | 349 (92.33) | 235 (69.94) | 111 (31.99) |
| Yes | 58 (16.02) | 61 (15.33) | 29 (7.67) | 101 (30.06) | 236 (68.01) |
| Total | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| Lack of knowledge about market information through NAAS | | | | | |
| No | 293 (80.94) | 360 (90.45) | 342 (90.48) | 231 (68.75) | 86 (24.78) |

| | | | | | |
|---|---|---|---|---|---|
| Yes | 69 (19.06) | 38 (9.55) | 36 (9.52) | 105 (31.25) | 261 (75.22) |
| Total | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| Unaware about government schemes | | | | | |
| No | 317 (87.57) | 353 (88.69) | 332 (87.83) | 217 (64.58) | 85 (24.50) |
| Yes | 45 (12.43) | 45 (11.31) | 46 (12.17) | 119 (35.42) | 262 (75.50) |
| Total | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| Unaware about benefits of SMS advisory services | | | | | |
| No | 328 (90.61) | 357 (89.70) | 350 (92.59) | 235 (69.94) | 102 (29.39) |
| Yes | 34 (9.39) | 41 (10.30) | 28 (7.41) | 101 (30.06) | 245 (70.61) |
| Total | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

The above table reveals that only a smaller percentage of the respondents across the states have referred to some or many of the problems listed. This very well points out the fact that NICE advisory services provided through the digital technology was not only unique, but has been successful in living up to the needs and expectations of the farming community.

### 3.4.6) Suggestions Provided by the Respondents to Overcome the Constraints

**Improved Network and Connectivity in Villages**

A large no. of respondents from the states of Odisha and Telangana have suggested for better network and connectivity in the villages. This has been suggested by 78.57 per cent in Odisha and 88.18 per cent in Telangana. In the 3 other states, about 40 per cent have demanded for improvements in this regard. Thus, this calls for all those involved in the commissioning and maintenance of the network services to be involved in the programme.

**Table No. 50. Suggestions Provided by the Respondents to Overcome the Constraints**

| | Andhra | Chhattisgarh | Karnataka | Odisha | Telangana |
|---|---|---|---|---|---|
| **Improved Network and Connectivity in Villages** | | | | | |
| No | 222 (61.33) | 269 (67.59) | 196 (51.85) | 72 (21.43) | 41 (11.82) |
| Yes | 139 (38.40) | 127 (31.91) | 182 (48.15) | 264 (78.57) | 306 (88.18) |
| Total | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| **Provide Accurate and Timely Market Information** | | | | | |
| No | 308 (85.08) | 331 (83.17) | 303 (80.16) | 203 (60.42) | 61 (17.58) |
| Yes | 54 (14.92) | 66 (16.58) | 75 (19.84) | 133 (39.58) | 286 (82.42) |
| Total | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |
| **Organize Awareness Programmes** | | | | | |
| No | 314 (86.74) | 315 (79.15) | 306 (80.95) | 218 (64.88) | 59 (17.00) |
| Yes | 48 (13.26) | 80 (20.10) | 71 (18.78) | 118 (35.12) | 288 (83.00) |
| Total | 362 (100.00) | 398 (100.00) | 378 (100.00) | 336 (100.00) | 347 (100.00) |

**Organize Awareness Programmes**

A small percentage of the respondents have suggested for awareness programmes to help the farming community in availing the services. About 83 per cent of the respondents from Telangana have suggested for the same. The same could be considered under the programme as well.

**Provide Accurate and Timely Market Information**

A good percentage of the respondents from Odisha and Telangana have sought for improvements in this regard [see Table No. 50]. However, it must be noted that the current services are addressing to this as well. The Programme Managers may think of appropriate improvements in this regard.

# CONCLUSION AND RECOMMENDATIONS

The study evidence points to the impact of the advisory services on the knowledge and perception levels of the farmers. The study gave valuable insights into the potential outcome of the ICT enabled extension services. The programme made a considerable impact on farmers in performing farming activities effectively. A high level of satisfaction was expressed, across project villages in the KfW project villages of all the states, on the relevance of the messages, timeliness of the messages, understand ability of messages, the treatment provided to the messages etc. This is found to have translated into enhancing the knowledge levels, initiating changes in the agricultural practices and thus, resulting in enhanced agricultural incomes through improved productivity and accessibility. It can be concluded that the Agricultural extension system could be made more effective by pairing ICT enabled digital advisory services with the conventional extension system to reach a myriad number of farmers.

## Key findings

1. The theory of change predicts that NICE agro advisory services will solve underlying needs by providing farmers with information that will close those knowledge gaps. The information provided in both interventions covered a wide range of topics right from production to marketing. It is found that the programme has been successful in addressing the needs and requirements of the farming families in the selected villages or the watersheds. The result has been at various levels viz., Provision of Knowledge and information on Crop Management Practices and Provision of Market Information. The effect of this change is reflected through the perceptions of the farmers on the economic impact of the programme.

2. The analysis of the results shows that 93 per cent of the farmers expressed that the messages were provided on time. A maximum number of the farmers have strongly agreed on the relevance of the services provided through NAAS. The guidance provided is highly relevant, appropriate and timely. This also speaks of the lack of other services for these farmers to aid and guide their agricultural operations.

3. The services provided in the realm of insect and pest management have been rated very highly by the farmers. This could be due to the high cost incurred by them in this aspect?. Perhaps, this might have enabled them to take rational decisions rather than relying on 'common sense' or guided

by ‘traditional wisdom’. The farmers were very clear that NICE advisory services have increased their knowledge on carrying out operations like sowing, harvesting, marketing etc.

4. A majority of the farmers strongly agreed that NICE services motivated the farmers to adopt agricultural technologies. The reason might be that the advisories they received are more relevant to them and are also easily understood by the farmers, they are appealing and finally enabling them to adopt it. The programme design ought to have helped the farmers in this regard.

5. The farmers were also highly satisfied with the information provided by the NICE services relating to the market price for agricultural produce. This could be helping them in wisely marketing their produce thereby helping them obtain a better price.

6. The study reveals that NICE advisory services increased their knowledge on carrying out operations like sowing, harvesting and marketing. Timely pest and disease forecasting has led to proper crop protection measures and better management of the crop, reducing crop losses, This, in turn, led to the increase in the income of the farmers indirectly.

7. It is evident from the study that the NICE services have impacted the farmers economically, by reducing the number of sprays and optimal use of inputs such as fertilizers, pesticides etc thereby directly reducing the cost of cultivation. These services also helped in proper management of inputs and irrigation eventually making them profitable by decreasing the cultivation costs.

8. The present study points out that the psychological and economic impacts are to a very great extent mutually inclusive, yet psychological aspects also influence other aspects. Hence, it becomes important that the programme aims at enhancing the psychological impacts before it can expect increased economic impacts which perhaps are found to be very much ‘auto’.

## Recommendations

1. The project provided the channel to create and streamline the content generation process i.e. advisory to farmers on local crops by the local scientists of KVKs and State Agricultural Universities for more effective agricultural advisory dissemination to the farmers at the village level. This process of channelizing is to be continued with the established network of scientists of KVKs and State Agricultural Universities.
2. NICE System has been created to meet the needs of the scientists to develop and streamline the content generation process using multi-level dissemination channels like SMS, Posters,

Video URLs, Document services etc. These kinds of multi-level channels are required to provide advisory services to farmers.

3. The NICE System and Scientists of KVKs and SAUs work together to provide better advisory services to farmers. The data base of registered farmers should be updated from time to time with Mobile numbers, crops for the season etc to plan the content generation to provide farmer specific information required on crops and other farm related activities.
4. The study has revealed the importance of psychological and economic impacts under the programme. Hence, it becomes important that the programme aims at enhancing the psychological impacts before it can expect increased economic impacts which perhaps is found to be very much 'auto'. This brings in the role of various interventions and perhaps the role of the CRP as well.
5. The present programme could be extended to larger areas considering the impacts that it has created in the agricultural sector which will help both at the micro and macro development level .
6. The study also shows that project farmers had distinctly benefitted from the project interventions using NICE advisory services as compared to the traditional extension mechanism. Climate adaptation is a continuous process; it is strongly recommended that the project efforts are sustained and scaled up across the country with the existing departmental structure, particularly ATMA which has been involved in providing extension support to the farmers at district, block and below block level for realizing long term benefits. The positive results from the study can provide strategic direction for implementation of similar central sector ICT enabled projects for providing digital agro-advisory services to the farmers in the entire country.

# ANNEXURE-I

## INTERVIEW SCHEDULE ON IMPACT OF NICE AGRO ADVISORY SERVICES (NAAS) ON FARMERS

General information

* Required

1. Name of the farmer *

2. Name of the village *

3. Name of the district *

4. Name of the watershed *

5. Name of the state(Select your state) *

*Mark only one oval.*

- ( ) Andhra pradesh
- ( ) Telangana
- ( ) Chhattisgarh
- ( ) Odisha
- ( ) Karnataka

6. Mobile no *

*Skip to question 7*

Personal and Socio-Economic Characteristics of Farmers

7. Age (in completed years) *

_____

8. Education *

*Mark only one oval.*

- ◯ primary
- ◯ High school
- ◯ Intermediate
- ◯ Graduation and above

9. Family size *

_____

10. Size of landholding (in acres) *

_____

11. Soil type *

*Mark only one oval.*

- ◯ Black soil
- ◯ red soil
- ◯ loamy soil
- ◯ sandy loam soil
- ◯ Alluvial soil
- ◯ Sodic soil
- ◯ Both black and red soil

12. Farming experience(in completed years) *

13. How long you are using mobile (in completed years) *

14. Do you have a smartphone: *

*Mark only one oval.*

- ◯ Yes
- ◯ No

15. Annual family income from Agriculture (Rs.) *

16. Annual family income from other sources( Rs.)

17. Please indicate the crops grown in the last Kharif season *

18. Please indicate the crops grown in the last Rabi season *

19. Please indicate the crops grown in the last summer season

20. Please indicate the horticultural crops grown during last year

21. please mention your livestock possession

*Mark only one oval per row.*

| | yes | No |
|---|---|---|
| cattle | ◯ | ◯ |
| goat/sheep | ◯ | ◯ |
| poultry | ◯ | ◯ |

22. Extension contact: Do you contact extension agents? Select Yes / No, If yes, please indicate below that how frequently you contact extension agents *

*Mark only one oval.*

◯ Yes
◯ No

23. If yes, please indicate below how frequently you contact extension agents *

*Mark only one oval per row.*

| | Regularly | Occasionally | Never |
|---|---|---|---|
| NABARD KFW Consultant | ◯ | ◯ | ◯ |
| State Agriculture Department/SAU | ◯ | ◯ | ◯ |
| Progressive farmers(farmer to farmer) | ◯ | ◯ | ◯ |

24. 1. Extent of climate variations *

*Mark only one oval per row.*

| | Strongly agree | Agree | Undecided | Disagree | Strongly disagree |
|---|---|---|---|---|---|
| Decrease in average rainfall | ◯ | ◯ | ◯ | ◯ | ◯ |
| Late onset of monsoon | ◯ | ◯ | ◯ | ◯ | ◯ |
| Occurrence of drought | ◯ | ◯ | ◯ | ◯ | ◯ |
| Uneven distribution of rainfall | ◯ | ◯ | ◯ | ◯ | ◯ |
| Increased pest and diseases | ◯ | ◯ | ◯ | ◯ | ◯ |
| Decrease in quality of products | ◯ | ◯ | ◯ | ◯ | ◯ |
| Decreased yield | ◯ | ◯ | ◯ | ◯ | ◯ |
| Increased crop weed competition | ◯ | ◯ | ◯ | ◯ | ◯ |
| Changes in time of sowing | ◯ | ◯ | ◯ | ◯ | ◯ |
| Reduced soil fertility | ◯ | ◯ | ◯ | ◯ | ◯ |

*Skip to question 25*

Impact of NICE enabled Advisory Services on farmers

Awareness

25. Awareness *

*Mark only one oval per row.*

| | Strongly agree | Agree | Undecided | Disagree | Strongly Disagree |
|---|---|---|---|---|---|
| Information provided under NICE is clearly understandable | ◯ | ◯ | ◯ | ◯ | ◯ |
| NICE provides time based information | ◯ | ◯ | ◯ | ◯ | ◯ |
| NICE provides need based information | ◯ | ◯ | ◯ | ◯ | ◯ |
| NICE services save time and money | ◯ | ◯ | ◯ | ◯ | ◯ |
| NICE services promotes increase in knowledge | ◯ | ◯ | ◯ | ◯ | ◯ |
| NICE services promotes increase in productivity | ◯ | ◯ | ◯ | ◯ | ◯ |
| Information provided by NICE service is adaptable in field conditions | ◯ | ◯ | ◯ | ◯ | ◯ |
| The advisory services in the form of posters are understandable, useful and effective | ◯ | ◯ | ◯ | ◯ | ◯ |
| The advisory services in the form of Video links are understandable, useful and effective | ◯ | ◯ | ◯ | ◯ | ◯ |
| The advisory services in the form of SMS are understandable, useful and effective | ◯ | ◯ | ◯ | ◯ | ◯ |

Perception of the respondents towards NICE Agro-advisory Services (NAAS)

26. Timeliness of the messages *

*Mark only one oval per row.*

| | yes | no |
|---|---|---|
| Coinciding with the crop growth | ◯ | ◯ |
| Early | ◯ | ◯ |
| Late | ◯ | ◯ |

27. The relevance of the advisories *

*Mark only one oval.*

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Irrelevant | ◯ | ◯ | ◯ | ◯ | ◯ | Highly relevant |

28. Understanding of message *

*Mark only one oval.*

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Difficult to understand | ◯ | ◯ | ◯ | ◯ | ◯ | Very easy to understand |

29. Message treatment *

*Mark only one oval.*

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Less technical | ◯ | ◯ | ◯ | ◯ | ◯ | Highly technical |

30. Content adequacy *

*Mark only one oval.*

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Not at all adequate | ◯ | ◯ | ◯ | ◯ | ◯ | Adequate |

## Impact of NICE Agro Advisory Services (NAAS) on farmers

31. Impact of Agricultural Information *

*Mark only one oval per row.*

| | Strongly agree | Agree | Undecided | Disagree | Strongly disagree |
|---|---|---|---|---|---|
| Better seasonal crop management is possible due to the NICE Agro Advisory Services (NAAS) | ◯ | ◯ | ◯ | ◯ | ◯ |
| Critical inputs can be optimally used by the farmer due to the guidance received through NAAS | ◯ | ◯ | ◯ | ◯ | ◯ |
| NAAS helps farmer in proper insect pest and disease management | ◯ | ◯ | ◯ | ◯ | ◯ |
| Farm operations like sowing, harvesting, marketing etc. can be performed well on time with the help of technical guidance | ◯ | ◯ | ◯ | ◯ | ◯ |
| Farmer can shift the cropping pattern with the help of weather advisory services | ◯ | ◯ | ◯ | ◯ | ◯ |
| Timely pest and disease forecasting leads to proper crop protection measures | ◯ | ◯ | ◯ | ◯ | ◯ |
| Weather advisory helps in proper management of transportation of farm produce for distant market | ◯ | ◯ | ◯ | ◯ | ◯ |
| Sometimes technical information is too technical to understand by the farmers | ◯ | ◯ | ◯ | ◯ | ◯ |

32. Impact of Market information *

*Mark only one oval per row.*

| | Strongly agree | Agree | Undecided | Disagree | Strongly disagree |
|---|---|---|---|---|---|
| NAAS provides all the market prices of the different farm produce to the farmers | ◯ | ◯ | ◯ | ◯ | ◯ |
| The farmer can select better market for their produce due to NAAS | ◯ | ◯ | ◯ | ◯ | ◯ |
| NAAS provides better opportunity for purchasing quality inputs at fair prices | ◯ | ◯ | ◯ | ◯ | ◯ |
| Farmers become aware about the malpractices at the market yard due to NAAS | ◯ | ◯ | ◯ | ◯ | ◯ |
| Agricultural Input prices and their availability etc information is also provided through NAAS | ◯ | ◯ | ◯ | ◯ | ◯ |

33. Psychological Impact *

*Mark only one oval per row.*

| | Strongly agree | Agree | Undecided | Disagree | Strongly disagree |
|---|---|---|---|---|---|
| NAAS facilitates decision making of farmers about various agricultural operations | ◯ | ◯ | ◯ | ◯ | ◯ |
| Farmers get motivated to visit the Krishi vignana Kendra/research centers willingly for seeking detailed information on new technologies | ◯ | ◯ | ◯ | ◯ | ◯ |
| NAAS motivates the farmers to adopt agricultural technologies | ◯ | ◯ | ◯ | ◯ | ◯ |

34. Economic Impact *

*Mark only one oval per row.*

| | Strongly agree | Agree | Undecided | Disagree | Strongly disagree |
|---|---|---|---|---|---|
| NAAS help farmers in effective planning of plant protection measures | | | | | |
| NAAS reduces frequency of sprays in crops | | | | | |
| Proper technical guidance through NAAS lessen economic burden of farmers | | | | | |
| Proper input management reduces economic losses of the farmers | | | | | |
| Proper irrigation management reduces economic issues of farmers | | | | | |
| NAAS can help in better economic returns which results in uplifting the standard of living of the farmers | | | | | |
| Farmers can get benefit from the Crop Insurance schemes and Subsidy for Government schemes | | | | | |

35. Livelihood Impact *

*Mark only one oval per row.*

| | Strongly agree | Agree | Undecided | Disagree | Strongly disagree |
|---|---|---|---|---|---|
| Enhanced skills related to farming | | | | | |
| Enhanced income | | | | | |

*Skip to question 36*

Economic impact (Indicate if you are economically benefitted by the information services on the following items in terms of Yes and No)

36. Indicate if you are economically benefitted in the following areas *

*Check all that apply.*

| | Before NAAS ( If yes please select this) | After NAAS (If Yes please select this) |
|---|---|---|
| Land preparation | ☐ | ☐ |
| Selection of crops | ☐ | ☐ |
| Selection of varieties | ☐ | ☐ |
| Sowing time | ☐ | ☐ |
| Soil testing & soil test based fertilizer application | ☐ | ☐ |
| Weed management | ☐ | ☐ |
| Irrigation scheduling | ☐ | ☐ |
| Intercultural operations | ☐ | ☐ |
| Pest management | ☐ | ☐ |
| Disease management | ☐ | ☐ |
| Farm mechanization | ☐ | ☐ |
| Labour management | ☐ | ☐ |
| Harvesting | ☐ | ☐ |
| Drying and storage | ☐ | ☐ |
| Weather related information | ☐ | ☐ |
| Marketing | ☐ | ☐ |
| Governmental schemes | ☐ | ☐ |
| Credit and finance | ☐ | ☐ |
| Insurance | ☐ | ☐ |

Constraints and suggestions(NAAS)

37. Constraints encountered by respondents during the use of NICE agro advisory(NAAS) *

*Mark only one oval per row.*

| | YES | No |
|---|---|---|
| complex information delivered through SMS | ◯ | ◯ |
| Irregularity in delivering weather advisory services | ◯ | ◯ |
| Lack of knowledge about new technologies | ◯ | ◯ |
| Lack of knowledge about market information through NAAS | ◯ | ◯ |
| Unaware about government schemes | ◯ | ◯ |
| Unaware about benefits of SMS advisory services | ◯ | ◯ |

38. suggestions provided by the respondents to overcome the constraints

*Mark only one oval per row.*

| | yes | no |
|---|---|---|
| improve network and connectivity in villages | ◯ | ◯ |
| provide accurate and timely market information | ◯ | ◯ |
| organize awareness programs about NAAS | ◯ | ◯ |

39. Any constraints faced in receiving the agro advisories of NICE System

_____

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