Report on

Evaluation and Impact Assessment Study of State Sector Scheme NeGP-A

National Institute of Agricultural Extension Management (MANAGE), Rajendra Nagar, Hyderabad

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Evaluation and Impact Assessment Study of State Sector Scheme NeGP-A

(2010-11 to 2016-17)

for

Department of Agriculture, Cooperation and Farmers Welfare
Ministry of Agriculture and Farmers Welfare
Government of India

by

National Institute of agricultural Extension Management (MANAGE), Rajendranagar, Hyderabad

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Executive Summary

Government of India is implementing a State Sector Plan (centrally sponsored scheme) – National e-Governance Plan-Agriculture (NeGP-A) across all the states of the country. NeGP-A is a component of the National Mission on Agriculture and Technology. The aim of the mission is to restructure and strengthen agricultural extension to enable delivery of appropriate technology and improved agronomic practices to the farmers. This is envisaged to be achieved by a judicious mix of extensive physical outreach and interactive methods of Information dissemination including use of Information and Communication Technology (ICT). NeGP-A was implemented since 2010-11 as a pilot project in selected 7 states namely, Assam, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh and Maharashtra. In Phase-II roll-out, the remaining 22 states have been covered.

The main objective of NeGP-A is to create a conducive environment for raising farm productivity and income of farmers through provision of relevant information and services to Stakeholders. This project comprises of Agriculture, Horticulture, Animal Husbandry and Fisheries. The State Agriculture department is the Nodal Department for spearheading the NeGP-A in Agriculture and Allied sectors.

As the NeGP-A roll-out has completed 5 years, the Department of Agriculture & Farmers Welfare (DAC&FW) asked National Institute of Agricultural Extension Management (MANAGE), Hyderabad to undertake the Evaluation and Impact Study of National e-Governance Plan-Agriculture (NeGP-A). The study covers five states viz., states of Tamil Nadu, Madhya Pradesh, Odisha, Sikkim and Gujarat.

Tamil Nadu: Almost all the farmers are registered on ICT portals and hardware distribution has reached up to block level. Training centers are fully operationalized for capacity building. The content on the farmer portal needs to be enhanced, updated and in the local language. The Mobile app Kisan Suvidha has been used by more number of farmers in Tamil Nadu.

Madhya Pradesh: Only 39.35 per cent of farmers are registered on ICT portals and 9.84 per cent of the farmers in the state registered on mKisan. Hardware distribution has reached up to Block level but there were no training centres established in Madhya Pradesh. 41.00 percent of farmers were educated up to high school level in Madhya Pradesh. Average Number of mobiles in a family was 2.43 and average number of Registered Mobiles

was 0.88. Majority of farmers registered through Kissan Call Centre (KCC) for receiving SMS advisories. Farmers received on an average 13 messages in a month and the main source of received messages was extension officers. Maximum topics covered in SMS were on agriculture.

Odisha: Around half of the farmers are registered in mKisan. Distribution of Hardware *i.e.* Computer and UPS is up to block level but distribution of printers is only limited to state level. Six training centres have been established but no trainings have been conducted in any of the centres. Majority of farmers in the state are educated up to primary and middle school level. Average number of mobiles in a family was 1.36 and Average number of Registered Mobiles was 1.00. The gap between availability of mobile and registered mobile for NeGP-A services was minimum in Odisha state. Cent Per cent of Farmers registered through Kissan Call Centre (KCC). Average number of received messages was 7.53 and almost all messages related to agriculture.

Sikkim: In Sikkim State, none of the farmers registered on ICT portals and only 5 per cent of the Farmers registered for mKisan service. Distribution of desktops, printers and UPS has not reached upto block level in Sikkim state. One training centre has been established and training conducted. Majority of farmers in the state are educated up to primary and middle school level. Average Number of mobiles in a family was 2.44 and Average of Registered Mobiles was 1.00. Cent Per cent of Farmers registered through Short Message Service (SMS). Average number of received messages was 3.64 and majority of messages related to Horticulture and all were found useful for farmers.

Gujarat: In Gujarat, 36 per cent of farmers are registered on ICT portals with only 12 per cent of the farmers registered for mKisan service. Distribution of desktops, printers and UPS has reached upto the block level. No training centres have been proposed nor established and no trainings conducted. In the state, 31.00 per cent of farmers are educated upto primary school level. The average number of mobiles in a family are 3 with average number of registered mobiles being one. Majority of the farmers (75%) registered for SMS advisories through Kisan Call Centre (KCC). Average number of SMS received per month was 32 and 95% of the messages were received from extension officers. 98% of advisories pertained to agriculture.

Introduction

Information and Communication Technology (ICT) in agriculture is impacting directly on the agricultural and rural population in India, improving access to information, services, communication and bridging the knowledge gap. ICTs provide a unique opportunity in the Agriculture sector to bridge the gap between the Lab (national and international), Market and Farmers. The developments in ICT can be applied for providing timely, relevant, accurate information and services to all the stakeholders of agriculture, thus facilitating an environment for more remunerative agriculture. The Agriculture sector is gearing itself to make optimal use of these information and communication technologies. At the Government of India level, a number of important initiatives have been taken up to enhance the usage of ICT in organizations and institutions involved in agricultural education, research, development and dissemination. Government of India is implementing National e-Governance Plan-Agriculture (NeGP-A) for development and application of customized technologies specific to agro-climatic conditions, farm size and level of agricultural development.

2.1. National e-Governance Plan-Agriculture (NeGP-A) Scheme

NeGP-A is a component of the National Mission on Agriculture and Technology (NMAET). The aim of the Mission is to re-structure and strengthen agricultural extension to enable delivery of appropriate technology and improved agronomic practices to the farmers. This is envisaged to be achieved by a judicious mix of extensive physical outreach & interactive methods of information dissemination including use of ICT. The vision of the scheme "National e-Governance Plan Agriculture" popularly known as NeGP-A is to create a conducive environment for raising farm productivity and income to global levels through provision of relevant information and services to the farmers and other stakeholders. National e-Governance Plan - Agriculture (NeGP-A) aims to provide an integrated and seamless interface to the farmers for making informed decisions. Under NeGP-A various modes of delivery of services have been envisaged. These include internet, touch screen kiosks, electronic media, mobile phones (broadcast, Interactive Voice Response System, interactive messaging using Unstructured Supplementary Service Data and Voice Recognition), KVKs, agri-clinics, private kiosks, mass media, Common Service Centres, Kisan Call Centres, and integrated platforms in the departmental offices coupled with

physical outreach of extension personnel equipped with pico-projectors and hand held devices to enable easy access to information for the farmer. It would also help in effective monitoring of the targeted beneficiaries.

NeGP-A was implemented since 2010-11 as a pilot project in 7 selected states namely, Assam, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh and Maharashtra. In Phase-II roll-out, the remaining 22 states have been covered. NeGP-A has been implemented on a pan-India basis. This Scheme was started with the following key objectives:

- Bringing farmer centricity and service orientation to the programmes
- Enhancing reach and impact of extension services
- Improving access of farmer to information and services through-out the crop cycle.
- Building upon, enhancing and integrating the existing ICT initiatives of Centre and States
- Enhancing efficiency and effectiveness of programmes through process redesign
- Increased efficiency in management of DAC&FW schemes
- Promoting a common framework across all states and UTs.

The following activities are included in Phase 1 of the scheme. Phase I of the scheme was implemented in 7 states namely Assam, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh and Maharashtra. The services were rolled out to other states / UTs in Phase - II.

- Site preparation of offices, where hardware is to be installed and establishment of computer training labs
- Procurement, installation and accounting of Hardware/system software. Back-up power arrangements, wherever required
- Setting-up of State Project Management Unit (SPMUs), Hiring of manpower on contract basis (Data Entry Operators) (DEOs)
- Connectivity for the locations where hardware is being installed and Data Digitization
- Customization of applications as per State/ UT's specific requirements.

During Phase I of the scheme, the hardware were centrally procured and distributed to all the 7 pilot states. Hardware was also provided to Data Centres and the Mandis. An amount of Rs. 3024.526 lakhs has been released to these states till now.

However, during Phase II of the project, the states were requested to procure the hardware themselves and the funds were released by ROI for the purpose. States were also required to pool in the state matching share (40% in case of plain states, and 10% in case of North Eastern States and Himalayan states -J&K and H.P.)

Under NeGP-A, 12 core service clusters have been identified to develop and implement potential ICT applications in Agriculture and allied sectors to deliver the information services to the farming community and other stakeholders. These 12 service clusters have been subdivided into 22 components, which are fully operationalized and in use in all states. These prioritised services are envisaged to assist the farmers throughout the crop cycle in reducing costs of production and ensure remunerative prices using latest knowledge and techniques so as to increase their profits.

Cluster of Services:

1.	Information of pesticides, fertilizers and seeds	7	Information on marketing infrastructure
2	Providing Information on soil health	8	Monitoring implementation/ evaluation of schemes & programmes
3	Information on crops, farm machinery, training and Good Agricultural Practices (GAPs)	9	Information of Fishery inputs
4	Information on weather forecast	10	Information of irrigation infrastructure
5	Information of prices, arrivals, procurement points and providing interaction platform.	11	Drought relief and management
6	Electronic certification for exports and imports.	12	Livestock management

System Requirement Specifications of most of the clusters of services have been completed by the software development Agency i.e. National Informatics Centre. These 12 service clusters are further subdivided into 49 components.

DAC&FW has developed a number of portals, applications and websites (primarily in collaboration with NIC covering both the headquarters and its field offices/ Directorates. DAC&FW is getting online data entry done right from the District level at least, so as to expedite generation of requisite queries and reports in an efficient manner.

As the NeGP-A roll-out has completed 5 years, DAC&FW asked National Institute of Agricultural Extension Management (MANAGE), Hyderabad to undertake the Evaluation and Impact Study of National e-Governance Plan-Agriculture (NeGP-A).

Objectives of the Study

NeGP-A is spread across all 29 states and 7 UTs *i.e.* over 650 districts in the country and reached upto block level with information services for farmers. A government scheme of this large scale naturally provides important lessons, insight, experiences as well as functional difficulties in implementing the scheme. The lessons from this scheme would be helpful and will improve the efficiency of this scheme in future. In order to find out about the implementation of the scheme all in the States, it would be necessary to understand the role of various institutes and concerned departments including their best practices, feedback of the farmers, nodal officers and other stakeholders in NeGP-A. This particular study is aimed to evaluate information on quantitative and qualitative performance of approved activities under the scheme and also the functioning of various institutions concerned and to assess its viability for continuation beyond the 12th Plan.

3.1. Scope of the Work

The framework and scope of the study are as follows:

a) Highlighting the baseline/community situation (if available with implementing agency prior to launch of the scheme).
b) Outlining each portal / intervention, physical coverage, financial spending till March 31, 2017, stakeholder mapping and various activities undertaken by them.
c) Assessing the awareness and reach among the farmers about various ICT interventions.
d) Recording impact of interventions as evidenced through changes on specific parameters.
e) Recording achievement of objectives of the scheme through various indicators.
f) Case studies of a few farmers who have benefited from the scheme across different regions of the country.
g) Assessing of involvement and role of state agencies and recording their perspective about the portals/ intervention.
h) Suggesting modifications/ changes in developed portals based on interview with various stakeholders for improved dissemination and usage.

i) Assessing viability of rolled out portals/ activities therein for extension beyond 12th Plan and providing support in preparation of proposal for EFC, if required.

j) Assess the use of hardware provided under the scheme to provide services to farmers.

3.2. Geographical Coverage

i. The evaluation study covered five states - region-wise - Orissa, Madhya Pradesh, Gujarat, Tamil Nadu and Sikkim. Two districts were selected randomly from each state and from each district four villages from different blocks were randomly selected for the survey.

ii. Components developed and rolled out from 12 service clusters were studied in such a way that in each sample state 2 service clusters and its active component were considered for study. The usage of mobile apps and other portals developed by centre/ state was also studied.

iii. Personal interview was conducted with officials at state and district level along with interview of selected farmers, traders and other service providers (about 25 samples in each state excluding farmers).

3.3. Deliverables

The deliverables of the evaluation study include:

a. Executive summary for the entire state.

b. The findings of the study on aforesaid parameters analysed and put up both - district wise as well in totality for the states along with final outcome both district wise and total.

c. First draft report to be submitted within 75 days from the date of approval of work.

d. Final report to be submitted within 15 days of receiving comments on the first draft.

Methodology

4.1 Research Methodology

The NeGP-A is under implementation in all the 29 states of the country, out of which 7 states were covered in the Phase-I roll out (from 2010-11 onwards) and the remaining 22 states were covered in Phase-II, rolled out in 2012-13. It was envisaged in the NeGP-A design, to establish one State Project Management Unit (SPMU) at each State Headquarters to coordinate the planning, implementation and reporting on NeGP-A. All the states have established NeGP-A SPMUs, and have rolled out the other components of the project including procurement and deployment of hardware and software (laptops, desktops, printers, UPSs, Information Kiosks and tablets) at State Headquarters, Division Units, District Units, Block Units (except Sikkim where it is yet to reach block level) and at designated training centers (developed under NeGP-A to impart hands on training on ICT applications and tools to Agriculture and allied department functionaries and farmers. Some of the states already had training centers at district or division level. These training centers were upgraded to impart ICT related training, by enhancing its infrastructure with 20 desktops and required UPS and printer support. All the districts, Deputy Director of Agriculture offices, blocks were proposed to be connected under NeGP-A. All officers were to be trained on ICT Applications (including mobile apps, launched by Ministry of Agriculture & Farmers Welfare, Government of India). The impact study was to take stock of all this development in all the identified states, in respect of NeGP-A roll out – procurement and installation of hardware and software, establishment of SPMUs, training centers and the use of ICT enabled services by the farming community.

Three questionnaires were developed to be administered to (a) - Nodal Officers (IT), to take feedback on establishment of SPMUs, their operation – rolling out NeGP-A at state , district and block level and status of receipt and utilization of funds at state level (b) – Officers at State and District level, to take feedback on their perception of the NeGP-A services and its efficacy at grass root level, and (c) – Farmers, to gauge the impact of NeGP-A at grass root level, including training imparted to farmers on access of agricultural

advisories and information through ICT enabled methods like SMSs, KCC and web services. The copy of the three questionnaires administered is placed at Annex-I, II and III.

A team of five faculty members of MANAGE was constituted to visit all the five states (Headquarters) to administer the Nodal Officer (IT) questionnaire and have discussions with State level senior officers on their perception of NeGP-A and its usage in short run and long run. A meeting with identified district level officers was also convened at each of the state/district headquarters to take feedback from them in a structured (questionnaire) and in general as well. Interaction with a group of farmers was also arranged in selected districts (in Tamil Nadu and Odisha) and with local farmers in Madhya Pradesh, Gujarat and Sikkim. The data collection from the farmers was entrusted to an identified professional data collection agency.

4.2. Sampling Methodology

The Impact of NeGP-A was to be studied in all the 29 states of the country. To give a fair representation to all the Agro-climatic regions and also in view of the vastness of the country a two-stage stratified Random Sampling Methodology was adopted. The first Stage being the State and Second Stage was District. Five states were purposefully selected at the first stage to represent all the regions of the country. These states and details of two Districts from each State are given below:

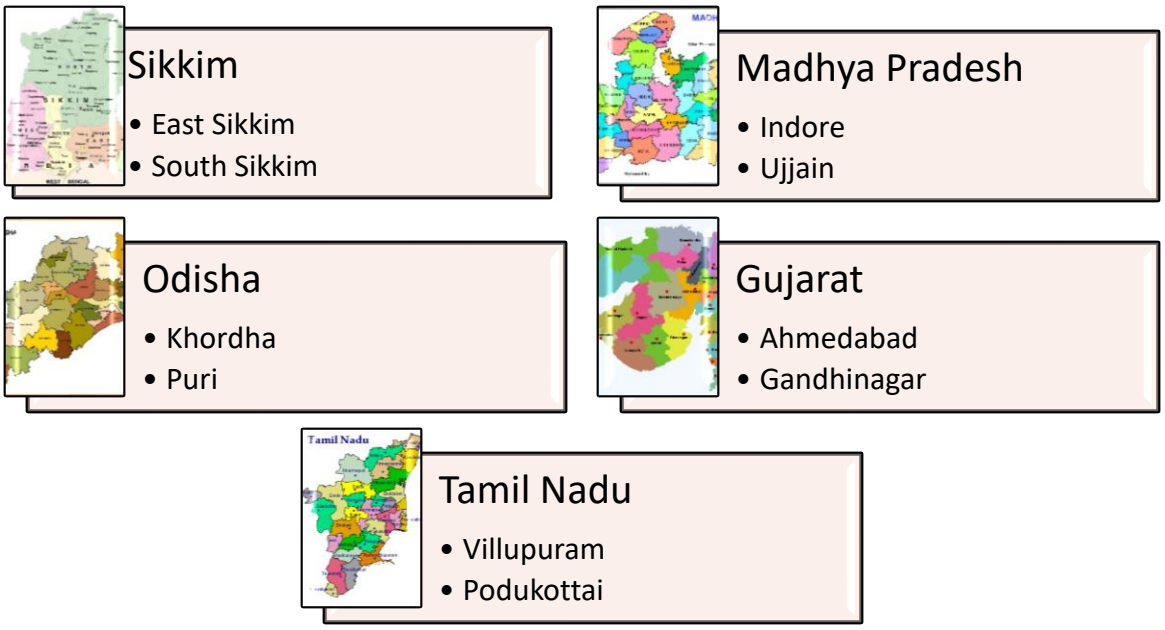


Fig 1: Representation of selected States and Districts

Data was collected from the five Nodal Officers of the above States through a structured questionnaire besides face-to-face meeting to elicit their view on the implementation and progress of NeGP-A Scheme activities in their States. In order to collect data from Officers on the NeGP-A Scheme, a one-day workshop has been organized at the State Headquarters.

Fig 2: Representation of Selected states in India

One hundred farmers were selected from each of the 10 districts (two districts each from five states) for in-depth data collection, in a pre-tested questionnaire. The data collection work was undertaken by an independent agency using a mobile app on a tablet (so as to ensure maximum accuracy in data collection and feeding). A total of 1000 farmers have responded to the questionnaires.

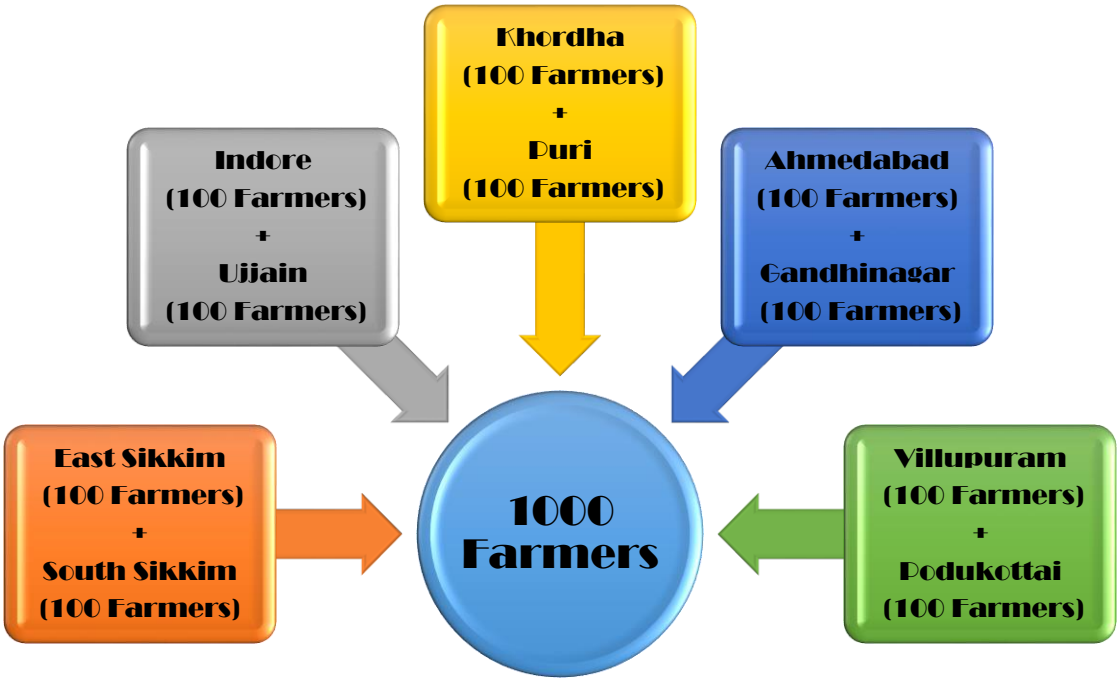


Fig 3: Selection of Farmers

Results and Discussions

Farmer Registration

After development of NeGP-A scheme, registration of farmers has been increasing with introduction and establishment of Soil Health Card, Farmers Portal, mKisan etc. Membership of farmers on all these portals is progressing. Details of farmer registration in different portals in the studied states is given in Table 1.

Table. 1. Details of Farmer Registration on ICT portals

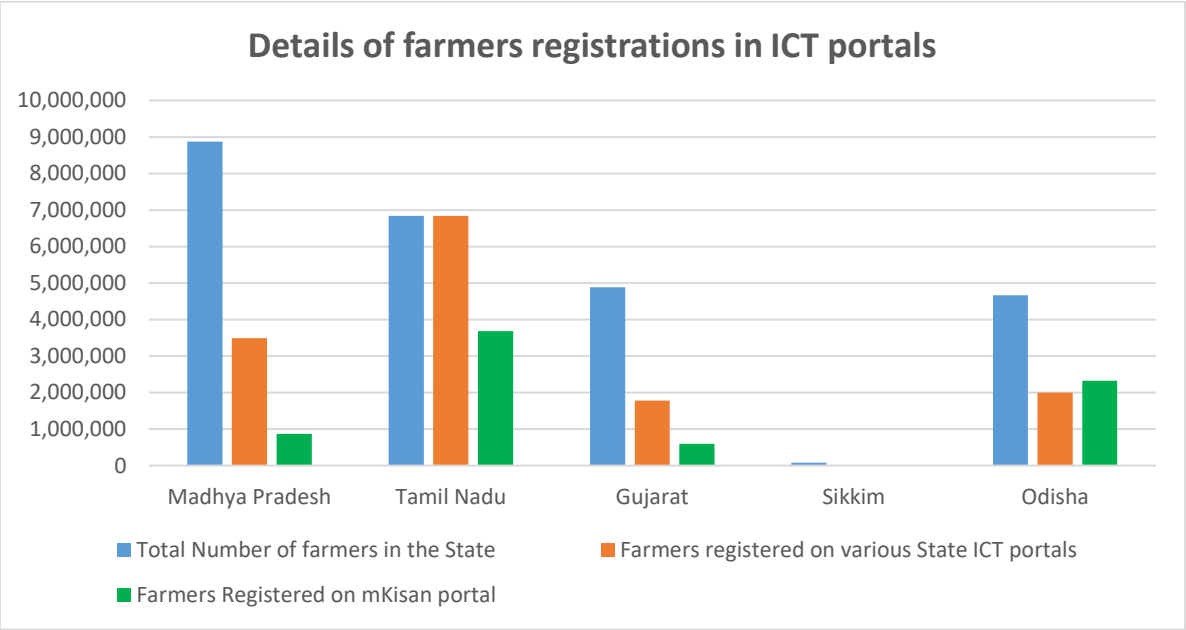
S. No.	State	Total Number of farmers	Farmers registered on various State ICT portals	Farmers Registered on mKisan portal (%)
1	Sikkim	80,000	00	4000 (5%)
2	Madhya Pradesh	88,72,000	34,90,774	8,73,363 (09.84%)
3	Odisha	46,67,466	19,97,000	23,24,896 (49.8%)
4	Gujarat	48,85,000	17,80,000	6,00,000 (12.28%)
5	Tamil Nadu	68,39,628	68,39,628	36,86,079 (53.89%)

Table 1 shows that all farmers of Tamil Nadu were registered on various ICT portals and almost half of the farmers registered on mKisan portal in Tamil Nadu and Odisha whereas only 12.28, 9.84 and 5 per cent of farmers were registered on mKisan portal in Gujarat, MP and Sikkim respectively.

Table 2: Details of farmers registrations in ICT portals

S. No.	Farmers Registration	Madhya Pradesh	Tamil Nadu	Gujarat	Sikkim	Odisha
1	Total Number of farmers in the State	88,72,000	68,39,628	48,85,000	80000	46,67,466

2	Farmers registered on various State ICT portals	34,90,774	68,39,628	17,80,000	--	19,97,000
3	Farmers Registered on mKisan portal	8,73,363 (09.84%)	36,86,079 (53.89%)	6,00,000 (12.38 %)	4000 (5.00%)	23,24,896 (49.81 %)



The above table shows that maximum percent (53.89%) farmers registered in mKisan portal in Tamil Nadu followed by Odisha (49.81 %), Gujarat (12.38 %), Madhya Pradesh (09.84%) and Sikkim (5.00%).

Fund Flows for NeGP-A Scheme

Government of India is giving fully support to NeGp-A through release of fund in all the states. Fund release pattern may vary from state to state and in certain states, the state government also added funds in NeGP-A activities. The fund release pattern and utilization is as follows.

Table 3. Year-wise details of expenditure as made available by State Nodal Officers

S. No.	State	Total receipt of funds (in lakhs)	Total Expenditure (in lakhs)
1	Sikkim	45.64	39.06
2	Madhya Pradesh	665.445	543.067
3	Odisha	328.998	328.998
4	Gujarat	297.2	0.00
5	Tamil Nadu	1130.09	882.71

It is observed from the Nodal officers of the state that funds are being released but as per the requirement of state, fund release is delayed, hence timely release of funds is recommended for various components of NeGP-A.

Table 4: Budget under NeGP-A

	Madhya Pradesh		Tamil Nadu		Gujarat		Sikkim		Odisha	
Year	**Receipts (Rs. in Lakhs)**	**Expenditure(Rs. in Lakhs)**	**Receipts (in Lakhs) Including state share**	**Expenditure (in Lakhs)**	**Receipts**	**Expenditure**	**Receipts**	**Expenditure**	**Receipts**	**Expenditure**
2010-11	100	0.013	--	--	--	--	--	--	--	--
2011-12	36.5	98.868	--	--	--	--	--	--	--	--
2012-13	142.32	163.489	--	--	--	--	--	--	--	--
2013-14	223.5	123.061	--	--	--	--	--	--	--	--
2014-15	163.125	90.991	350.83 (126.89)	350.83	176.14	0.00	23.70 (0.0)	0.0	192.991	Nil
2015-16	0	35.551	284.50 (113.80)	284.50	121.06	0.00	19.01 (0.0)	0.0	136.002	nil
2016-17	0	31.095	247.38 (98.95) (I^{st} Instalment) 247.38 (II^{nd} Instalment)	247.38 Government order is awaited	198.67 (not released)	0.00	0.0 (2.92)	39.06	nil	328.993
2017-18	--	--	--	--	--	--	0.0 (5.07)	Government order is awaited.	--	--
TOTAL (Rs.)	**665.445**	**543.067**	**1130.09 (339.64)**	**882.71**			**45.64 (2.92)**	**39.06**	**328.993**	**328.993**

Infrastructure Development under NeGP-A Scheme

Infrastructure is a major sector that propels overall development of the usage of ICT in Indian Agriculture. For the effective utilisation of services developed under NeGP-A, new hardware was procured for State Headquarters, District headquarters and block level. The details are shown in the following table:

Table. 5. Hardware procurement and Distribution

S. No.	State	Desktops				Printers				UPSs			
		State	District	Block	Total	State	District	Block	Total	State	District	Block	Total
1	Sikkim	25	16	0	41	5	15	0	20	6	16	0	22
2	Madhya Pradesh	35	571	899	1505	25	269	713	1007	35	372	871	1278
3	Odisha	22	60	78	160	2	-	-	2	40	60	78	178
4	Gujarat	38	245	117	400	25	210	117	352	38	245	117	400
5	Tamil Nadu	39	117	489	645	5	104	352	109	40	117	489	646

The above table shows that hardware procurement and distribution at state, district and block level is in progress in studied states. Distribution of desktops, printers and UPSs has not reached upto block level in Sikkim state. In other states *i.e.* MP, Odisha, Gujarat and Tamil Nadu hardware distribution has reached upto block level. The hardware procured under NeGP-A was effectively utilised for service delivery of NeGP-A services, Farmer portal, mKisan and Input Supply Management Systems without any operational issues at State, District and Block level.

Table 6: Infrastructure Development under NeGP-A

Hardware Procurement	Madhya Pradesh				Tamil Nadu				Gujarat				Sikkim				Odisha			
	S	**D**	**B**	T	**S**	**D**	**B**	**T**	**S**	**D**	**B**	**T**	**S**	**D**	**B**	**T**	**S**	**D**	**B**	**T**
Kiosk	0	50	154	204	--	--	--	00	--	--	--	00	--	--	--	--	--	--	--	00
Desktop	35	571	899	1505	39	117	489	645	38	245	117	400	25	16	0	41	22	60	78	160
UPS	35	372	871	1278	40	117	489	646	38	245	117	400	6	16	0	22	40	60	78	178
Printer	25	269	713	1007	5	104	--	109	25	210	117	352	5	15	0	20	--	--	--	00
Switch	0	83	0	83	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

*S=State, D= District, B= Block, T=total

Training Facilities and Training Programs

Under NeGP-A, training infrastructure in terms of establishing training centers to undertake the capacity building of officers to upgrade their skills in ICT and other needy areas was envisaged. Through these training centres, trainings were conducted for the famers to improve awareness on Farmers portal, mkisan portal and various ICT inventions in Agriculture. Trainings were also conducted for the departmental staff about the new software applications and mobile apps developed by Government of India and State NeGP-A team.

Table 7. State-wise No. of Training centers proposed and established

S.No	State	Training Centers proposed	Training Centers Established	Trainings conducted	No. of Trainees
1	Sikkim	1	1	1	50
2	Madhya Pradesh	6	6	10	300
3	Odisha	6	6	-	-
4	Gujarat	0	0	0	0
5	Tamil Nadu	6	6	25	1250

NeGP-A training centers are fully operationalised for the purpose of capacity building of field functionaries and farmers on ICT interventions in Agriculture and Allied sectors. Training centers have been established in Sikkim, Madhya Pradesh, Odisha and Tamil Nadu and trainings have been conducted by centres in Sikkim, Madhya Pradesh and Tamil Nadu.

Establishment of State Project Management Unit (SPMU):

The State Project Management Unit (SPMU) is the agency deployed at the State Agriculture Department to help in carrying out various activities related to NeGP-A. The SPMUs will be responsible for planning and implementing NeGPA in the State. Activities to be undertaken by SPMU will include: i) before commencement of implementation, activities include identifying State specific customization requirements, firming up Bill of Material (BOM) for hardware requirements at the state/UT level, Consolidating training requirements, networking and connectivity requirements at the State/districts/Blocks level., etc.; ii) Project Management

activities; iii) Co-ordination with various Stakeholders; iv) Monitoring the deployment and commissioning of necessary hardware at the SDC and DR at the state level; v) Monitoring the deployment and commissioning of necessary hardware in the state; vi) Monitoring the deployment and commissioning of necessary networking equipment and connectivity at the State level; vii) User Acceptance Testing (UAT) and Go-line Report; viii) SLA monitoring; ix) Program Management Support ; x) District NeGP-A implementation Team; and xi) Monitoring the Operations & Maintenance.

State Project Management Unit (SPMU), a core team was formed comprising persons who are having an inclination and sufficient knowledge in ICT tools and implementation of e-Governance from the respective departments such as Agriculture, Horticulture, Agricultural Marketing & Agri Business and Agricultural Engineering Department. In Odisha, WIPRO is identified as a SPMU and MAP-IT (Madhya Pradesh Agency for Promotion of IT) to support the PMU at the state level in Madhya Pradesh, similarly The Electronic Corporation of Tamil Nadu (ELCOT), an organization of Government of Tamil Nadu is support SPMU in Tamilnadu. In Gujarat state, SPMU is being setup.

OFFICERS' PERCEPTION

Awareness and reach of ICT interventions under NeGP-A

Table 8: Perception on farmer portal, mKisan portal and Mobile Apps

S.No.	Service Details	Madhya Pradesh	Tamil Nadu	Gujarat	Sikkim	Odisha
1.	Central Agricultural Portal (www.farmer.gov.in)	4.00	3.76	3.41	4.5	0.89
2.	Expert Advisory (mKisan portal for sending alerts and advisories)	3.95	3.76	2.88	4.5	1.78
3.	State Agricultural Portals (AGRISNET or Departmental Portals)	3.68	3.96	2.76	3.63	1.56
4.	Mobile Apps – Kisan Suvidha	1.59	3.64	2.41	0.38	0.33

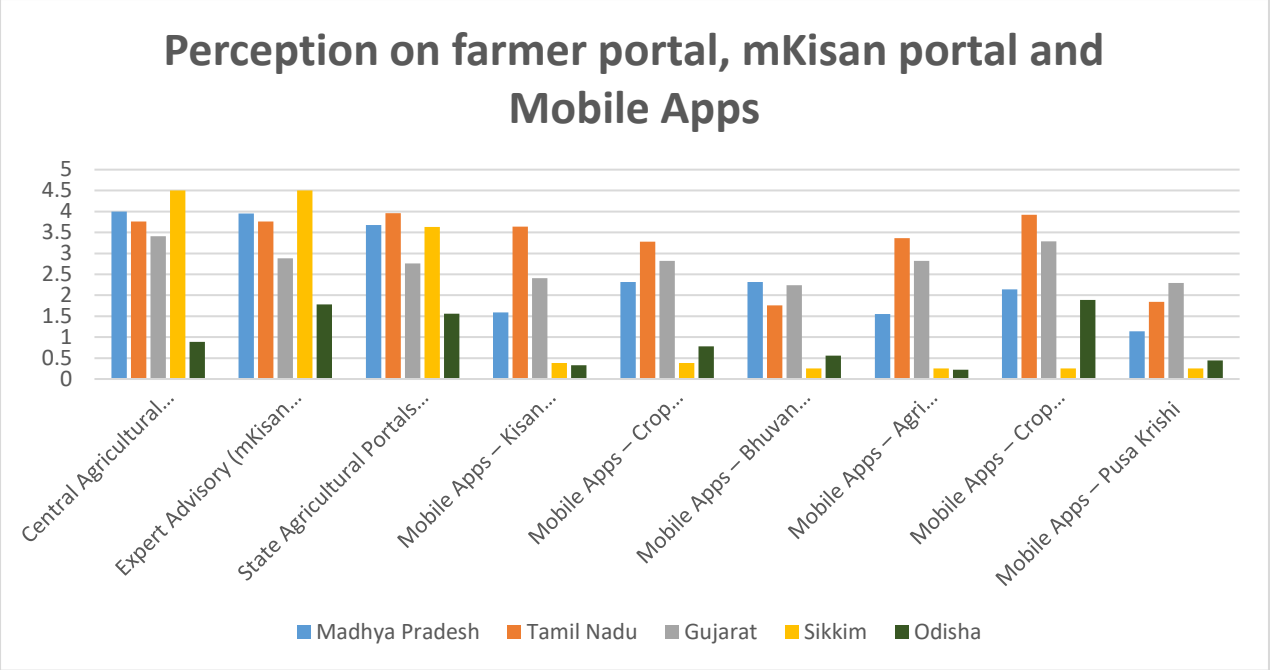
5.	Mobile Apps – Crop Insurance	2.32	3.28	2.82	0.38	0.78
6.	Mobile Apps – Bhuvan Hail Storm app	2.32	1.76	2.24	0.25	0.56
7.	Mobile Apps – Agri Market	1.55	3.36	2.82	0.25	0.22
8.	Mobile Apps – Crop Cutting Experiment (CCE App)	2.14	3.92	3.29	0.25	1.89
9.	Mobile Apps – Pusa Krishi	1.14	1.84	2.29	0.25	0.44

The above table shows that, mean value of Central Agricultural Portal in Madhya Pradesh was 4.00 *i.e.* majority of officers perceived that Central Agricultural Portal is very good in Madhya Pradesh. All other state (Tamil Nadu, Gujarat and Sikkim) also perceived as good to very good while in Odisha , mean value was 0.89 which shows that officer perceived Central Agricultural Portal as do not know to poor.

For service of Expert Advisory (mKisan portal for sending alerts and advisories) maximum mean value was 4.5 (Very good to Excellent) and Odisha had minimum mean value 1.78 (Near to Average to poor).

State Agricultural Portals (AGRISNET or Departmental Portals) service had maximum 3.96 mean value (Very good to good) in Tamil Nadu and minimum (1.59 mean value) in Odisha. Its means Odisha officers perceived State Agricultural Portals (AGRISNET or Departmental Portals) service in between to poor and do not know. The reason of minimum mean value in Odisha may be due to unawareness of existing services of portals.

In the case of mobile app Madhya Pradesh states officers shows that app services was average to poor. In Tamil Nadu maximum app services was very good to good but Pusa Krishi app had minimum mean value (1.76) because Hail storm don't prevail in Tamilnadu. In Gujarat maximum officer perceived mobile app as good to average. In the Sikkim and Odisha officers had lowest mean value which shows that they had very little knowledge about the existing mobile app.



Perception on service components available under NeGP-A

Table 9: Information on Pesticides, Fertilisers and Seeds

S.No.	Service Details	Madhya Pradesh	Tamil Nadu	Gujarat	Sikkim	Odisha
1.	Literature on best practices in Agriculture and Allied Sector (Booklet, Success Stories, Videos etc)	2.95	3.24	3.12	3.83	1.22
2.	Package of practices (including information on right type and dose of pesticides/insecticides and fertilizers and comprehensive agro-climatic zone-wise knowledge-base)	2.55	3.44	2.59	1.63	0.67
3.	Dealer Network (Seed, Fertilizer, Pesticides)	2.68	3.40	2.65	0.38	1.44
4.	Notified Seed Varieties	2.73	3.16	2.82	0.50	0.78

5.	Fertilizer Quality Control and Assurance	2.41	3.28	2.29	0.25	1.00
6.	Availability of Fertilizers	2.91	2.96	2.53	0.13	1.11
7.	Seed availability module and Mobile App.	1.86	3.12	2.35	0.50	1.00

The above table shows that in the state Madhya Pradesh, Tamil Nadu, Gujarat and Sikkim officers perceived as very good to good for Literature on best practices in Agriculture and Allied Sector (Booklet, Success Stories, and Videos *etc*). Tamil Nadu had highest mean value was 3.44 (Good to Average) For Package of practices (including information on right type and dose of pesticides/insecticides and fertilizers and comprehensive agro-climatic zone-wise knowledge-base).

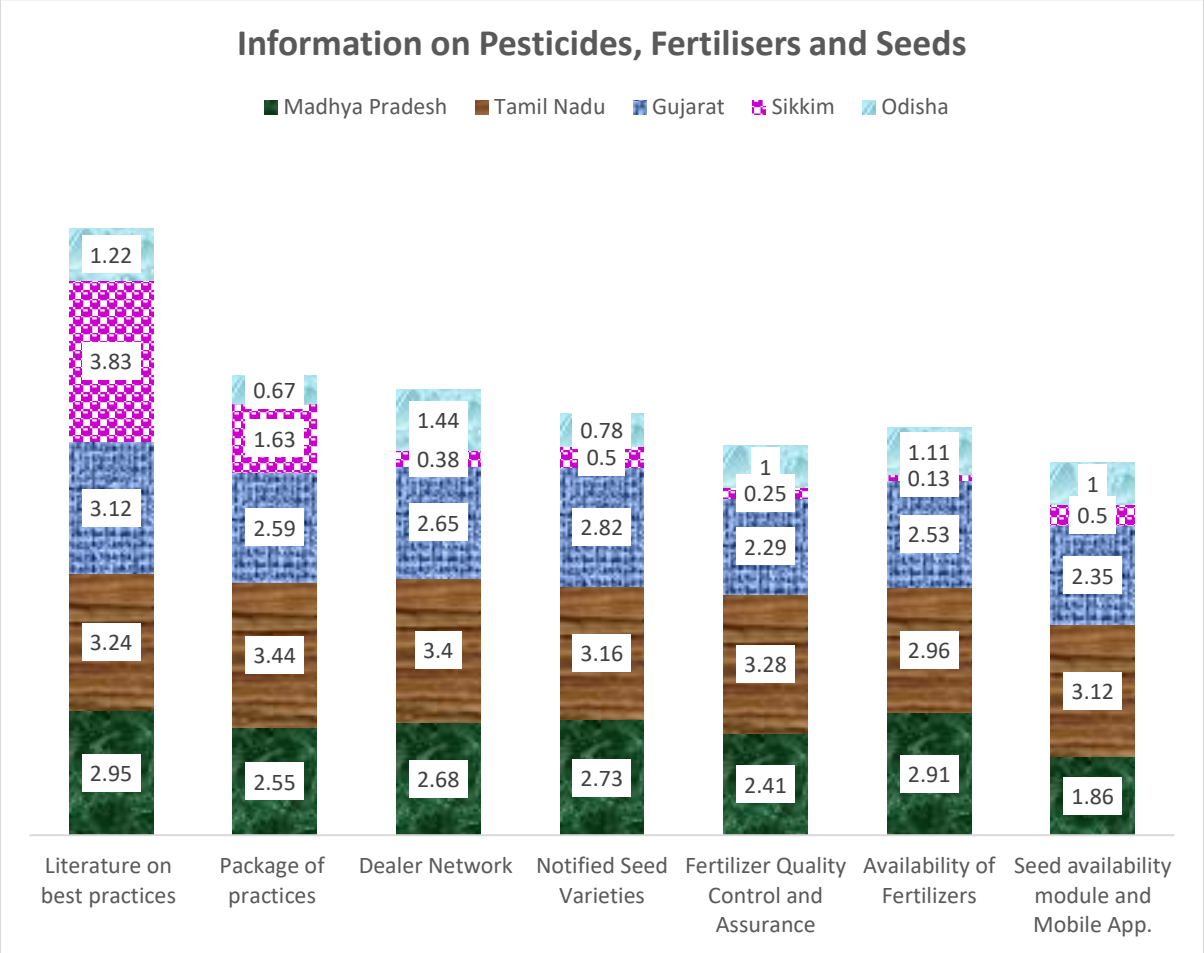


Table 10: Providing Information on Soil Health

S.No.	Service Details	Madhya Pradesh	Tamil Nadu	Gujarat	Sikkim	Odisha
8.	Information on Soil Health (Major and Micro nutrients and moisture)	2.68	3.56	2.82	2.54	2.33
9.	Organic farming (PGS India)	2.18	3.04	2.65	1.13	0.78

In the case of Information on Soil Health (Major and Micro nutrients and moisture Majority of officers perceived good to average (mean value 2.68, 2.82, 2.54 and 2.33) in Madhya Pradesh, Gujarat, Sikkim and Odisha simultaneously, while in Tamil Nadu perceived as very good to good (mean value 3.56).

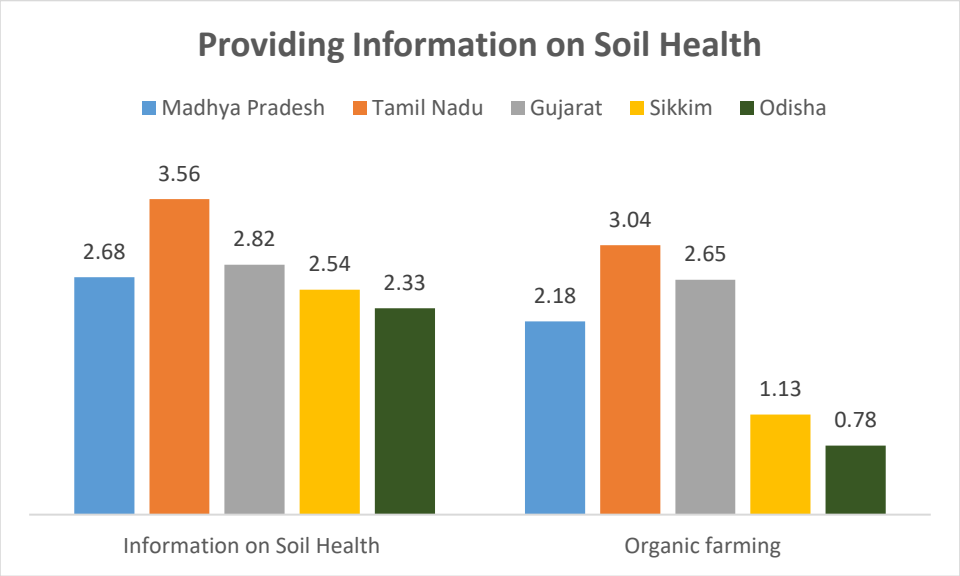


Table 11: Information on Crops, Farm Machinery, Training and GAPs

S.No.	Service Details	Madhya Pradesh	Tamil Nadu	Gujarat	Sikkim	Odisha
10.	Pesticide Registration	2.18	2.64	2.18	0.13	0.44
11.	Training Information System and Training Calendars	2.50	2.64	2.41	0.83	0.11

12.	Good Agriculture IPM Practices	2.45	3.52	2.29	2.58	1.00
13.	Availability of Farm Machinery	2.55	3.16	2.53	0.50	1.67
14.	Pest Prevention and Cure	2.36	3.00	2.59	1.67	0.33
15.	FARMAP (Costs of Cultivation)	1.77	2.48	2.47	0.63	0.33
16.	Crop Diseases	2.23	3.40	2.71	2.08	0.56
17.	Pest Infestation Status	2.27	3.00	2.06	0.04	0.56
18.	Pest Prevention and Cure	2.23	2.96	2.35	0.50	0.44

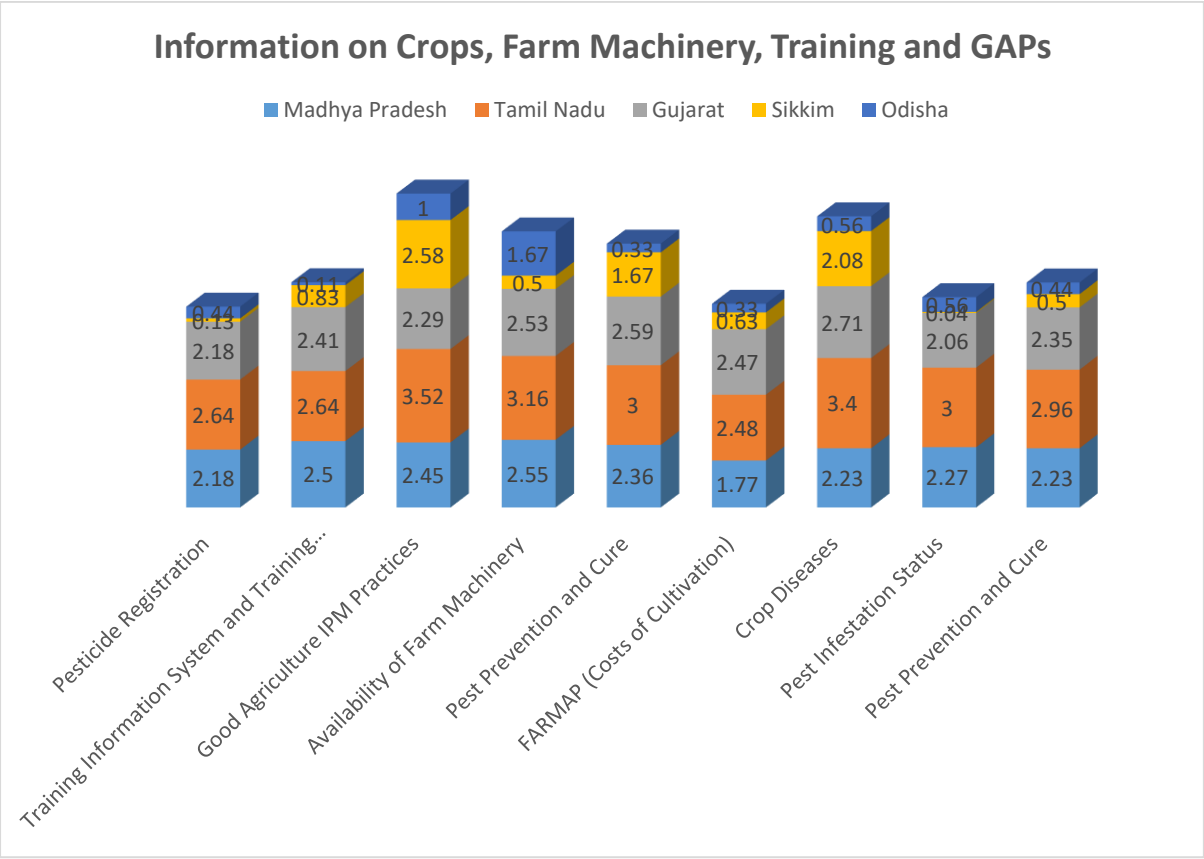


Table 12: Information on Forecasted Weather

S.No.	Service Details	Madhya Pradesh	Tamil Nadu	Gujarat	Sikkim	Odisha
19.	Forecasted Weather	1.91	3.36	2.94	1.58	1.22
20.	NOW CAST	1.55	2.64	1.47	0.63	0.89

For the information on forecasted weather Madhya Pradesh officers perceived as average to poor, Tamil Nadu officers perceived for forecasted weather very good to good and for NOW CAST good to average, Gujarat officers perceived that good (mean value 2.94) for forecasted weather and for NOW CAST preferred Average to poor. In the state Sikkim and Odisha perceived as majority do not know about the NOW CAST.

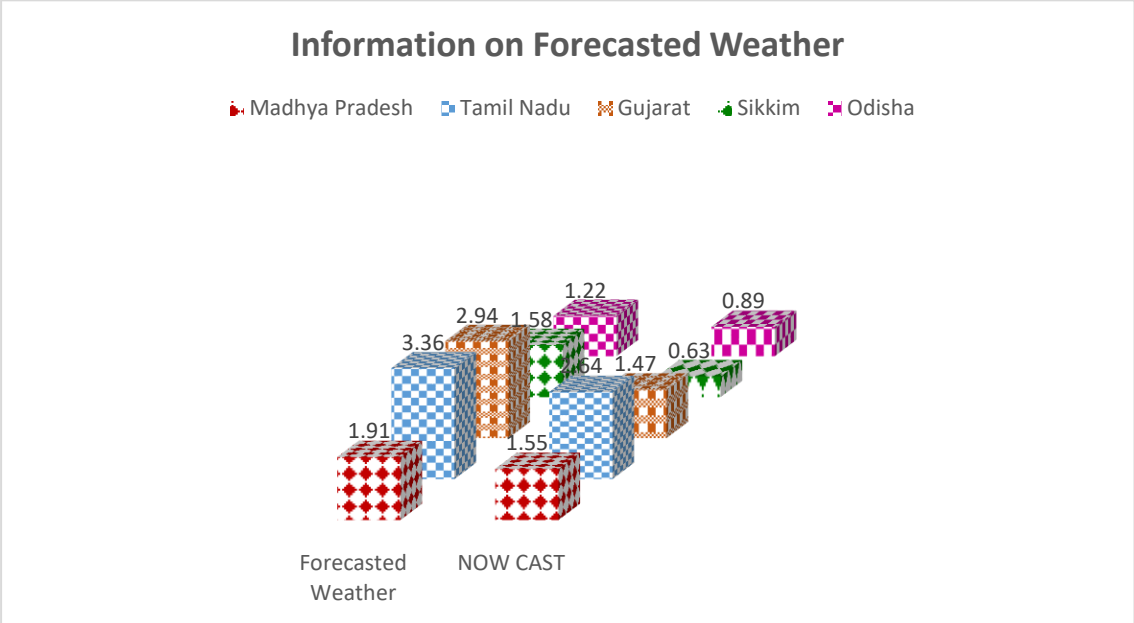


Table 13: Information on Prices, Arrivals, Procurement points and providing Interaction platform

S.No.	Service Details	Madhya Pradesh	Tamil Nadu	Gujarat	Sikkim	Odisha
21.	Price Information	2.36	3.56	2.12	0.38	0.33
22.	Arrival Information	2.41	3.16	1.29	0.38	0.44

23.	MSP (Minimum Support Price)	2.23	3.20	2.35	0.63	0.44
24.	Historical Price Trend	2.32	3.16	2.18	0.50	0.33
25.	Historical Arrival Trend	2.14	2.80	2.06	0.25	0.33
26.	Buyer-Seller Platform	1.91	2.32	2.00	0.63	0.33
27.	GIS Based Interface	1.55	1.92	1.47	0.38	0.89

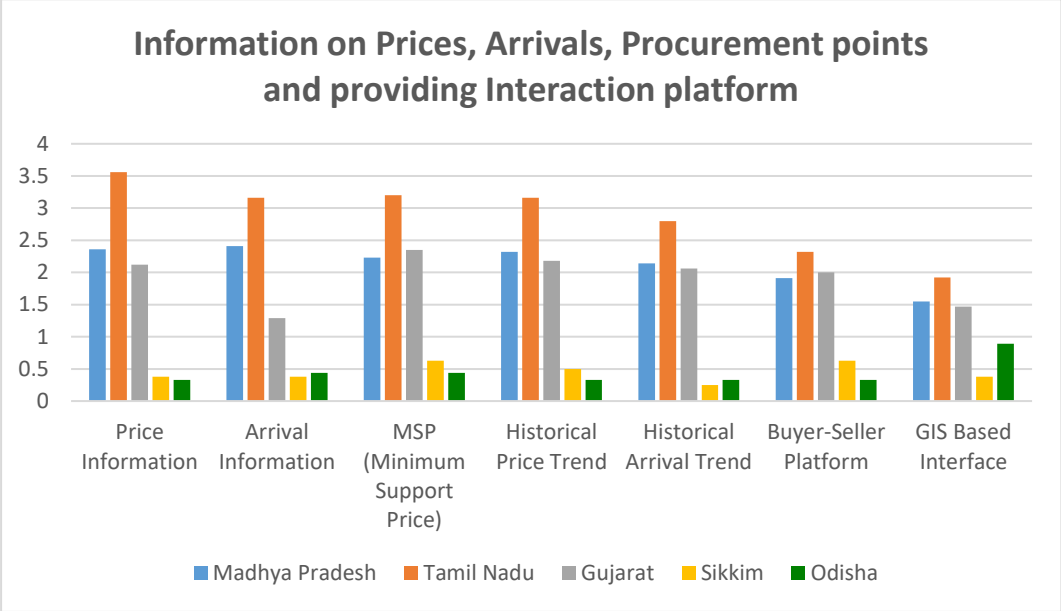


Table 14: Electronic Certification for Imports and Exports

S.No.	Service Details	Madhya Pradesh	Tamil Nadu	Gujarat	Sikkim	Odisha
28.	PQIS	1.41	1.44	1.47	0.25	0.44
29.	SIP (Sanitary Import Permit)	1.45	1.48	1.59	0.38	0.33
30.	EXIM of Seeds	1.59	1.44	1.41	0.25	0.33

Above tables shows that, in the state Madhya Pradesh, Tamil Nadu and Gujarat officers said that services on Electronic Certification for Imports and Exports was average to poor while in the state Sikkim and Odisha majority officers mentioned that they don't know about these services.

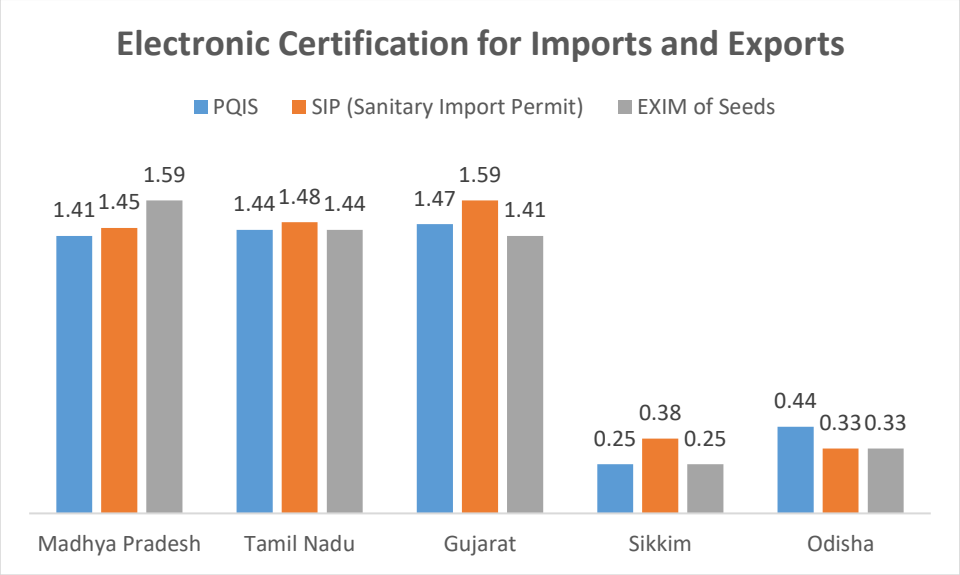
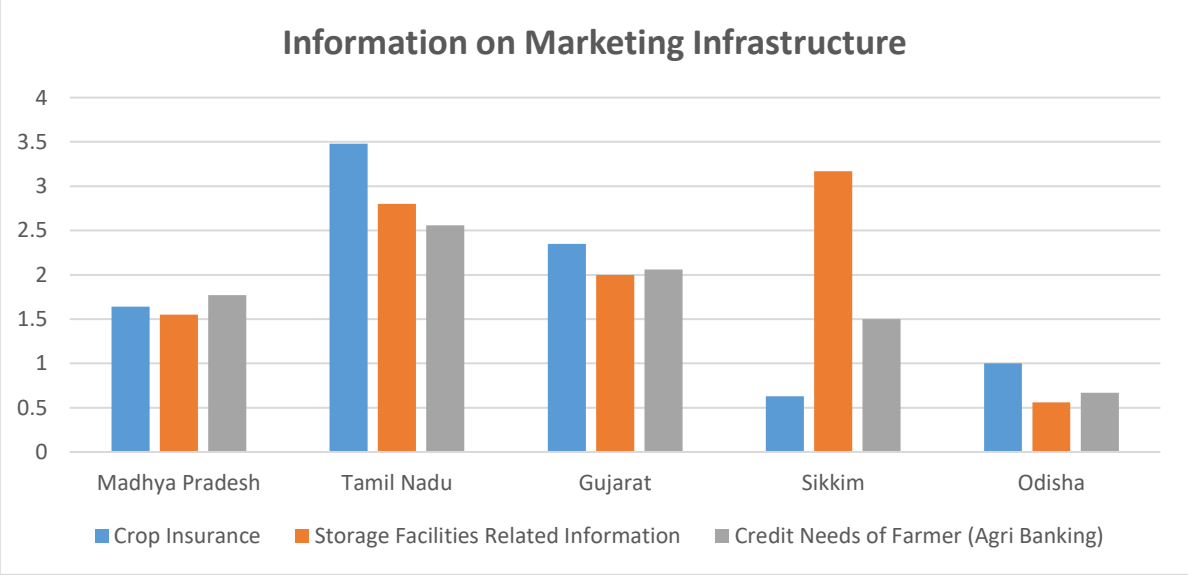


Table 15: Information on Marketing Infrastructure

S.No.	Service Details	Madhya Pradesh	Tamil Nadu	Gujarat	Sikkim	Odisha
31.	Crop Insurance	1.64	3.48	2.35	0.63	1.00
32.	Storage Facilities Related Information	1.55	2.80	2.00	3.17	0.56
33.	Credit Needs of Farmer (Agri Banking)	1.77	2.56	2.06	1.50	0.67

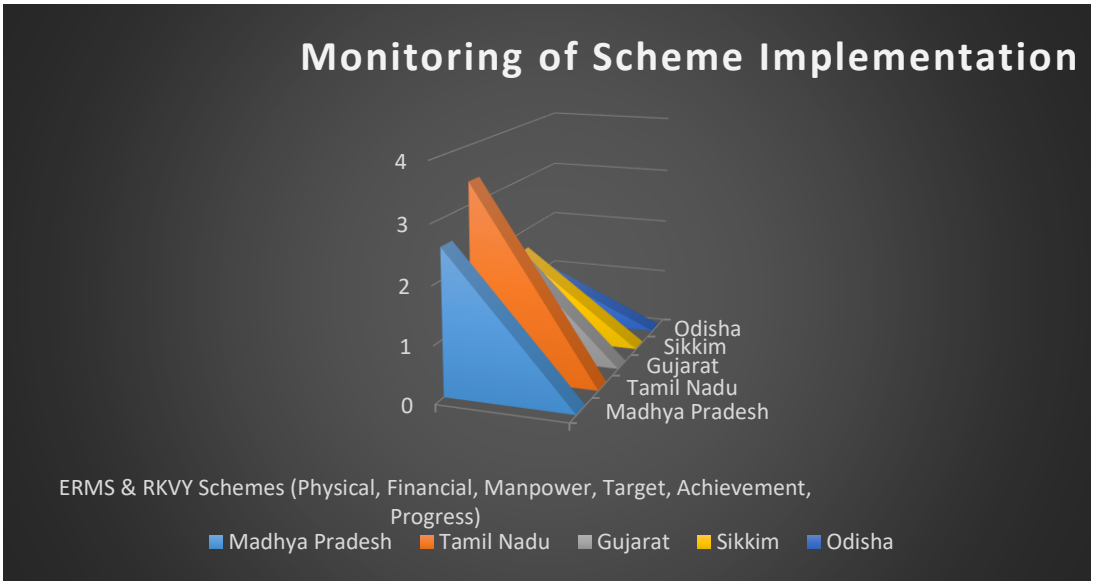


In Madhya Pradesh state majority of officers said that poor to do not know for Information on Marketing Infrastructure while in case of Tamil Nadu mention it as

good and in Gujarat as average service. In Sikkim state they mentioned only Storage Facilities Related Information as good.

Table 16: Monitoring of Scheme Implementation

S.No.	Service Details	Madhya Pradesh	Tamil Nadu	Gujarat	Sikkim	Odisha
34.	ERMS & RKVY Schemes (Physical, Financial, Manpower, Target, Achievement, Progress)	2.55	3.40	2.18	1.63	1.00



In the case of Monitoring of Scheme Implementation Madhya Pradesh and Gujarat officers perceived as good to average and Tamil Nadu officers said that very good to good. Sikkim sate officers mentioned it as poor to do not know and Odisha state officers said it poor (mean value 1.00).

Table 17: Information on Fishery

S.No.	Service Details	Madhya Pradesh	Tamil Nadu	Gujarat	Sikkim	Odisha
35.	Package of Practices and Best Practices (Fishery)	1.45	1.32	2.18	1.83	0.00
36.	Dealer Network on Fisheries	1.27	1.16	2.06	1.83	0.00

37.	System for Monitoring Inland Exercises (Fishery)	1.36	1.08	1.38	1.83	0.00
38.	Quality Control and Assurance (Fishery)	1.64	1.04	1.29	1.83	0.00

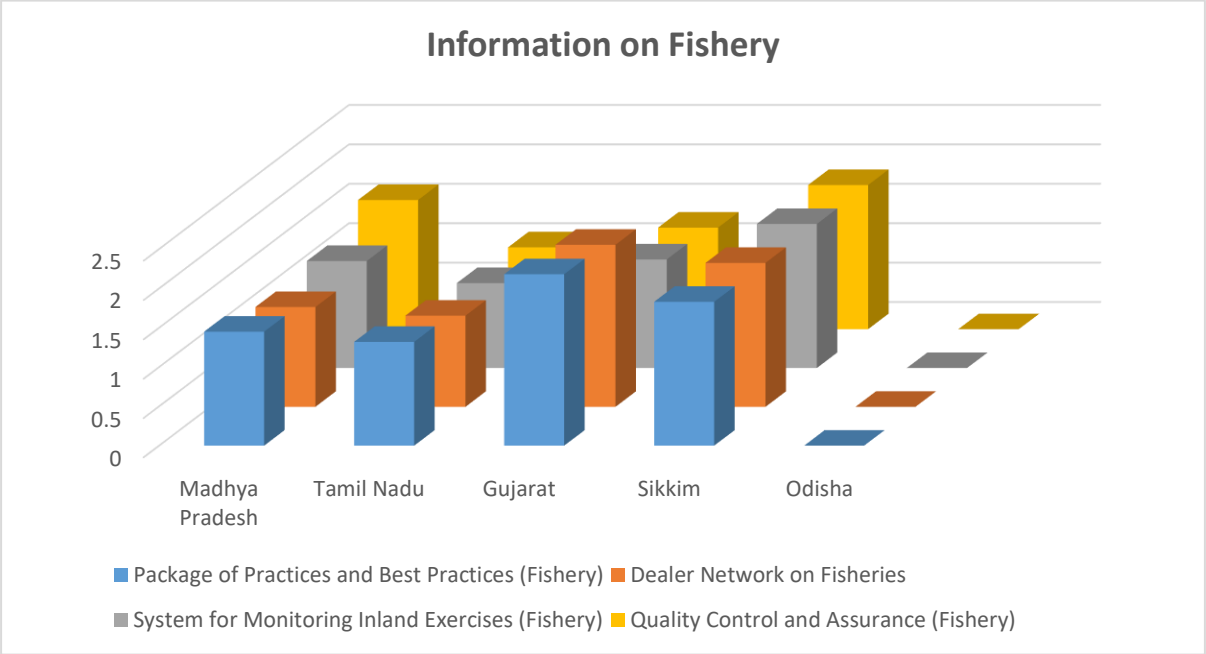


Table 18: Information on Irrigation Infrastructure

S.No.	Service Details	Madhya Pradesh	Tamil Nadu	Gujarat	Sikkim	Odisha
39.	Development of PMKSY portal	2.50	3.24	2.29	0.63	0.44

In the state Tamil Nadu, Madhya Pradesh and Gujarat officers perceived Information on Irrigation Infrastructure as good to average, Tamil Nadu state officers said that good and Sikkim and Odisha officers mentioned as do not know.

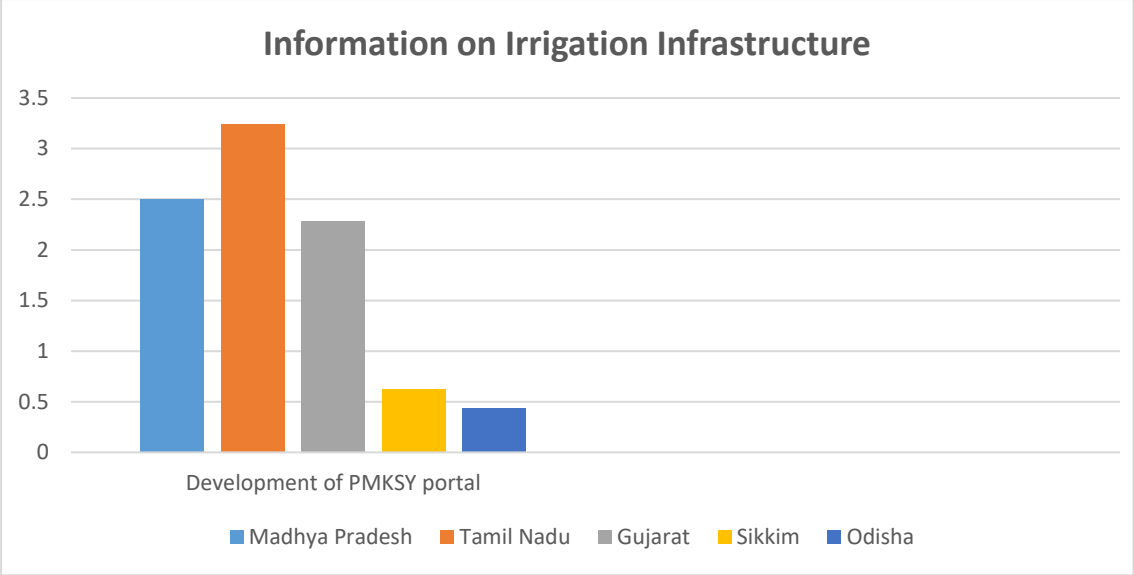


Table 19: Drought Relief and Management

S.No.	Service Details	Madhya Pradesh	Tamil Nadu	Gujarat	Sikkim	Odisha
40.	District Level Contingency Plans	1.23	2.56	2.65	0.25	0.89
41.	NADAMS (Past/Present trends and management by linking with inputs from the States)	0.72	2.20	2.06	0.25	0.78
42.	Hailsorm App (Mobile app developed for uploading data and Photographs with LAT-LONG info on Bhuwan platform)	0.95	2.12	1.29	0.33	0.67

Tamil Nadu and Gujarat officers perceived good to average for Drought Relief and Management while in the state MaPradesh, Sikkim and Odisha officers mentioned as poor to do not know.

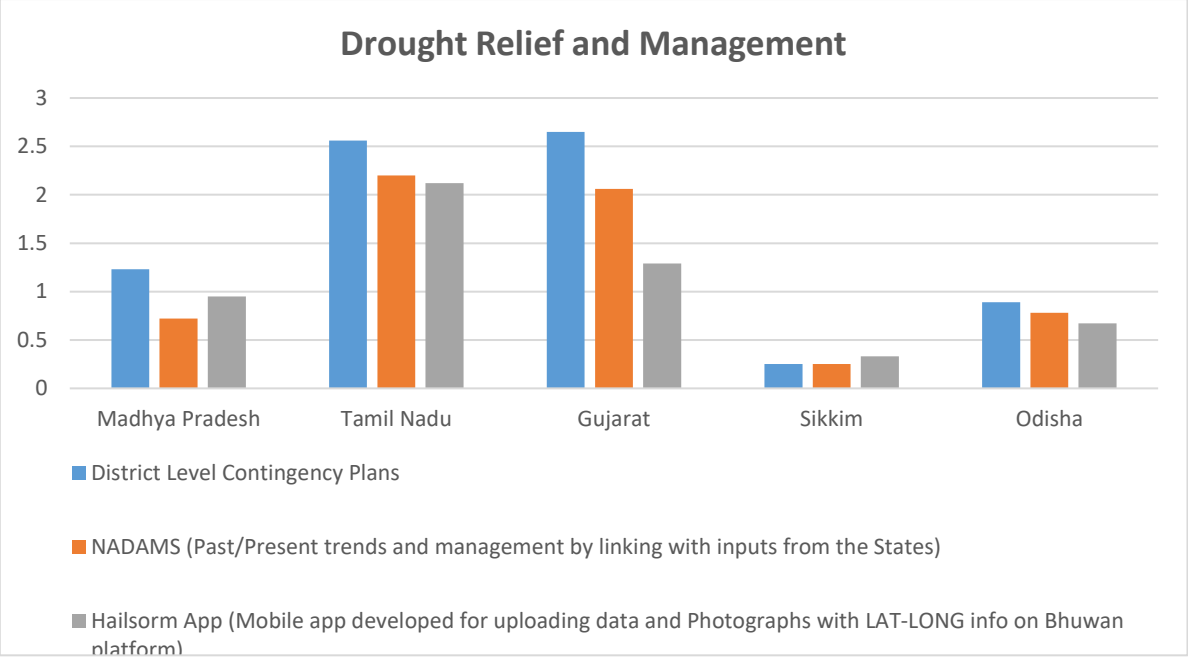
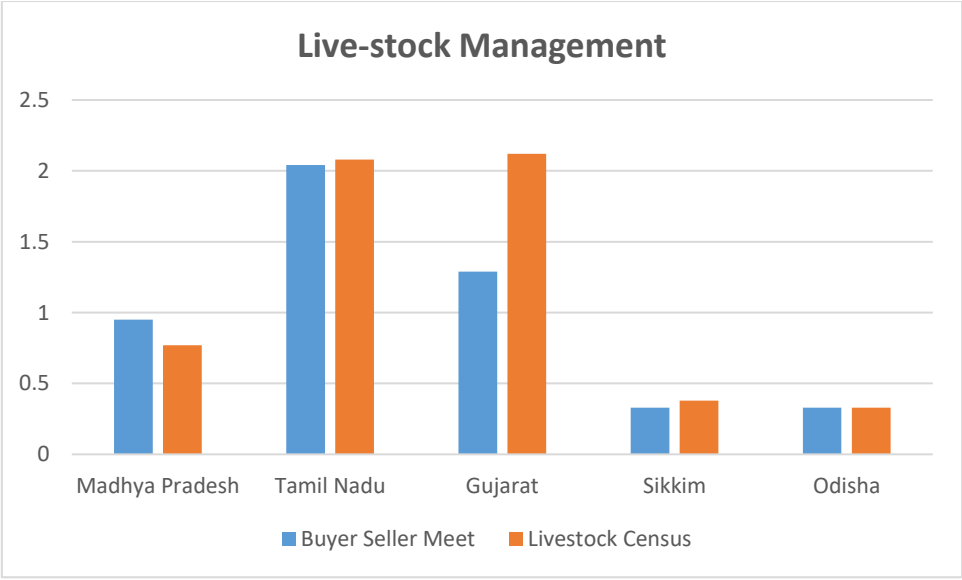


Table 20: Live-stock Management

S.No.	Service Details	Madhya Pradesh	Tamil Nadu	Gujarat	Sikkim	Odisha
43.	Buyer Seller Meet	0.95	2.04	1.29	0.33	0.33
44.	Livestock Census	0.77	2.08	2.12	0.38	0.33



At last we can concluded that almost all State Nodal officers agreed that Farmer portal and Apps under NeGP-A are good initiatives by GOI. This portal and Apps provide a lot of information about the Agriculture sector at one place. Information on new GOI mobile apps, dealers, crop management, risk management etc. is quickly available that is otherwise difficult to find.

Majority of the States organized awareness and training programmes on Farmer portal and Apps, for agricultural officers at State Institutes and also as part of induction training provided to new officers joining the Agriculture department. Majority of Nodal officers mentioned that awareness regarding portals and Apps was not up to the desired level among the farmers. There is a need for awareness campaigns regarding portals and Apps among farmers. Officers also suggested that regular updation of portals and Apps data should be carried out for effective and efficient use of information. Content should be in vernacular language. There should be an option to update the information on availability of inputs in real time.

From the above discussion it can be concluded that there is a need for awareness campaign among farmers and all the services under NeGP-A should be in local/regional language. The service delivery should be in a two way interaction mode i.e. farmers can interact with the system to get answers for their query.

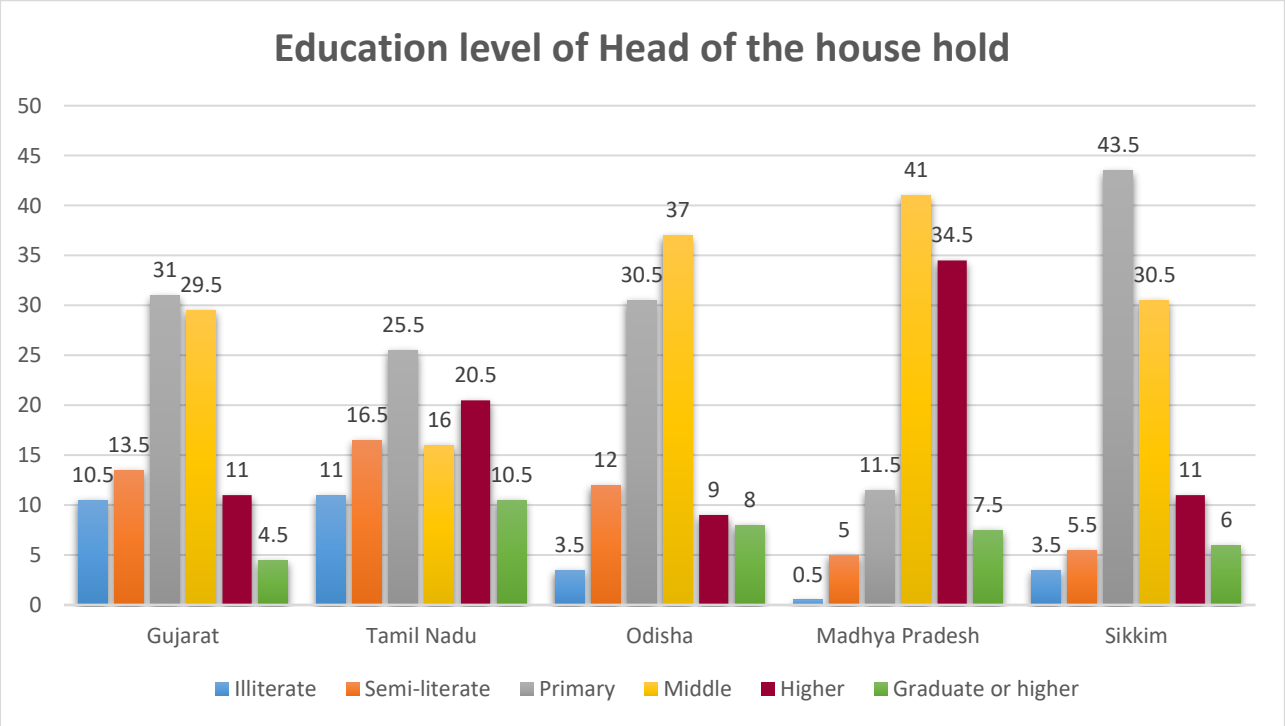
FARMERS' PERCEPTION

Farmers are end users of services under NeGP-A. It is most important to know about farmer's attitude and perception regarding NeGP-A services. Following are some key points relating to perception of farmers of states studied.

Under NeGP-A various modes of delivery of services have been envisaged. These include internet, touch screen kiosks, electronic media, mobile phones (broadcast, Interactive Voice Response System, interactive messaging using Unstructured Supplementary Service Data and Voice Recognition), KVKs, agri-clinics, private kiosks, mass media, Common Service Centres, Kisan Call Centres etc. Using all these services requires a certain level of literacy. The following table shows the education level of farmers in studied states.

Table 1: Education level of Head of the house hold

State	Illiterate	Semi-literate	Primary	Middle	Higher	Graduate or higher
Gujarat	10.5	13.5	31	29.5	11	4.5
Tamil Nadu	11	16.5	25.5	16	20.5	10.5
Odisha	3.5	12	30.5	37	9	8
Madhya Pradesh	0.5	5	11.5	41	34.5	7.5
Sikkim	3.5	5.5	43.5	30.5	11	6
Grand Total	**5.8**	**10.5**	**28.4**	**30.8**	**17.2**	**7.3**

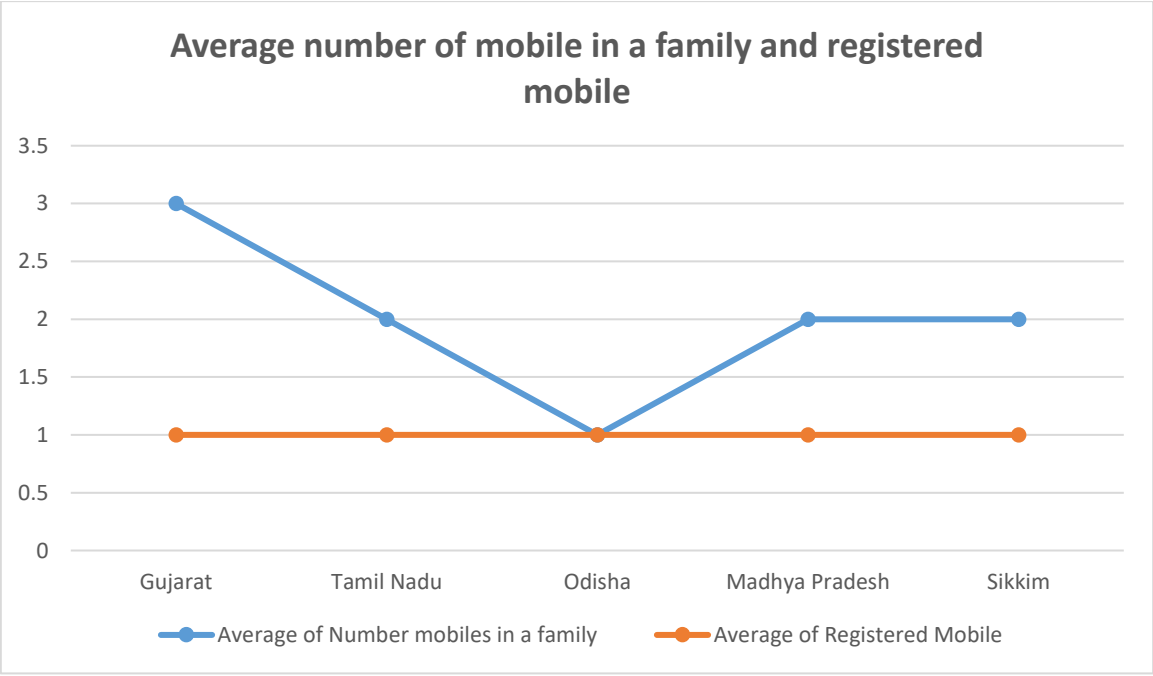


Graph 1: Education level of Head of the house hold

In Madhya Pradesh 41.00 percent of farmers are educated upto higher school level while in Odisha only 37 percent of farmers are educated upto middle school level. The education level of most of the farmers (43.50%) in Sikkim state was primary level. In Gujarat 31.00 per cent of farmers are educated upto primary school level. It can be also seen in graph 1 that very few number (7.3 %) of farmers had graduate or higher education level. Majority of farmers had primary and middle level of education.

Table 2: Average number of mobiles in a family and registered mobile

State	Average Number of mobiles in a family	Average of Registered Mobile
Gujarat	3	1
Tamil Nadu	2	1
Odisha	1	1
Madhya Pradesh	2	1
Sikkim	2	1
Grand Total	**2**	**1**



Graph 2: Average number of mobiles in a family and registered mobile

In this information era, use of mobile phones has gone up in all parts of the country, whether it is rural or urban, with the availability of multiple services. This is growing as it has become a necessity for all. These days a mobile phone is used for various services, apart from talking. It has also become a source of entertainment for many. People spend a lot on mobile phones.

Perusal of Table 2 also shows that average number of mobile phones in a family, in studied states, were more than one, but the registration of mobile in NeGP-A services was comparatively low. The reason for low registration of mobile may be due to few number of family members engaged in farming, lack of awareness about mobile apps and speed of internet in the village. The country is still lagging in data services, Speed is the main problem. Service providers might claim that they are providing high speeds but the average speed remains low. A lot needs to be done in this direction.

Graph 2 shows that gap between availability of mobile and registered mobile for NeGP-A services was maximum in Gujarat state and minimum in Odisha state. The wide gap shows that in Gujarat state there is a need for awareness campaign regarding mobile apps of NeGP-A Scheme.

Table 3: Access to Traditional media

State Name	Access to Radio%	Access to Television%	Access to print media%
Gujarat	40.5	98.5	75.5
Tamil Nadu	16.5	78	58
Odisha	15	96.5	78.5
Madhya Pradesh	33.5	92.5	22.5
Sikkim	12.5	97.5	12.5
Grand Total	**23.6**	**92.6**	**49.4**

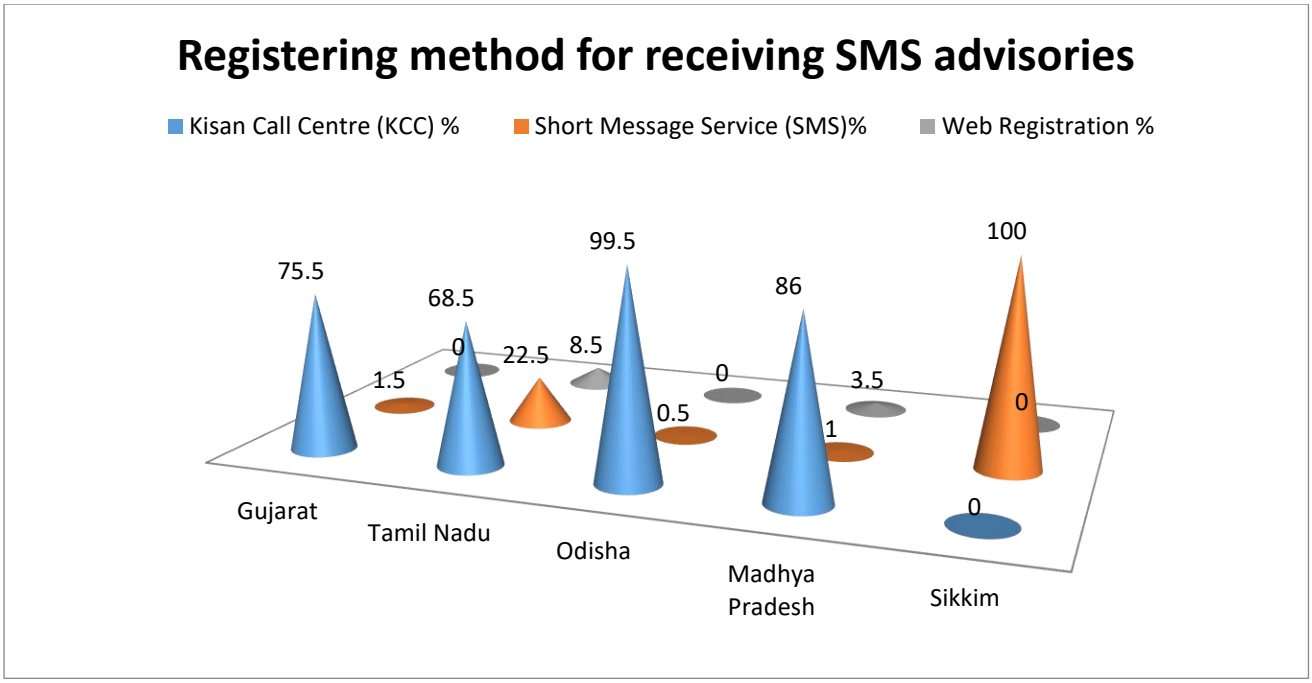
Graph 3: Access to Traditional media

Traditional mass media channels, viz., radio, print and television had been instrumental in India's agricultural technology transfer. The role of traditional media has been very significant in rural development since the turn of this century, and with the advent of new media. A perusal of table 3 shows that 92.6 percent of the respondents were accessing television followed by print media (49.4%) and then radio (23.6). Television is a prestigious, powerful and empowering tool that is used to raise awareness, generate discussion and increase knowledge. It is also true that if we want to penetrate the message of development among the rural masses we would have to opt for the traditional media forms of this country in a more planned manner.

Table 4: Registering method for receiving SMS advisories

State Name	Kisan Call Centre (KCC) %	Short Message Service (SMS)%	Web Registration %	Registered by Extension Functionary %
Gujarat	75.5	1.5	0	23
Tamil Nadu	68.5	22.5	8.5	0.5
Odisha	99.5	0.5	0	0
Madhya Pradesh	86	1	3.5	9.5
Sikkim	0	100	0	0
Grand Total	**65.9**	**25.1**	**2.4**	**6.6**

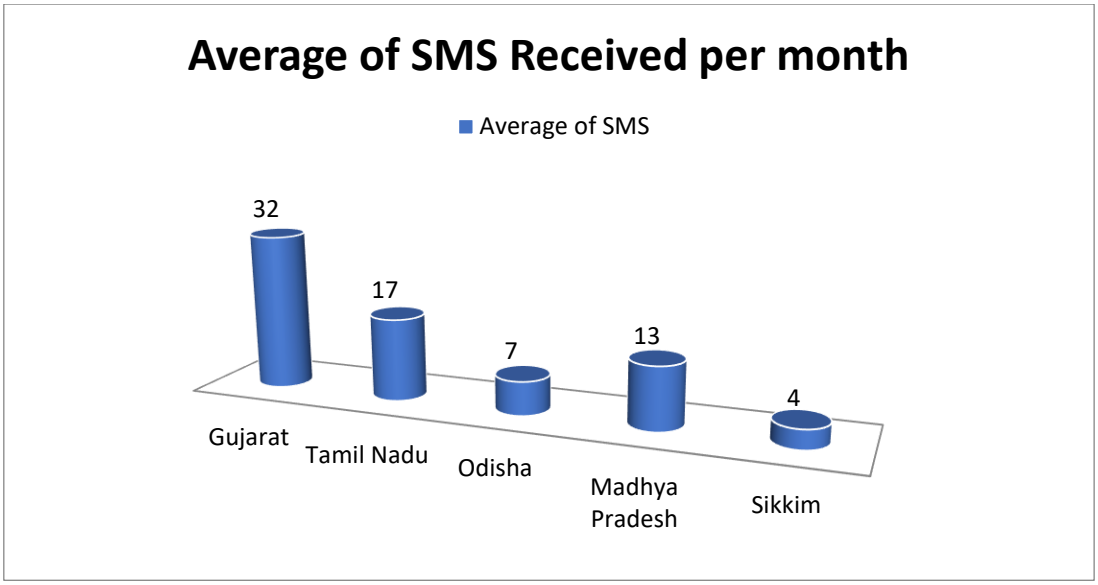
There are various options for enrolling farmers for SMS advisories including Database of KCCs, Registration on a Web Portal through Common Service Centers & Internet Kiosks, manually filled form followed by data entry on the portal, Tablet PCs, IVRS etc. In the states of Madhya Pradesh, Odisha and Gujarat maximum number of farmers registered through Kisan Call Centre (KCC) and in Sikkim, all farmers registered through short message service (SMS). No farmer was registered by extension functionaries in Odisha and Sikkim. Graph 2 shows that in Odisha, the gap between available mobile and registered mobile is minimum so it may be due to the method followed (Kisan Call Centre) for registering of receiving SMS advisories.



Graph 4: Registering method for receiving SMS advisories

Table 5: Average of SMS Received per month

State Name	Average of SMS
Gujarat	32
Tamil Nadu	17
Odisha	7
Madhya Pradesh	13
Sikkim	4
Grand Total	**15**



Graph 5: Average of SMS Received per month

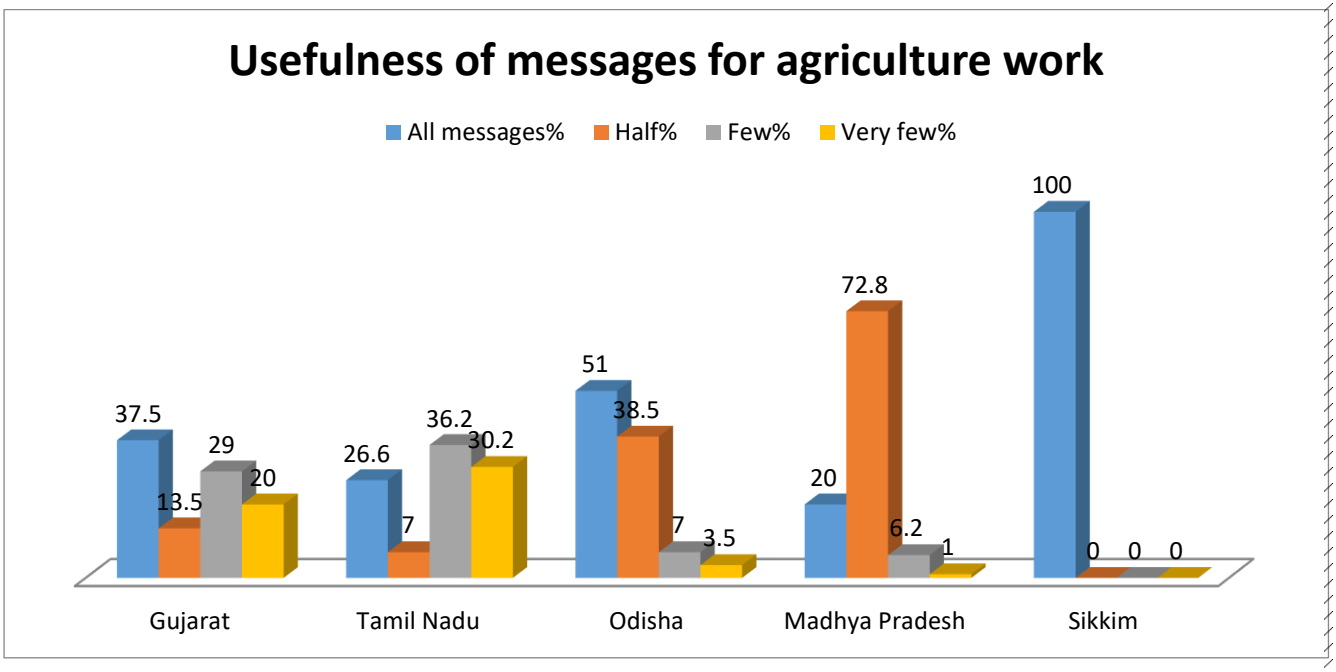
The SMS function offered by even the most basic handset can be used to provide data to farmers that they previously would not have had access to. Table 5 shows that Gujarat received maximum number of messages in a month while perusal of table 6 shows that only 37.5 percent farmers agreed that all messages were useful for them while in Tamil Nadu majority of farmers mentioned that only few and very few messages were useful for them. In the state of Sikkim the number of received messages is minimum and all messages were found useful for farmers. So it can be suggested that instead of increasing the number of messages, selected and appropriate messages should be sent to farmers. (Table 5 and 6)

Table 6: How many of these messages, the advisory/information contained is directly usable for you in your agriculture work

State Name	All messages%	Half%	Few%	Very few%
Gujarat	37.5	13.5	29.0	20.0
Tamil Nadu	26.6	7.0	36.2	30.2
Odisha	51.0	38.5	7.0	3.5
Madhya Pradesh	20.0	72.8	6.2	1.0

Sikkim	100.0	0.0	0.0	0.0
Grand Total	**47.2**	**26.2**	**15.7**	**11.0**

Mobile networks are unique and provide an unparalleled opportunity to give rural smallholders access to information that could transform their livelihoods. Table 5 shows that Sikkim state received 4 SMS per month on an average and all these messages were useful for agriculture work as indicated in Table 6. SMS communication should meet farmers' specific needs & relevance at a particular point of time for effective agricultural development. Table 6 shows that in Madhya Pradesh 72.8 percent of famers and in Odisha 38.5 percent of farmers expressed that only half of the messages were useful for them. In Tamil Nadu, 66.4 percent of farmers reported that only few or very few messages were useful to them. This might have been due to the information not being relayed to the farmers at the right stage of the crop or the information not being relevant to the crops they were growing.



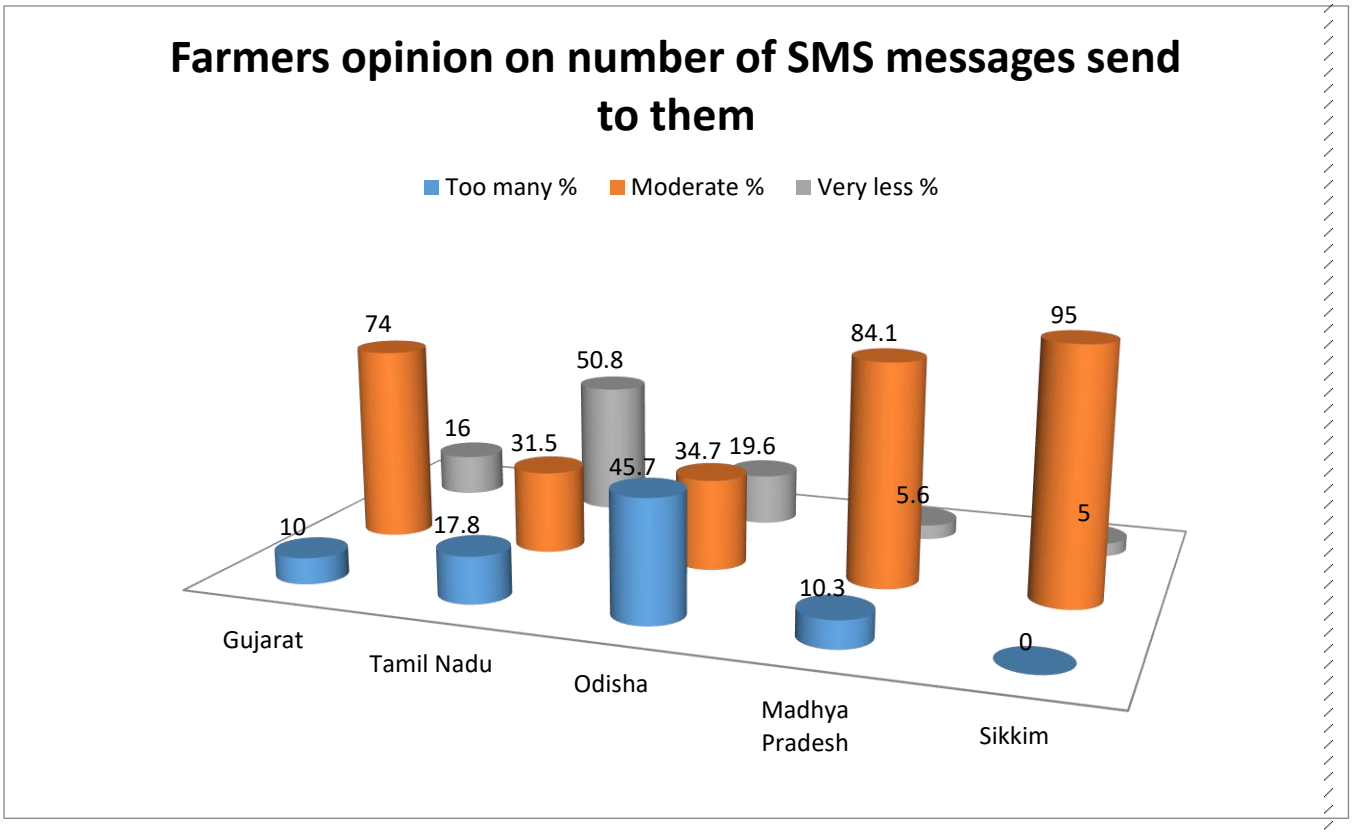
Graph 6: Usefulness of messages for agriculture work

Table 7: Farmers opinion on number of SMS messages sent to them

State Name	Too many %	Moderate %	Very less %

Gujarat	10.0	74.0	16.0
Tamil Nadu	17.8	31.5	50.8
Odisha	45.7	34.7	19.6
Madhya Pradesh	10.3	84.1	5.6
Sikkim	0.0	95.0	5.0
Grand Total	**16.8**	**63.9**	**19.4**

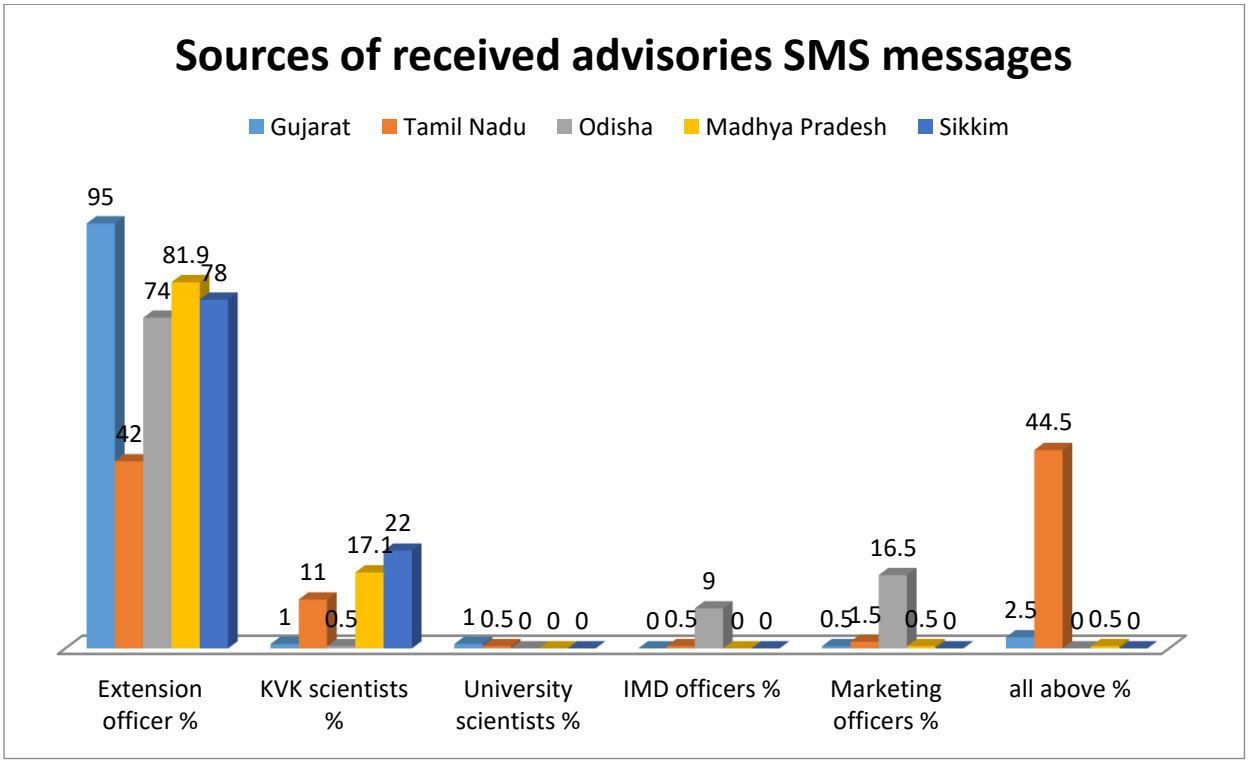
Mobile messages play a key role in fulfilling the agricultural information needs of the farmers due to the number of advantages such as easy and convenient access, reach to areas where there is no other ICT infrastructure like internet, fixed lines etc., and is easily afforded by farmers. Table 7 shows that Majority of farmers reported that number of messages sent to them were moderate.



Graph 7: Farmers opinion on number of SMS messages sent to them

Table 8: Sources of received advisories SMS messages

State Name	Extension officer %	KVK scientists %	University scientists %	IMD officers %	Marketing officers %	all above %
Gujarat	95.0	1.0	1.0	0.0	0.5	2.5
Tamil Nadu	42.0	11.0	0.5	0.5	1.5	44.5
Odisha	74.0	0.5	0.0	9.0	16.5	0.0
Madhya Pradesh	81.9	17.1	0.0	0.0	0.5	0.5
Sikkim	78.0	22.0	0.0	0.0	0.0	0.0
Grand Total	**74.1**	**10.3**	**0.3**	**1.9**	**3.8**	**9.6**

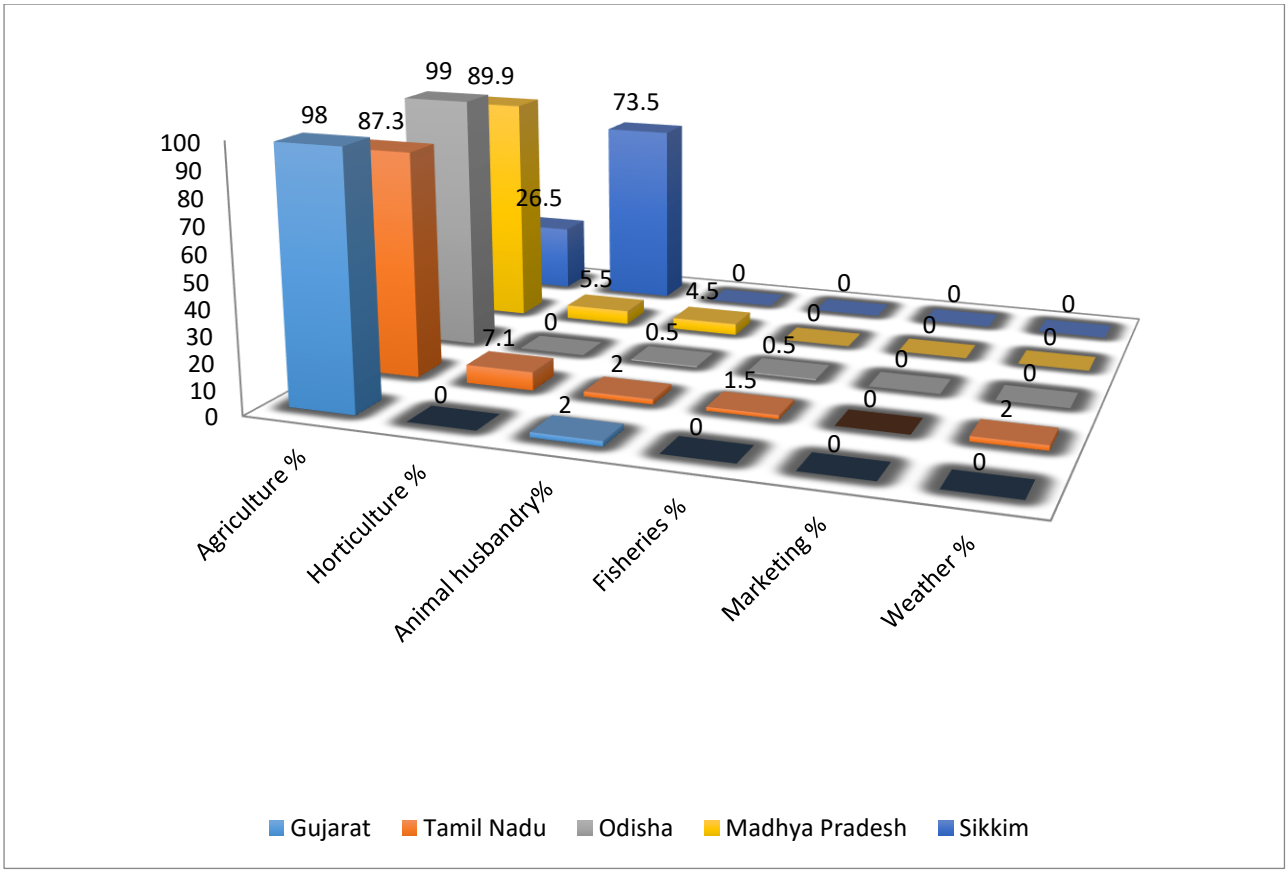


Graph 8: Sources of received advisories SMS messages

According to the Telecom Regulatory Authority of India, the number of mobile phone subscribers has reached 867.80 million as on March 2013 and India is the second largest wireless market in the world (TRAI, June, 2013). Further, rural subscribers are continuously increasing every month, as compared to urban subscribers. The increasing trend in mobile phone use, particularly in remote rural areas, provides an opportunity to bridge the rural and urban digital divide. Table 8 shows that the main source of received messages was extension officers in all states. Messages send by Scientists (of KVK and University) was very low in the studied states. There is need to involve scientists in message development. Although mobile phone can help in disseminating agricultural information to improve the farm productivity and rural incomes, trustworthiness of information (source of message) is one of the important aspects to be considered while delivering to farmers to meet their needs and expectations.

Table 9: Topics Covered in advisories SMS

State Name	Agriculture %	Horticulture %	Animal husbandry %	Fisheries %	Marketing %	Weather %
Gujarat	98.0	0.0	2.0	0.0	0.0	0.0
Tamil Nadu	87.3	7.1	2.0	1.5	0.0	2.0
Odisha	99.0	0.0	0.5	0.5	0.0	0.0
Madhya Pradesh	89.9	5.5	4.5	0.0	0.0	0.0
Sikkim	26.5	73.5	0.0	0.0	0.0	0.0
Grand Total	**80.1**	**17.3**	**1.8**	**0.4**	**0.0**	**0.4**

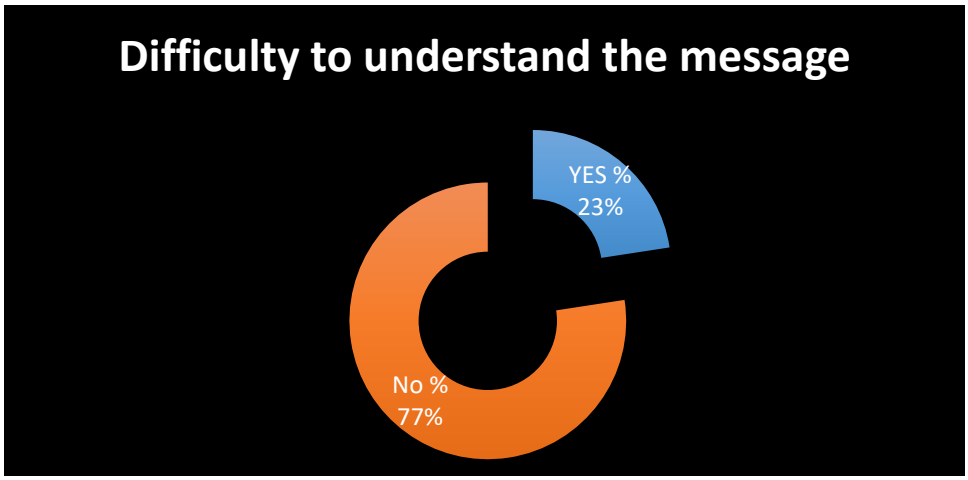


Graph 9: Topics Covered in advisories SMS

Mobile phone services are helping in improving agricultural yield and profits by providing farmers advice on crops, weather and market prices. Table 9 shows that the topic covered maximum in SMS was agriculture in almost all states except Sikkim. In Sikkim maximum SMSs were on Horticulture, which is due to the main crop of Sikkim state being horticultural crops. The mobile messages delivered to registered farmers contained agricultural information covering different aspects of fertilizer application, pesticide application, pest management, disease management, best agricultural practices, seed varieties, seed treatment, weeding and government schemes. A perusal of Graph 7 shows that SMS related to Animal Husbandry, Fisheries, Marketing and weather were minimal. There is a need for development of information on Fisheries, Animal Husbandry, Marketing and weather.

Table 10: Difficulty in understanding the message

State Name	YES %	No %
Gujarat	19.60	80.40
Tamil Nadu	15.46	84.54
Odisha	8.50	91.50
Madhya Pradesh	66.83	33.17
Sikkim	2.50	97.50
Grand Total	**22.58**	**77.42**

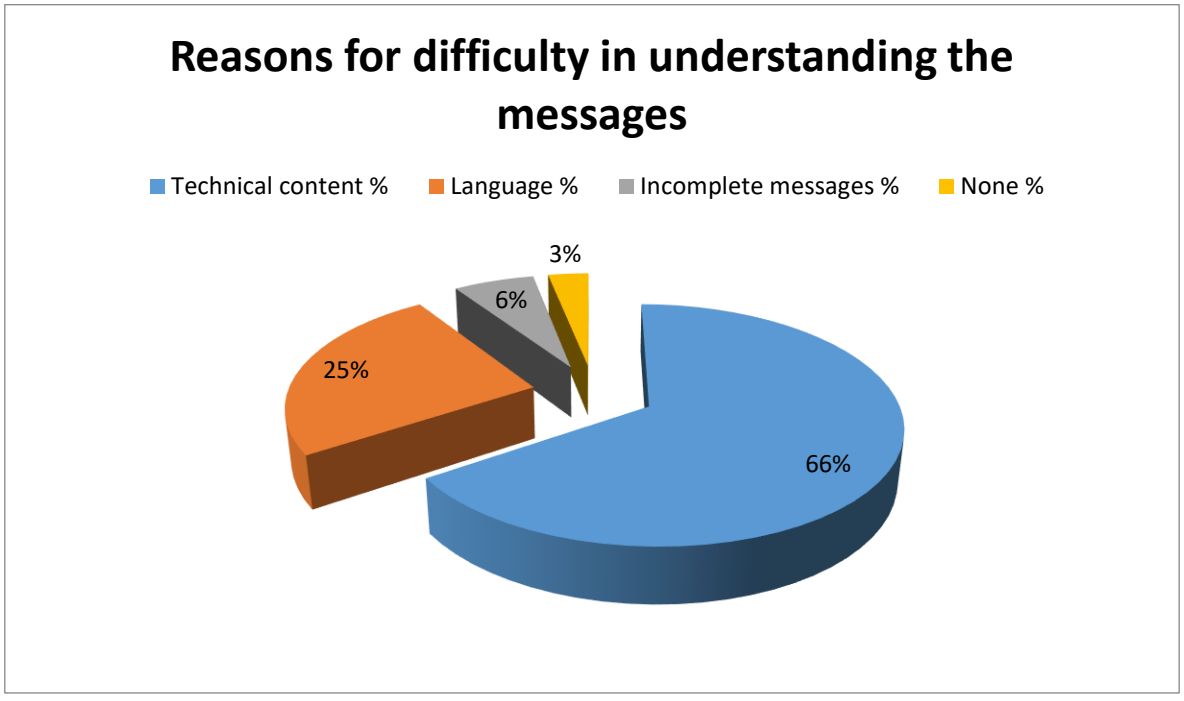


Graph 10: Difficulty in understanding the message

A perusal of table 10 shows that majority of farmers in Madhya Pradesh reported that they have difficulty in understanding messages. Except Madhya Pradesh, more than 80 percent of farmers from other states expressed that they have no difficulty in understanding messages.

Table 11: Reasons for difficulty in understanding the messages

State Name	Technical content %	Language %	Incomplete messages %	None %
Gujarat	28.21	64.10	5.13	2.56
Tamil Nadu	63.33	30.00	3.33	3.33
Odisha	41.18	52.94	5.88	0.00
Madhya Pradesh	82.71	6.77	7.52	3.01
Sikkim	0.00	80.00	0.00	20.00
Grand Total	**65.63**	**25.00**	**6.25**	**3.13**



Graph 11: Reasons for difficulty in understanding the messages

Table 11 has been furnished with data on Reasons for difficulty in understanding the messages and the data reveals that majority of the farmers in Madhya Pradesh reported that they had difficulty in understanding the messages due to the technical content of messages. It is recommended to the senders that treatment of the message may be done wherein technical terminology could be changed to local known terminology before sending the messages to farmers. In Sikkim state 80.00 per cent of Farmers reported that there was difficulty in understanding the messages due to the language. It is suggested that all the services under NeGP-A in the state should be in local/regional language. 6.25 per cent farmers from all states also reported that they faced problem in understanding the messages due to incomplete messages, so it is suggested that Completeness of the message may be ensured. Message should be SMART (S- Simple, M- Measurable, A- Attractive, R- Reliable and T- Timely).

Table 12: Feedback about level of convenience in registering for SMS advisory

State Name	Excellent %	Very Good %	Good %	Average %	Poor %
Gujarat	7.50	49.50	32.00	9.00	2.00
Tamil Nadu	7.58	14.14	21.72	37.88	18.69
Odisha	8.50	38.00	47.50	5.50	0.50
Madhya Pradesh	7.29	17.71	23.44	51.56	0.00
Sikkim	0.50	32.50	55.00	12.00	0.00
Grand Total	**6.26**	**30.51**	**36.06**	**22.93**	**4.24**

There are various options for enrolling farmers for SMS advisories including Database of KCCs, Registration on a Web Portal through Common Service Centers & Internet Kiosks, manually filled form followed by data entry on the portal, Tablet PCs,

IVRS etc. Table 12 shows that majority of farmers agreed that level of convenience in registering for SMS advisory was very good or good.

Table 13: Opinion about the length of the message

State Name	Very Lengthy %	Moderate %	Short %	Very short %
Gujarat	1.50	68.00	28.00	2.50
Tamil Nadu	16.50	22.00	31.50	30.00
Odisha	3.00	69.50	27.50	0.00
Madhya Pradesh	38.27	61.73	0.00	0.00
Sikkim	0.50	82.00	17.50	0.00
Grand Total	**11.85**	**60.64**	**20.98**	**6.53**

In table 11, among the Reasons for difficulty in understanding the messages it has already been mentioned that only 6.25 per cent farmers reported that Incomplete messages was a reason for difficulty in understanding messages. Table 13 also shows that majority (60.64) of farmers agreed that length of the message was moderate.

Table 14: Language of SMS (yes %)

State Name	receive messages in local language on your mobile phone	Is the language of SMSs clearly understandable	Do all the messages you receive relate to Agriculture and allied areas
Gujarat	93.00	90.50	42.50
Tamil Nadu	33.33	35.86	39.09
Odisha	84.50	89.00	90.00
Madhya Pradesh	97.45	87.76	90.91

Sikkim	0.00	93.50	46.50
Grand Total	**61.57**	**79.38**	**61.81**

Table 14 shows that more than 80 per cent farmers agreed that they received messages in local language in Gujarat, Odisha and Madhya Pradesh except Sikkim and Tamil Nadu. It was already mentioned in Table 11 that, 80.00 per cent of Farmers in Sikkim and 30 Per cent of Farmers in Tamil Nadu said that there was difficulty in understanding the message due to language. Majority of farmers reported that language of SMS is clearly understandable to them except for farmers in Tamil Nadu state. Approximately 90.00 per cent of the farmers of Madhya Pradesh and Odisha state expressed that messages they received related to Agriculture and allied areas while in Gujarat state only 42.50 per cent farmers reported that the messages were related to agriculture and allied areas. Gujarat received maximum number of message in a month (table 4), so it can be concluded that the number of messages was too many in Gujarat and not related to agriculture and allied sectors. Farmers of Sikkim also mentioned that only 46.50 per cent of the messages were related to agriculture and allied sectors.

Table 15: Registration for Market information (Yes (%))

State Name	Have you registered for Mandi/Market Prices on SMS	Is the mandi/ Market price received over SMS upto date	Have you been able to obtain better price of your produce based on the price information received by you on your mobile
Gujarat	53.50	47.62	42.49
Tamil Nadu	6.53	4.02	4.59

Odisha	27.50	8.24	16.20
Madhya Pradesh	2.58	1.55	1.74
Sikkim	0.00	0.00	0.00
Grand Total	**18.13**	**12.08**	**12.96**

Table 11 showed that very few percent (18.13 %) of farmers have registered for market price on SMS. Even in Sikkim state none of the farmers registered for market price on mobile. Only 12 per cent of farmers agreed that the mandi/ Market price received over SMS is upto date and farmers were able to obtain better price for the produce based on the price information received by them on mobile.

Table 16: Perception about Market price information received from various sources (%)

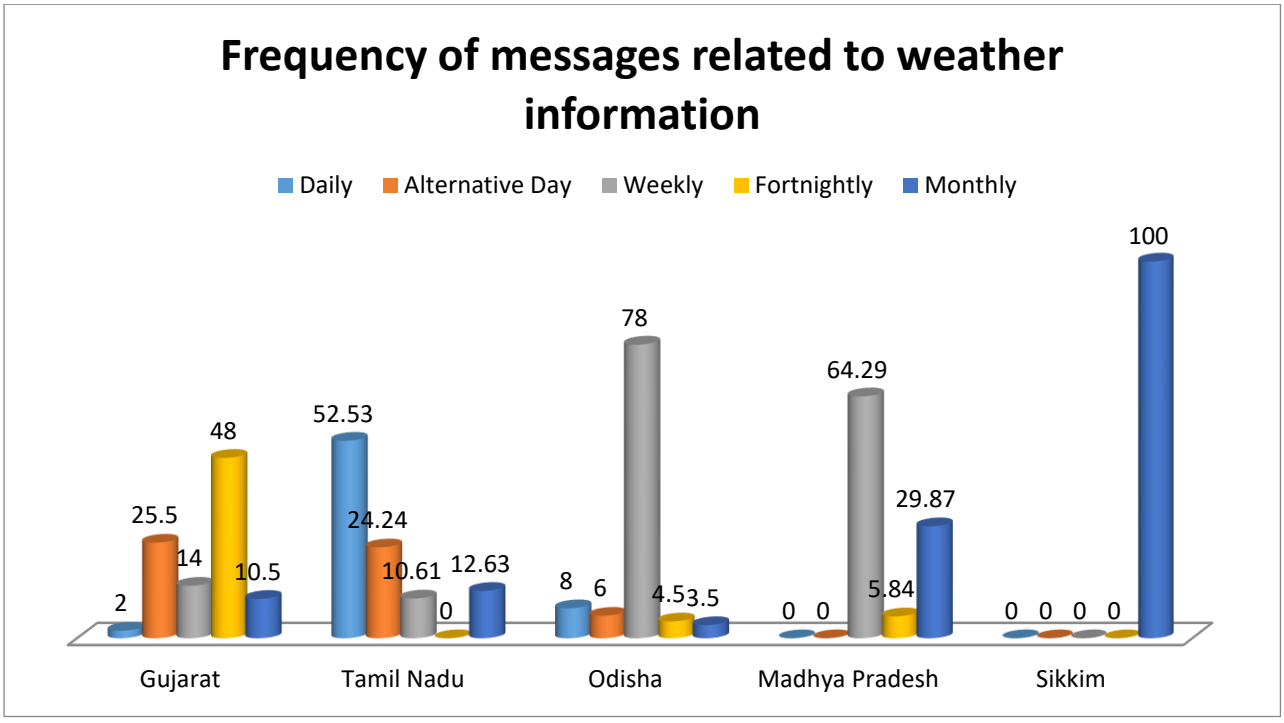
State Name	Excellent	Very Good	Good	Average	Poor
Gujarat	4.57	29.95	44.67	9.64	11.17
Tamil Nadu	3.09	9.28	31.96	34.54	21.13
Odisha	0.64	15.38	74.36	9.62	0.00
Madhya Pradesh	0.00	1.83	4.59	79.82	13.76
Sikkim	0.00	21.00	71.00	8.00	0.00
Grand Total	**1.87**	**16.94**	**48.25**	**23.83**	**9.11**

Table 16 shows that only 48.25 per cent farmers expressed that the market price information was good while in the case of Madhya Pradesh majority (79.82 %) of the farmers reported that market information was average. The number of farmers was very low (only 1.87 %) in the category of excellent, so it is suggested that the

messages on market price information need to be improved and updated according to market.

Table 17: Frequency of messages related to weather information (%)

State Name	Daily	Alternative Day	Weekly	Fortnightly	Monthly
Gujarat	2.00	25.50	14.00	48.00	10.50
Tamil Nadu	52.53	24.24	10.61	0.00	12.63
Odisha	8.00	6.00	78.00	4.50	3.50
Madhya Pradesh	0.00	0.00	64.29	5.84	29.87
Sikkim	0.00	0.00	0.00	0.00	100.00
Grand Total	**13.03**	**11.66**	**31.93**	**11.97**	**31.41**

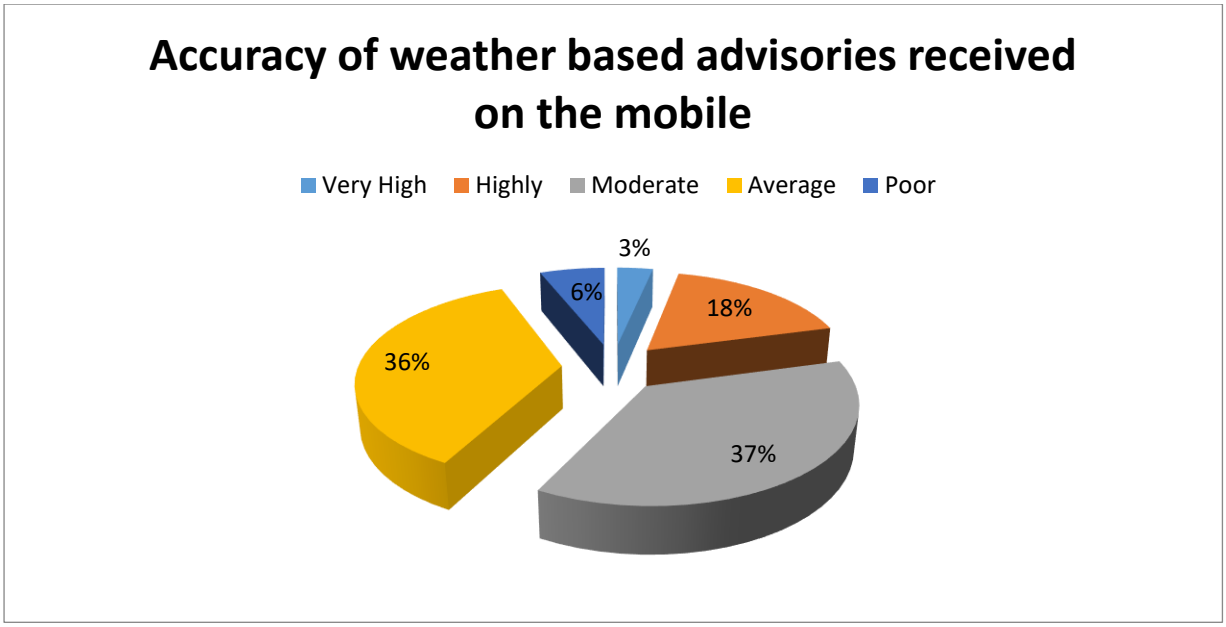


Graph 12: Frequency of messages related to weather information (%)

Table 17 shows that 52.53 percent of farmers received message related to weather information daily while only 25.50 per cent farmers of Gujarat received message related to weather information on alternate days. 78.00 percent of farmers of Odisha received the message weekly and 48.00 per cent of Gujarat farmers received message fortnightly. Cent per cent of Sikkim farmers received monthly message related to weather information. It is very well known that weather forecasts for a long term are not useful, frequency of weather information should be at least alternative days. Accuracy, frequency and utility of forecasts would be good for management of agricultural practices.

Table 18: Accuracy of weather based advisories received on the mobile (%)

State Name	Very High	Highly	Moderate	Average	Poor
Gujarat	0.50	21.50	43.50	27.00	7.50
Tamil Nadu	15.74	14.21	16.75	34.52	18.78
Odisha	0.00	45.00	43.50	11.50	0.00
Madhya Pradesh	0.00	1.91	11.46	82.80	3.82
Sikkim	0.00	1.50	63.00	35.50	0.00
Grand Total	**3.35**	**17.51**	**36.79**	**36.27**	**6.08**



Graph 13: Accuracy of weather based advisories received on the mobile (%)

Maximum number of farmers said that accuracy of weather based advisories received on the mobile was moderate and average. This shows that there is a scope to improve the message content related to weather based advisories.

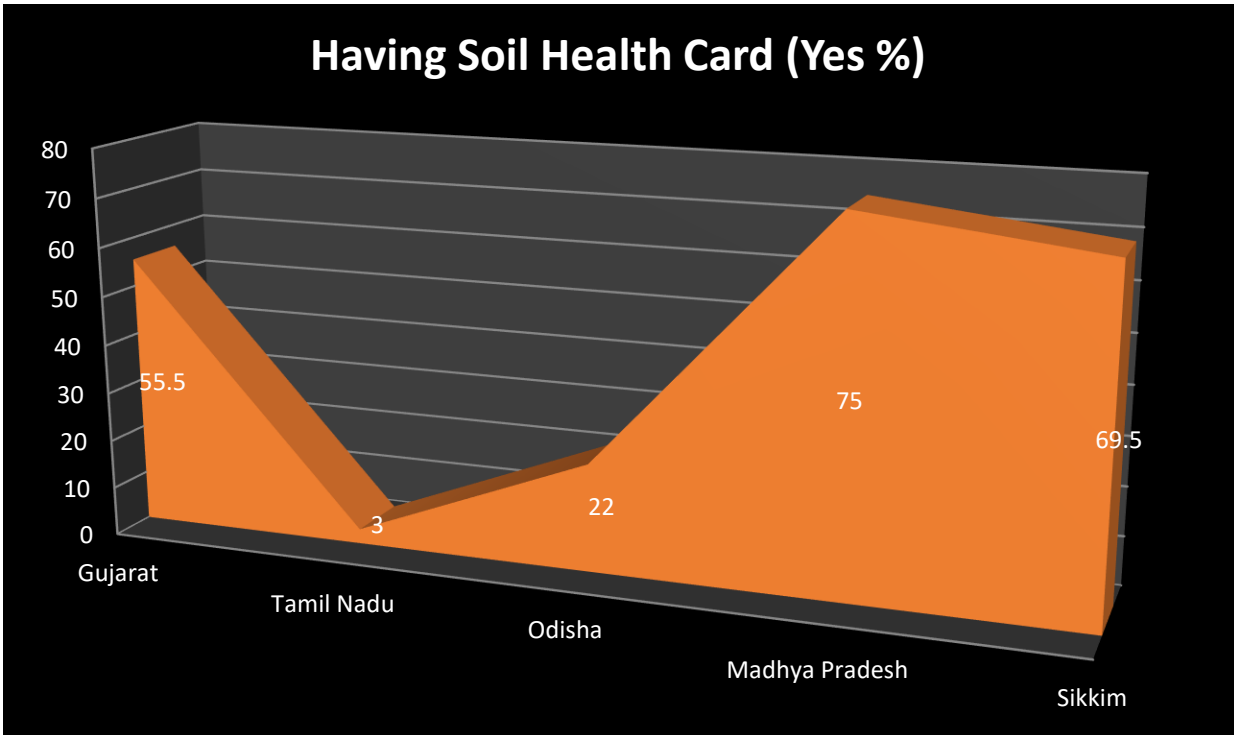
Table 19: Perception about weather advisories received on your mobile (%)

State Name	Excellent	Very Good	Good	Average	Poor
Gujarat	5.50	22.00	44.50	23.50	4.50
Tamil Nadu	12.56	10.55	25.63	31.66	19.60
Odisha	0.00	25.76	70.71	3.03	0.51
Madhya Pradesh	0.00	1.95	6.49	87.66	3.90
Sikkim	0.00	4.50	68.50	26.50	0.50
Grand Total	**3.79**	**13.46**	**44.90**	**31.97**	**5.89**

In agriculture environment, relevant and timely information helps the farming community to take the right decision for sustained growth of agriculture activity. Majority of farmers perceived that weather advisories received on mobile were good and average.

Table 20: Soil Health Card (Yes(%)

State Name	Having Soil Health Card	Are you able to follow the recommendations given in the Soil Health Card	Are you receiving SMS on recommendations to be followed based on Soil Health Card
Gujarat	55.50	29.50	18.50
Tamil Nadu	3.00	2.50	2.50
Odisha	22.00	18.18	9.00
Madhya Pradesh	75.00	59.60	69.35
Sikkim	69.50	60.50	6.50
Grand Total	**45.00**	**34.04**	**21.12**



Graph 14: Possession of Soil Health Card

In Madhya Pradesh state, majority of the farmers have soil health card, follow the recommendations given in the soil health card and are receiving SMS on recommendations to be followed based on Soil Health Card. In Sikkim and Gujarat more number of farmers had soil health card and follow the recommendations given in the soil health card but a less number are receiving SMS on recommendations to be followed based on Soil Health Card. In Tami Nadu only 3.00 per cent of the farmers are having soil card and of them 2.5 per cent farmers follow the recommendations given in the soil health card and are receiving SMS on recommendations to be followed based on Soil Health Card.

Table 21: Perception about Soil Health Card and recommendations based on soil testing (%)

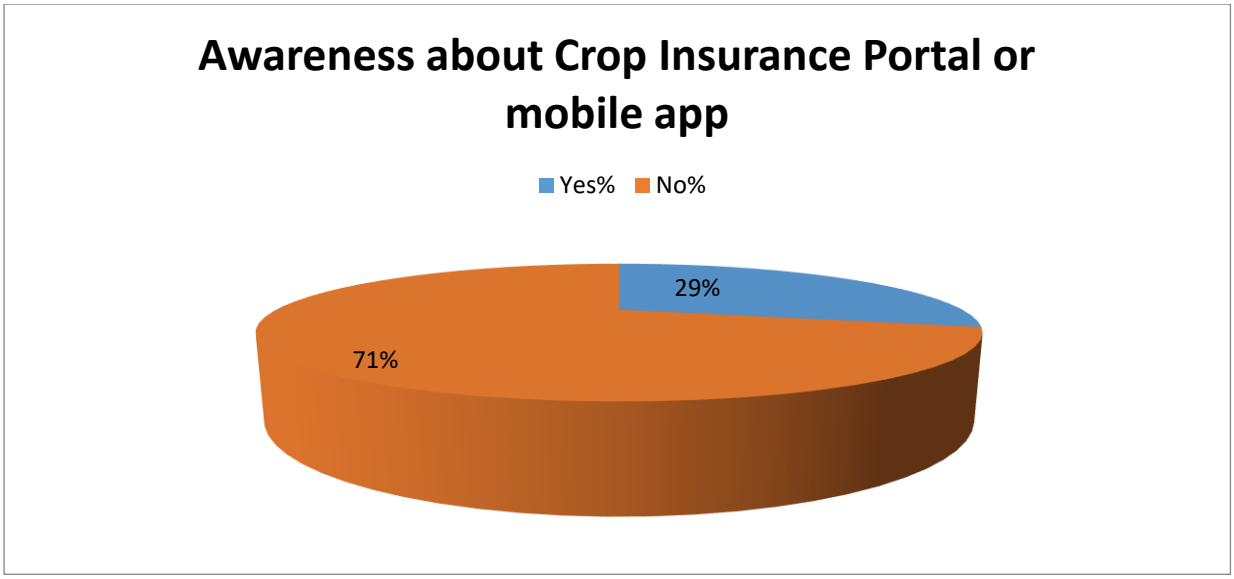
State Name	Excellent	Very Good	Good	Average	Poor
Gujarat	5.08	15.23	35.53	22.34	21.83
Tamil Nadu	1.03	9.23	31.79	38.97	18.97
Odisha	0.50	11.50	85.00	2.50	0.50

Madhya Pradesh	5.42	22.89	8.43	56.63	6.63
Sikkim	0.00	15.00	69.50	15.50	0.00
Grand Total	**2.30**	**14.51**	**47.49**	**26.10**	**9.60**

The above table shows that farmers Perception about Soil Health Card and recommendations based on soil testing was average in Madhya Pradesh while in other states maximum farmers reported that Soil Health Card and recommendations based on soil testing was good. Very few number of farmers said that Soil Health Card and recommendations based on soil testing was excellent.

Table 22: Awareness about Crop Insurance Portal or mobile app

State Name	Yes%	No%
Gujarat	31.00	69.00
Tamil Nadu	19.10	80.90
Odisha	23.00	77.00
Madhya Pradesh	71.36	28.64
Sikkim	1.50	98.50
Grand Total	**29.16**	**70.84**



Graph 15: Awareness about Crop Insurance Portal or mobile app

Indian Agriculture is highly susceptible to risks like droughts and floods. It is necessary to protect the farmers from natural calamities and ensure their credit eligibility for the next season. For this purpose, the Government of India introduced many agricultural schemes throughout the country. Crop Insurance Portal or mobile app is one of the initiatives of the government. Table 22 shows that 70.84 per cent farmers were not aware about the Crop Insurance Portal or mobile app. There is urgent need to improve awareness on portals and mobile app. In Madhya Pradesh, majority of farmers (71.36 %) were aware about Crop Insurance Portal or mobile app. This shows that in Madhya Pradesh that there is more awareness among farmers on the benefits of the crop insurance scheme. This could either be due to extreme natural calamities or because they think it is beneficial.

Table 23: Have you ever received any information related to Livestock/Fisheries/Irrigation or Drought Relief on your mobile

State Name	Yes%	No%
Gujarat	61.00	39.00
Tamil Nadu	15.38	84.62
Odisha	1.00	99.00

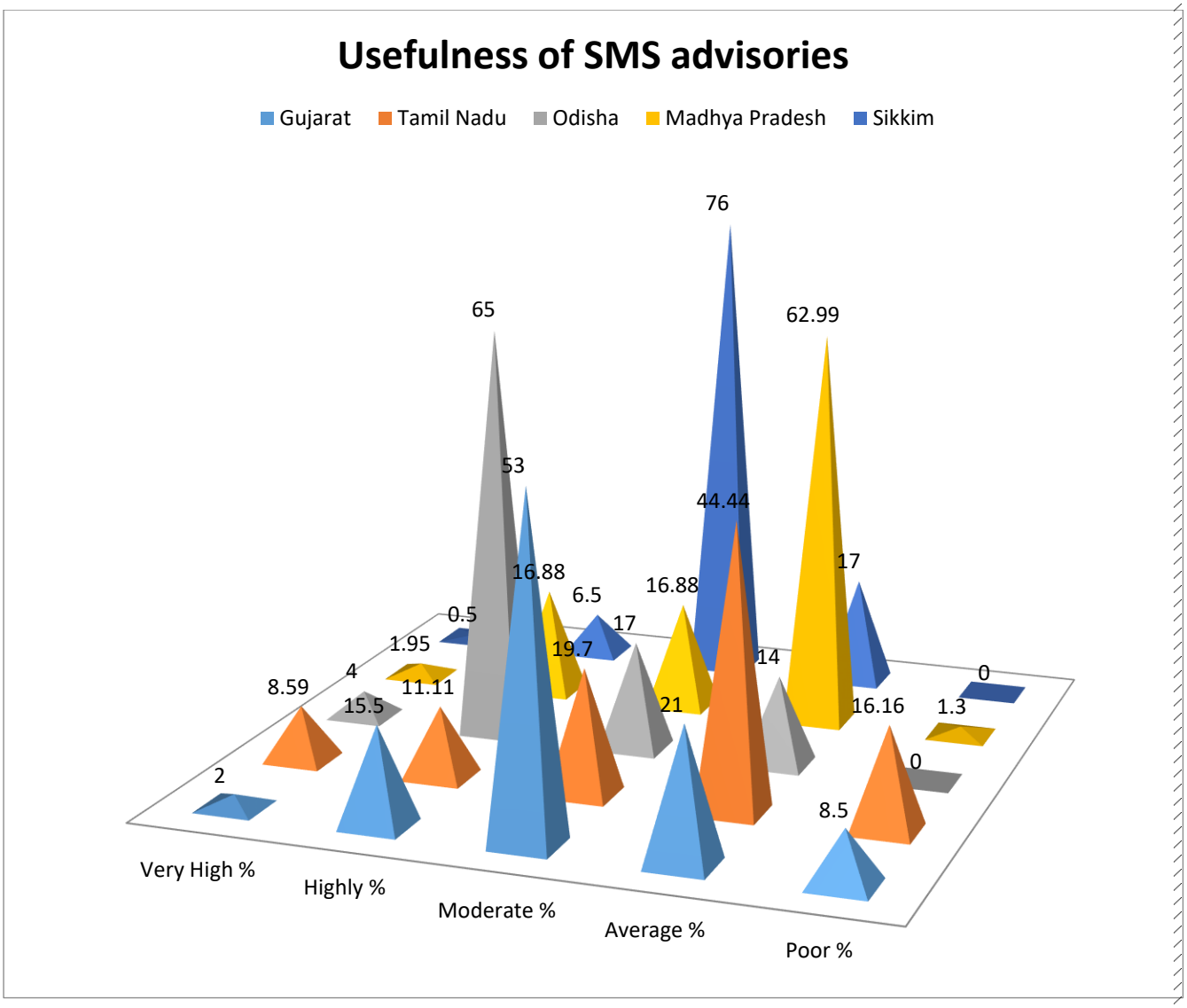
Madhya Pradesh	75.38	24.62
Sikkim	0.00	100.00
Grand Total	**30.58**	**69.42**

Table 23 revealed that almost 70 per cent of farmers never received any information related to Livestock/Fisheries/Irrigation or Drought Relief on their mobile. There is a need for a database on allied sectors of agriculture. Many District level officers also reported that there is a lack of a database on allied sectors of Agriculture.

Table 24: Usefulness of SMS advisories

State Name	Very High %	Highly %	Moderate %	Average %	Poor %
Gujarat	2.00	15.50	53.00	21.00	8.50
Tamil Nadu	8.59	11.11	19.70	44.44	16.16
Odisha	4.00	65.00	17.00	14.00	0.00
Madhya Pradesh	1.95	16.88	16.88	62.99	1.30
Sikkim	0.50	6.50	76.00	17.00	0.00
Grand Total	**3.47**	**23.32**	**37.50**	**30.36**	**5.36**

Table 24 shows that, 23.32 per cent farmers expressed that they found SMS advisories highly useful to them. Only 3.47 per cent farmers agreed that SMS service very highly useful to them. Farmers must be able to get information delivered to them at a time and place of their choosing and it will be beneficial to farmers to realize productivity gains from the adoption of new farming practices and actions to mitigate crop losses.



Graph 16: Usefulness of SMS advisories

Table 25: Have your productivity / profit / earnings improved after you started receiving SMS advisories

State Name	Excellent %	Very Good %	Good %	Average 5	Poor %
Gujarat	4.00	19.50	54.00	18.00	4.50
Tamil Nadu	13.64	10.61	24.75	35.35	15.66
Odisha	0.50	33.00	63.00	3.00	0.50
Madhya Pradesh	1.36	8.16	12.24	73.47	4.76

Sikkim	0.00	16.50	68.50	15.00	0.00
Grand Total	**4.02**	**18.10**	**46.35**	**26.46**	**5.08**

Majority of the farmers in the states of Gujarat, Sikkim and Odisha reported that productivity / profit / earnings improvement was Good after they started receiving SMS advisories, while in Madhya Pradesh State farmers said that it is average. From the above discussions it can be concluded that SMS advisories is a good initiative by Govt. but the connectivity and awareness in the rural area is problematic.

Table 26: Whether you have recommended other farmers also to register for SMS advisories

State Name	Yes%	No%
Gujarat	79.40	20.60
Tamil Nadu	26.53	73.47
Odisha	84.50	15.50
Madhya Pradesh	81.68	18.32
Sikkim	59.00	41.00
Grand Total	**66.23**	**33.77**

Table 26 shows that almost 66 per cent of farmers expressed that they recommended other farmers also to register for SMS advisories. Only in Tamil Nadu, majority (73.47%) of farmers said that they have not recommended other farmers to register for SMS advisories. As previously indicated in officer's perception section, it is already mentioned that awareness about mobile app was very low among farmers. In areas where farmer-to-farmer communication channels are preferred, access to information related to agricultural will facilitate the effective dissemination of information amongst a greater number of farmers. To increase farmer's registration

for SMS advisories, there is need to increase the reliability and validity of SMS advisories services.

Farmer-to-farmer communication is not the only communication channel for the dissemination of the information, but it is preferred by farmers who only speak local languages. Thus, to enhance the rate of dissemination of information, farmer-to-farmer communication channels should be utilized to complement the use of other channels of dissemination for registration of advisories messages.

Table 27: In case you are required to pay some nominal amount for receiving the SMS service would you like pay the same

State Name	Yes%	No%
Gujarat	48.99	51.01
Tamil Nadu	11.17	88.83
Odisha	2.53	97.47
Madhya Pradesh	81.87	18.13
Sikkim	4.00	96.00
Grand Total	**29.41**	**70.59**

As per TRAI data of May, 2014, though there are about 38 crore mobile telephone connections in rural areas, internet penetration in the countryside is still abysmally low (in single digit percentage). Therefore, mobile messaging is the most effective tool so far having pervasive outreach to nearly 8.93 crore farm families. Table 27 reveals that majority of farmers (70.59) farmers have not agreed to pay some nominal amount for receiving the SMS service. However it is interesting to note in table 27 that more than 80 per cent of Madhya Pradesh farmers and 48.99 percent of Gujarat farmers agreed to pay some nominal amount for SMS advisories.

Table 28: Whether information on all the services required by you are covered in the messages received by you

State Name	Yes%	No%
Gujarat	75.88	24.12
Tamil Nadu	32.49	67.51
Odisha	86.00	14.00
Madhya Pradesh	94.76	5.24
Sikkim	50.00	50.00
Grand Total	**67.68**	**32.32**

Table 28 shows that 67.68 percent farmers agreed that messages received by them covered all required areas, but a perusal of table also revealed that 67.51 per cent of Tamil Nadu farmers expressed that the advisories received by them did not cover all required areas. In the previous table 26, more than 70 per cent of farmers said that they have not recommended other farmers to register for SMS advisories. To increase trustworthiness of advisories messages, message content should be on the basis of farmer needs and expectations.

Table 29: Have you heard of any Mobile App for Agriculture

State Name	Yes%	No%
Gujarat	36.50	63.50
Tamil Nadu	6.53	93.47
Odisha	5.03	94.97
Madhya Pradesh	72.36	27.64
Sikkim	1.50	98.50
Grand Total	**24.37**	**75.63**

Table 29 shows that 75.63 percent of farmers had never heard about mobile app for agriculture. Awareness about apps is very low and district officers of NeGP-A also suggested that awareness about mobile apps needs to be increased. Compared to SMS advisories, Mobile apps are more beneficial because most of the mobile phones do not support local language. Majority of farmers do not understand English. Content length for every SMS is limited to 120 characters for English and only 50 characters or 7-10 words for local languages. If the content is more, then the content is broken into multiple SMSs, which may be delivered out of sequence *i.e.* second part of SMS may reach first, and vise-versa. The content effectively loses the meaning. SMS delivery is also not reliable. 20% of SMS do not reach the end users for various reasons. Due to of tele-marketers, users get lots of SMS (SPAM) and in this process they miss important messages or don't bother to read each message.

Table 30: Knowledge about other Mobile Apps

State Name	Kisan Suvidha	Crop Insurance	Bhuvan Hail Storm	Agri Market	Pusa Krishi	Other, specify
Gujarat	30.50	14.00	0.50	21.00	0.50	7.00
Tamil Nadu	3.02	3.52	0.00	0.50	0.00	0.50
Odisha	3.52	5.03	1.01	3.02	0.50	0.00
Madhya Pradesh	35.03	7.61	0.51	7.61	0.00	42.64
Sikkim	0.00	1.50	0.00	1.00	0.00	0.00
Grand Total	**14.37**	**6.33**	**0.40**	**6.63**	**0.20**	**9.95**

With a pickup in Internet usage and increase in smart phone penetration in rural areas, farmers have been able to make use of the Internet to research on farming solutions. The government has introduced mobile applications for farmers that provide real-time data about weather, local markets, seeds, fertilizers among other things. In addition, farmers can also interact and get guidance from agriculture experts across

the country via the apps. Table 30 shows that knowledge about mobile apps was very low in among the farmers. Mobile apps are very useful for farmers but awareness about apps is very low in the country. Knowledge is key to decision making and timely advice can help plan better and manage the risk better and manage the risk appropriately.

Table 31: Have the Mobile Apps been found to be useful for you

State Name	Yes%	No%
Gujarat	31.16	68.84
Tamil Nadu	19.29	80.71
Odisha	58.50	41.50
Madhya Pradesh	51.26	48.74
Sikkim	17.00	83.00
Grand Total	**35.48**	**64.52**

The discussion of the previous two tables shows that the awareness and knowledge about mobile app is very low in the rural areas and this is the reason why most of farmers expressed that mobile apps were not useful for them. Internet connectivity is also a problem for mobile apps and the literacy rate of farmers may also be a reason for non-adoption of mobile app.

Villagers comprise the core of Indian society and also represent the real India. Mobile has no doubt affected the lives of rural people. As far as agriculture is concerned, these have provided many opportunities to the farmers, and it is for these villagers that mobile app networks must realize their power as well as responsibility towards rural development. It would be helpful to ease the process of selling the crop through online schemes which will result in elimination of middlemen. In order to accelerate rural growth, it is essential that we learn new ways of integrating social and human infrastructure development into the installation of basic information and communications infrastructure.

Recommendations:

Decentralized Instructions:

National e-Governance Plan in Agriculture is very important as it is the need of the hour to reach out large number of farmers. Farmers should be able to get relevant local information required for them for growing crops, marketing, value addition, etc. Since agriculture is highly specific to the local agro-climatic situation, State Governments should play very important role in providing this kind of information to the farmers. A State-specific e-Governance strategy needs to be developed based on the local situation. The State portals should be developed in quality manner giving relevant information specifically to the block/districts. Farmers should be given information regarding list of inputs shops, markets, godowns and other stores facilities available nearer to them. This kind of relevant local information is more useful to the farmers. The State portals should be updated on daily basis giving even market rates and trends, etc. The state should play very crucial and active role for giving the dynamic information.

Right now the farmers' portal is giving lot of knowledge like package of practices of various crops, etc. However, the knowledge should be given only to the extent required by the farmers for a particular crop and region and knowledge should be local language more specifically using local words farmer are familiar with. This can be effectively done only through State portals. Central M-kisan portal should link all State portals apart from giving National perspective of farmers' policies, schemes and also on international trends in Agricultural commodity prices.

The role of Govt. of India should be more into the capacity building of State Government officials in maintaining these portals in farmers' friendly manner. The extension officials should be able to popularize the local State portals so that all farmers can get relevant information by visiting Common Service Centers of IT Department or even Private internet Centers.

Local Content Rich SMS Services:

It is observed that the telephone Nos. of the farmers once entered are not updated. With the result, large number of SMSs are not reaching the targeted farmers. Unless the State extension system internalizes this, regular updating is not possible. Right now the SMS is given by an Extension worker but payment is made at National level. This kind of system makes less involvement of Extension worker to design relevant local messages. Instead of this system, Govt. of India can allot budget to State Governments for sending SMSs to farmers and in turn it can be allotted to various departments/districts, and within the budget available, the local extension officials and KVKs can formulate SMSs required for that season and send only to the relevant farmers. The ownership of State Government on SMS will improve if payments are also made at State/district levels. This will also build the capacity of extension personnel to see various websites, weather forecast, markets, data, etc. to send relevant content. For this purpose, a kind of Coordination Committee is required at district to see the quality of the content. The same Committee can look into the e-Governance aspects in agriculture like whether extension officers are promoting WhatsApp groups, Facebook apart from providing e-Governance services for providing agri-machinery on subsidy, seed subsidy, etc. so that there is overall improvement in provision of farmer services, better of targeting of Center and State level schemes apart from bringing out transparency and effectiveness. Ultimately, the objective of the National e-Governance Plan is to take e-Governance Services to the door step of farmers for better agriculture through better quality of services.

Capacity Building:

SAMETI should take up capacity building programmes in incentive manner for all the extension workers popularizing e-Governance initiation for better extension and advisory services. MANAGE can conduct ToT training programmes to SAMETI faculty as well as to State Project Management Units. A National workshop once or twice in a year giving the overall objectives of 'e-Governance' for the Agriculture to the Policy makers is to be conducted so that there is a holistic view about e-Governance in Agriculture with the State Governments.

National Focus:

The Govt. of India should monitor whether the budgets given under National e-Governance are properly utilized and must ensure that the equipment, required infrastructure are at place. While implementing National e-Governance Plan, convergence with Private players especially in sending SMSs is also required as there are many Private players and NGOs are also sending this kind of messages. To have a common understanding and optimization of resources, this e-Governance Plans can be worked out in district level.

In some States, farmer friends are provided with Tablet and internet. This is very effective in reaching out large number of farmers of villages wherein all farmers do not have access to the individual internet facility.

Apps

No. of useful Apps are available for farmers which are developed by DAC&FW, for example Kisan Suvidha App. Extension officials should popularize these Apps and the content once again needs to be developed at local level giving only locally relevant information.