E-AGRICULTURE AND E-TECHNOLOGY IN AGRICULTURE

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ABSTRACT

Agriculture is the prime source of income for farmers where in India more than half of the population resides on agriculture and their livelihood depends on it. Before few years, agriculture practices is a traditional approach where humans or manpower plays the main role and uses an outdated approach to farming but nowadays, e-Agriculture has been introduced which changes the complete scenario of farming. E-agriculture is a combination of traditional mechanism of farming with the role of Information, Communication and Technology in Agriculture which leads to smart farming/precision farming. This will include the basic importance of ICT in agriculture and changes that leads to the enhancement of farming and provides innovative and progressive techniques of farming to all the farmers.

Keywords: e-Agriculture, Role of IT in Agriculture, Use of ICT in Agriculture.

I.   INTRODUCTION

The term e-agriculture stands for electronic agriculture which emphasises on including and emerging the new ideas of technology in the field of agriculture. As agriculture is a basic and a year back procedure where traditional methods were used from sowing to threshing in agriculture. Nowadays, with the help of several technologies in the field of agriculture which made it so easy and effective process with the best utilization of natural and human resources effectively. It also provides a platform where people from different parts of the world can exchange their ideas and their new invention in the field of agriculture. E-Agriculture made the life and style of farming so convenient for the farmer's point of view. E-Agriculture is not an individual effort, it's a combination of farmers who produce the basic commodities by doing farming and the technology which his farming easy and effective. Thus, it's all about sharing your knowledge, experience and innovative ideas between different parties such as farmers, IT professionals, private organizations, government organizations. NGOs working in favor of farmers and agriculture and many other departments or organization.

II.   ECOSYSTEMS OF E-AGRICULTURE

The Ecosystem of e-Agriculture is nowadays becoming a very broad area in terms of people or organizations working together for making a huge success of technology in the field of agriculture. Ecosystem of e-Agriculture consists of all the people, organizations, department, NGOs working in favor of agriculture of which directly and indirectly involved in agriculture through which agriculture activity work fluently.

1. Connection with the government and many multinational organizations for the support of government scheme in the benefit of farmers and agriculture to improve their livelihood and insurance of their crops in case of damage and other several issues.

2. Support from banks, national, international and gramin banks and other financial institution for providing the funds for agriculture as and when needed, ease of agricultural loans and providing subsidies to farmers.

3. Connection with e-mandi's, Krishi-mandi, direct connection with suppliers, retailers, wholesalers, connection with intermediates, vendors and commodity market to sell their products at the reasonable and best price

4. Support from Agricultural Universities, Research centers and other Agriculture Extension bodies working in the field of agriculture to generate new ideas and evolution in the field of agriculture to strengthen the technical and mechanical support in farming.

5. Helps from Agriculture scientist of various field agronomy, soil science, horticulture, plant breeding, plant

protection, extension and many others specialization in their fields. The experience of these scientists can be used in favor of farmers as and when problems arise in their field.
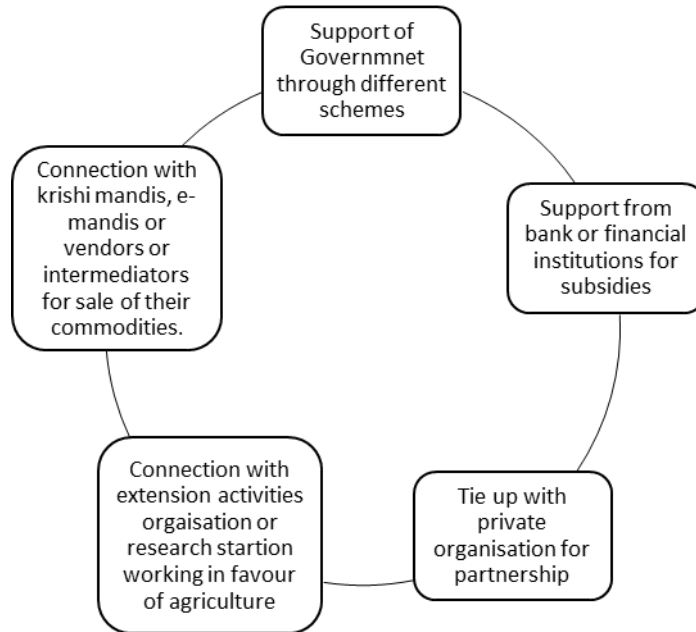

Figure 1: Ecosystem of E-Agriculture

III. ICT

ICT acronym for Information and Communication Technology in agriculture is also known as e-Agriculture. ICT focuses on the improvement and enhancement of the technology in the field of agriculture in such a way that it reduces the burden of work of multiple manpower, reduces the risk, improves the productivity and increases the income of farmers and their livelihood. Thus, ICT not only changes the previous or traditional style of farming but also given a new concept, different ways of thinking and improvement in their skills to produce more output with the same given input with fewer expenses.

IV.   WIRELESS TECHNOLOGY

GPS

GPS acronym Global Positioning System and also known as Geographic Positioning System. GPS provides many benefits in the field of agriculture without the help of experts or professionals, farmers can locate or find the location of their machinery, animals and their working staff. It helps in geo-fencing which helps in finding the location of animals crossing the fencing or not in a particular area. It also helps in generating maps and surveying. It also helps in precision agriculture. (see figure 2)
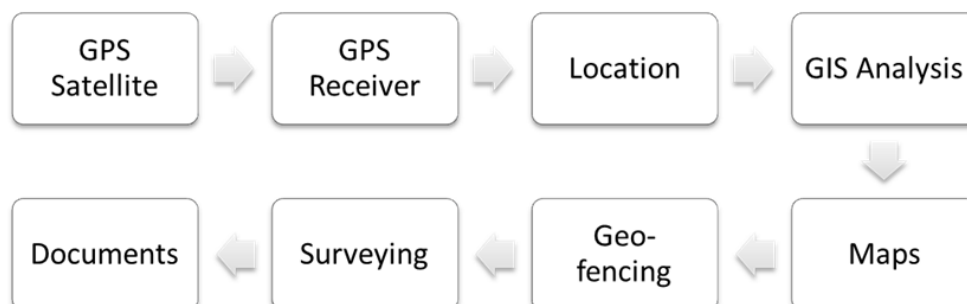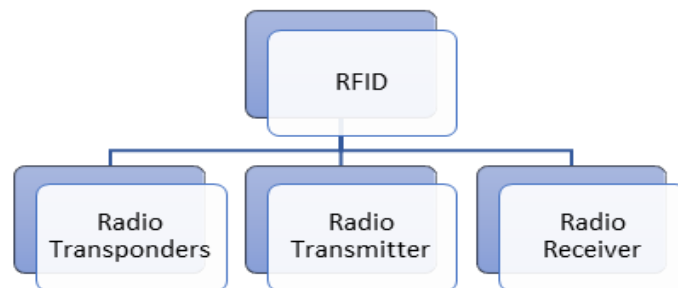

Figure 2: GPS (Global Positioning System)

GIS

GIS acronym Geographic Information System. GPS is a system or mechanism which helps in agriculture and more precisely in precision agriculture in providing the geographic structure. It helps in providing various types of information such as soil quality, texture, types of soil, land quality, previous pattern of framing in particular areas etc. through which decision-making becomes easy for farmers. They can choose wisely the land portion over which they can increase their productivity by knowing the geographic information in advance. It uses space and time as the main index value and generates geographic information for farmers and others.

RFID

RFID acronym for Radio Frequency Identification. It plays the main role in animal identification management. RFID. It is a device that can be attached to any object for its tracking or movement in observance. It can also use for animals by attaching this RFID to animal's bodies (in ears or legs) to monitor their health condition and performance logs on daily basis. It also provides the enhancement in controlling the various types of diseases in animals or livestock.

GST

GST acronym for Geo-Spatial Technology. It is the combination of Global Positioning System (GPS), Geographic Information System (GIS) and Remote Sensing (RS). All this technology is used in geo-spatial technologies whose major work is collecting, store, analyzing and interpret ate the data as and when needed. Geo-spatial technology only depends on data that is correctly fed, if in case the data collected is wrong then in that case, it will present or give a wrong output which may lead to the wrong decision at the end. It is helpful in collecting different types of information such as Soil types, pH rates, Pest infestation, Nutrient availability, Soil moisture content, Fertility requirements, Weather predictions, Crop characteristics and Hybrid responses. Geo-spatial technology allows capturing the data as per from satellite that captures data from earth and using that data for getting different sort of information, modeling, simulation, analysis and visualization. These data collected is in form of time and space as two major vectors. Geo-spatial technologies play a vital role in the field of agriculture by increasing yields/output, managing and efficient usage of resources, prediction of outcomes and improving farm practices.

Agricultural Drone

Agricultural Drone is also a wireless technology which helped agriculture in a very positive manner. Agriculture drone is an aerial vehicle that is controlled a remote sensing device to control his arm/rotate movement in different directions. This device helps farmers to keep eye on their field and their workers while sitting far away from their field. Agriculture drone helps to improve and achieve the precision farming. The Drone is having a sensor ability and capturing an image as camera ability thorough which it can take the pictures and can be viewed by professional of farmers. even it helps to view the land and soil quality in depth. This mechanism of farming management is based on observing, measuring, and taking action based on real-time crop and livestock data. It removes the need for traditional work in modern farming and instead gives farmers the ability to maximize their production and run more efficient organizations with enhancing crop yield. Different varieties of drones are available in the market few of which can carry and do spray to crop of different insecticides and pesticides as they can carry 5-25 kg of weight. The Drone is also helpful in knowing and monitoring the crop health

and managing livestock and monitoring their health conditions.

V.   EXPERT SYSTEM IN AGRICULTURE

If Expert System in the field of Agriculture provides a major role as agriculture is a complex and mixed structure which depends on various factors such as climatic conditions, soil quality, weather forecasting, water resources, land depletion, types of soils available, manpower required, quality of seeds etc.

There are different types of expertise at different level exist whose major criteria is to solve the problems as when needed, to increase the productivity, to increase the income and profit and reduce the risk. This system is broadly divided into Decision Support System (DSS), Soil Information System (SIS), Expert System (ES), Knowledge-based System (KBS) and many others.

DSS

Decision Support System (DSS) is a computer/software-based application whose main role is to collect, store and analyze the data as and when needed by higher authorities for their decision-making process. By collecting the data here means maintaining the information or maintaining the historical data. So, when the requirements arrive at a higher/any level my analyzing that previously stored data that can be compiled in the shorter form will be helpful in making fast, efficient and good decisions. it also saves manpower and time. (see figure 3)
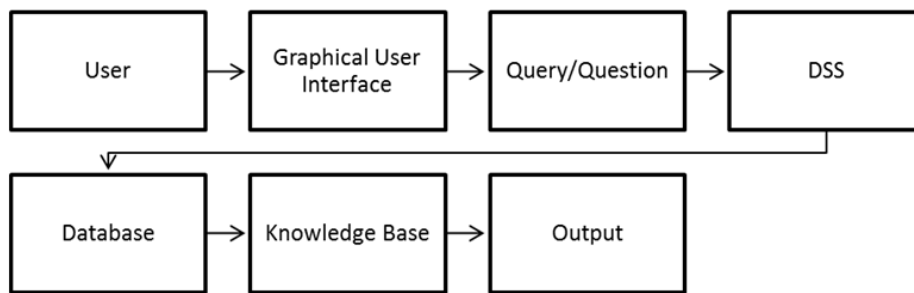

**Figure 3:** DSS (Decision Support System)

SIS

Soil Information System (SIS) is a system that uses well advance and hi-tech remote sensors, intelligent devices, and geospatial technologies and to produce high-quality images with high resolution and complete information of land (topographical information). As it provides complete information and understanding of the physical and logical characteristics of soil which makes the decision-making process easier for farmers and other organizations to implement more effective solutions to resolve the challenges in the field of agriculture. (refer table 1)

Soil Information System	Parameters influencing crop performance
Climate	
Rainfall Temperature	Available moisture
Topography and landscape	Resistance to erosion and loss of plant nutrients
Slope	Landscape position –availability of moisture
Physical condition(s) of soil	
Texture	Water availability and soil structure
Depth	Available space for root development
Groundwater table	Landscape position – availability of moisture
Soil Fertility	
PH (soil reaction)	Availability of plant nutrients

Silt and clay content	Availability of moisture and plant nutrients
Base Saturation	Soil health and structure/availability of plant nutrients organic matter

Different types of soils are as follows: -

➤ Black Soils

➤ Red Soils

➤ Laterite Soils

➤ Desert Soils

➤ Alluvial Soils

➤ Black Soils

➤ Mountain Soils

➤ Saline and Alkaline Soils

➤ Peaty and Marshy Soils
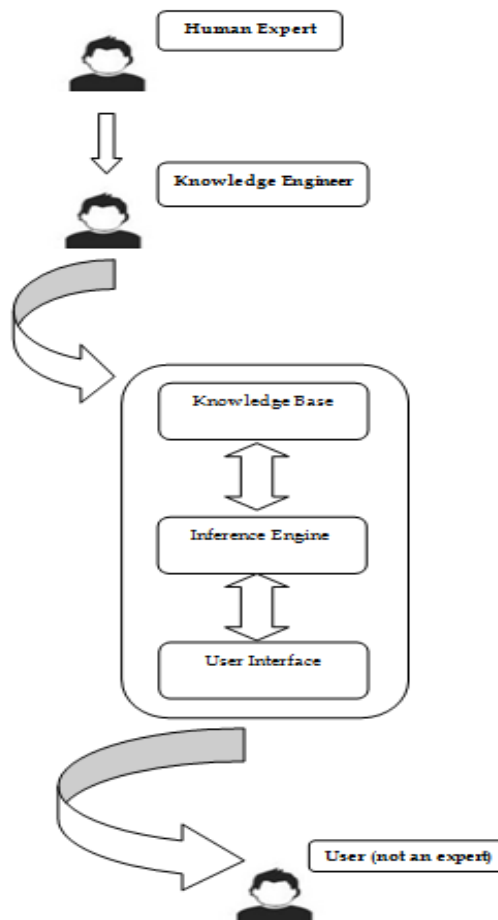
Soil Type	θ_s	ψ	K_s (x10^{-6}ms^{-1})	b	θ_w^*
Sand	0.395	−0.121	176.0	4.05	0.0700
Loamy Sand	4.410	−0.090	156.3	4.38	0.0750
Sandy Loam	0.435	−0.218	34.1	4.90	0.1142
Silt Loam	0.485	−0.786	7.2	5.30	0.1794
Loam	0.451	−0.478	7.0	5.39	0.1547
Sandy Clay Loam	0.420	−0.299	6.3	7.12	0.1749
Silty Clay Loam	0.477	−0.356	1.7	7.75	0.2181
Clay Loam	0.476	−0.630	2.5	8.52	0.2498
Sandy Loam	0.426	−0.153	2.2	10.40	0.2193
Silty Clay	0.492	−0.490	1.0	10.40	0.2832
Clay	0.482	−0.405	1.3	11.40	0.2864

* Volumetric soil water content at wilting point

Soil texture quality means the mixture of sand, clay and silt practices make the different quality of soil and that can be evaluated and retrieved by the Soil information system. (see figure 4)
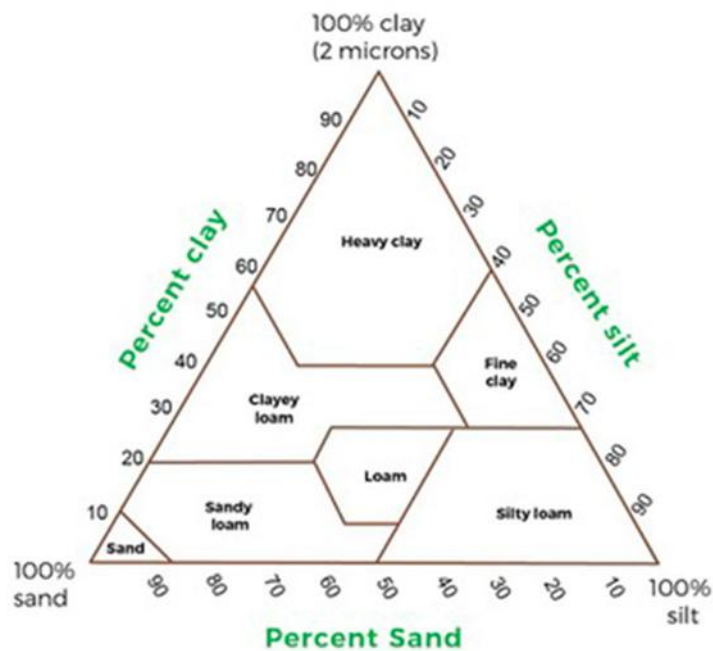

Figure 4: Soil Texture

VI.   MOBILE APPLICATION IN AGRICULTURE

There are several mobile applications are also working which gives information and solution in the field of agriculture. these applications also provide the latest information about their climatic conditions, new technologies and equipment, disease and crop management. In this digital era, where technology plays an immense role in the advancement and leads to a wide improvement in agriculture. This led to the development of various mobile applications also through which various information about agriculture and farming can reach farmers instantly in rural areas. It provides a feature of WYSIWYG (What You See Is What You Get) just on one click

which gives an ease of access to the mobile application on smartphones. A few of agricultural mobile applications are as follows: -

IFFCO KISAN

IFFCO KISAN Agriculture App is a mobile application that gives various information like weather specifying rain, humidity, wind as per your location which was selected by the farmers including his State and District. It also provides ease buyer and seller details through which farmers can get the details and information of buyer and seller of the commodity through which they can sale and purchase their commodity. It also provides Agri-Services which gives important information about the farming which is important as per time and situation. It provides an option for Ask an Expert option in which farmers can ask their queries anytime to the agricultural experts and get their precious advice free of cost. This application also has a financial service option which includes an Insurance and loan option. Here Insurance means farmers can insure their crops for certainty and reduce the risk of failure and loan means they can get information about the loan provided by different financial institutions. It also provides the latest news and jobs related to agriculture which is publishing in a newspaper or anywhere in media which includes various schemes announced by the government in support of farmers. This mobile application is available for both operating systems, Android and iPhone. Farmers and other seekers can download this application from the following link

For Android (from Play Store):-

https://play.google.com/store/apps/details?id=com.IFFCOKisan&hl=en_IN&gl=US

For iPhone (from App Store): -

https://apps.apple.com/in/app/iffco-kisan/id1076226587

This mobile application is built-in multilingual support. It supports 11 languages through which farmers from different states can use this application and get information in their state language. This application supports English, Punjabi, Malayalam, Bengali, Odia, Marathi, Kanad, Telegu, Tamil, Gujrati and Hindi. For using this application, the first and foremost step is to register on this application by your phone number and your name and then you have to select your location to get the information as per your zone. Thus, this application provides quality information timely and relevant to farmers. It provides informed decisions making by farmers which could lead to reduction in costs, increase in income, improve the opportunities for their livelihoods and job opportunities and transformation to work with linked with institutions for changing rural India.

PM KISAN

PM KISAN mobile application acronym for "Pradhan Mantri KIsan SAmman Nidhi" which was launched by The Government of India in order to strengthen the income of the Small and Marginal Farmers (SMFs). The scheme was launched in February 2019. It is being implemented by the Department of Agriculture, Co-operation & Farmers Welfare (DAC&FW) under the Ministry of Agriculture & Farmers Welfare through the Department of Agriculture of all the States and Union Territories Governments. This application is designed and developed by National Informatics Center (NIC), Ministry of Electronics and Information Technology, Government of India (GOI). This scheme aims to support the financial needs of SMFs in procuring various inputs to ensure proper crop health. This will also protect the farmers from falling into trap of moneylenders and their heavy interest charged on moneylenders amount and ensure their continuation in the farming activities. Under the Scheme, direct payment of Rs. 6000 per year will be transferred in three equal installments of Rs. 2000 each in every four months into the bank accounts of eligible landholding families. The eligibility criteria is that the Small and Marginal Farmers (SMFs) landholders farmer family comprises of husband, wife and children whose collectively own cultivable /agricultural land up to 2 hectares as per land records of any concerned state/Union Territory.

Using the Mobile app, farmers can do the following things: -

1. New farmer can register themselves

2. Can check the status of filled application

3. Edit their Aadhar card details by changing their name.

4. Know the basic information about the scheme

5. Dial Helpline number

This mobile application is built-in multilingual support. It supports 08 languages through which farmers from different states can use this application and get information in their state language. This application supports English, Hindi, Malayalam, Marathi, Tamil, Gujrati, Khasi and Garo. Farmers and other seekers can download this application from the following link

For Android (from Play Store) :-

https://play.google.com/store/apps/details?id=com.nic.project.pmkisan&hl=en_IN&gl=US

Krish-e

Krish-e is a mobile application that provides an advisory of multiple crops. It provides a personalized calendar for your farm which ask for your location, based on your crop selection, an area under cultivation, soil types - heavy and medium soil, farm location, sowing date, crop duration and various other parameters which gives an accurate scientific calendar that suited for farmers and their crops.

1. All activities from pre-sowing, land preparation, seed treatment, germination and growth, sowing, crop planning, silking and tasseling, fertilizer management, irrigation, maturity and harvest, integrated nutrient management, protection from pests, diseases, weeds, crop growth and harvest are covered in this advisory.

2. The application also provides the farmers exact dosage and the approximate cost of the required fertilizer.

3. The advisory is available in your multi-languages also along with images and videos for each activity.

4. Krish-e Nidaan is also provided by sharing an image or by writing a query in the text message format. The personalized advisory service is provided free of cost.

A few of Premium Services are as follows: -

1. Free soil testing is conducted and a soil health card is provided to farmers.

2. Pest, fertilizers and disease control measures are also provided.

3. Free advice/sessions are also provided by agricultural experts for instant and dynamic solutions.

4. Provide the dynamic weather condition as per according to the farmer's field and keep updating the data.

Currently, advisory services are available for Sugarcane, Wheat, Potato, Maize, Chilli, Paddy crop across various states.

This mobile application is built-in multilingual support. It supports 08 languages through which farmers from different states can use this application and get information in their state language. This application supports English, Hindi, Marathi, Telugu, Kannada, Tamil, Gujarati and Punjabi. Farmers and other seekers can download this application from the following link

For Android (from Play Store) :-

https://play.google.com/store/apps/details?id=com.myagriguru&hl=en

Krishi Network

Krishi Network Agricultural App Indian farmers is a mobile application for Indian farmers. Krishi Network provides a platform for Indian farmers with their agricultural needs, live mandi price and agriculture experts backed crop protection. Indian farmers trust the Krishi network app as the single farmer's app with all their agricultural needs ranging from agriculture science or market rates. Progressive farmers check live mandi rates on the Krishi Network app to take the right call on when to sell their produce, Weather forecast is a must-have element for all Indian agriculture apps as the farmer games the nature and plans his moves after checking weather forecasting on this app. Krishi app is a community of active agricultural experts from Indian states

like Uttar Pradesh, Madhya Pradesh, Rajasthan, Punjab and Haryana with active agriculture departments. Krishi network is a household brand for Krishi agriculture apps. It is approved to be one of the best agriculture apps by multiple users in their reviews. Farmers are provided with expert advice for mandi price. This collaborative ecosystem is an active agricultural community that consists of UP farmers, MP farmers app, Bihar farmers and agricultural app-related groups. Besides this, the community explores agricultural activities to learn modern agriculture practices of organic farming.

Weather Forecasting is the main feature of this mobile application as it provides 15 days weather forecasting in advance with the moisture level, humidity, the cloudy, clear sky as its parameters which will help farmers to take farming related decision in better way.

1. Farming related information is also provided in this mobile application. Farmers has to select their crop (pulses, oilseeds, vegetables, cereals, cash crops, spices, fruits and flower and medicinal plants) to get detailed information from the experts, to know the best price of that crop in nearest mandi, farm plowing and soil preparation, various method of planting including dibbler method, seed planter and many others, and also shows various varieties of seeds.

2. Crop protection plays a vital role in protecting crops from various diseases. This application shows disease and treatment to protect and save crops from diseases like Tikka disease, Rotten Roots diseases and many others concerning for crops. It also shows an option for weed control and health and nutritional quality. It also provides the exact dozes of fertilizer, insecticides and pesticides that have to spray on crop on an accurate timely basis.

3. Live Mandi Tracker provides the nearby mandis as per location set by the farmers in this application through the GPS (Global Positioning System) of your mobile it will list all the mandis nearest to your location with mentioning the distance in kilometers. After selecting the particular mandi, the farmers can get the rate/cost of all the mandi crops concerning to particular mandi. In this farmer can also compare the price from other mandis price as well as from the last few days price (whether the price has been increased or decreased from last two days). Farmer's can also get the location of that mandi on google maps so that it provides easy navigation to reach that mandi especially to outsiders.

4. Latest Agricultural News personalized for you for organic farming of major crops. Updates for the price of seeds, fertilizers and pesticides also know about crops to sow for each season. Besides this, it also contains several videos and progressive farmer's details to follow their innovative techniques of smart farming.

   This mobile application is built in multilingual support. It supports 03 languages through which farmers from different states can use this application and get information in their state language. This application supports English, Hindi and Marathi. Farmers and other seekers can download this application from the following link

For Android (from Play Store) :-

https://play.google.com/store/apps/details?id=com.krishi.krishi&hl=en_IN&gl=US

FARMS

FARMS acronym for Farm Machinery Solutions. Its major role is to facilitating the hiring and sale/purchase of farm machinery. It is being implemented by the Department of Agriculture, Co-operation & Farmers Welfare (DAC&FW) under the Ministry of Agriculture & Farmers Welfare through the Department of Agriculture under the Mechanization and Technology Division, Krishi Bhawan New Delhi. This application is designed and developed by National Informatics Center (NIC), Ministry of Electronics and Information Technology, Government of India (GOI). It provides the various option for login either as a famer, CHC/service provider or as a guest user. Before login, one has to register himself on this mobile application by specifying his zone/district. In case, one wants to provide service then he has to login with CHC/Service Provider in this mobile application.

It will facilitate local farmers and citizens of the different States across the country with the Custom hiring services of Farm Machinery Banks, Custom Hiring Centers and Hi-tech Hubs without any computer support sys-

tem. Farmers can book their rented agricultural equipment and can view their booking list as and when needed. After the booking, farmers can give their valuable feedback about timely delivery of implements, quality of implementation, the behavior of service provider and many others.

This app will help the individual farmers, willing to provide their agricultural machinery & equipment's on a rental basis to increase their farm income besides making the optimum utilization of the available Agricultural machineries available in CHCs/FMBs/Hi-tech Machinery Hubs.

This app will provide a platform for sell and purchase of old agriculture machinery to farmers also.

This mobile application is built-in multilingual support. It supports 12 languages through which farmers from different states can use this application and get information in their state language. This application supports English, Hindi, Marathi, Telugu, Kannada, Tamil, Gujarati, Punjabi, Bengali, Malayalam, Nepali and Urdu. Farmers and other seekers can download this application from the following link

For Android (from Play Store) :-

https://play.google.com/store/apps/details?id=app.chcagrimachinery.com.chcagrimachinery&hl=en_IN&gl=US

VII.   E-AGRICULTURE AND RURAL WORKING

The Survey has been done in the few villages and towns of Pali District of Rajasthan, India concerning to an adaptation of e-Agriculture concepts, lots of advancement and programmes by rural farmers of Rajasthan. Here are few details provided in-depth.

METHODS

Survey and Its Analysis: A Survey was conducted while using a random sampling method. I have selected 10 villages/towns of Pali District and analysis was obtained through purposive sampling technique. All the information was gathered with the help of a structured questionnaire which was created in the local language of the villagers. The number of respondents from each village is exactly 10 rural farmers based on several factors like age, gender, qualification, size of cultivable area etc. The total number of participants was 100 which was considered for the survey. The majority of the participants were found to be in the age group of 30-60. It was found that 80% of the rural farmers especially from the age group of 50-60 are uneducated and they are unaware of the modern techniques of farming which leads to smart and precision farming they are just using local and traditional techniques of farming and thus not well equipped and not having proper sources of livelihood and even they do not posse's awareness of various E-Agricultural services of the government. 20% were found to be educated, accept and adopt the innovative invention in agriculture related to ICT and ready to accept the new challenges and they also have awareness of various services of government as E-agriculture is concerned.

Research type	Survey
Sampling technique	Random sampling
Instrument used	Structured questionnaire
Scale used	Rating scale
Questionnaire language	Hindi
Total questions in the questionnaire	15
Total Villages/towns Considered for the survey	10
Total population taken for the consideration for survey	100
Total no. of questionnaires considered after survey	100

S.No.	Name of the Village/town	Population
1	Aaichiya	15,239
2	Akeli	14,689
3	Akrawas	13,158
4	Akrawas Purohitan	12,211
5	Bader Ka Was	13,919
6	Bagariya	18,808
7	Bala	21,308
8	Baldo Ki Dhani	15,224
9	Balelao	15,362
10	Balrai	18,014
11	Baniyawas	17,196
12	Bhalelao	16,193
13	Bhambolai	14,321
14	Bhangesar	17,251
15	Bhanwri	25,401
16	Bhaton Ki Dhani	14,120
17	Bhawnagar	13,540
18	Bomadara	20,395
19	Budhwara	16,614
20	Busi	32,719
21	Chanchori	41,347
22	Changwa	21,129
23	Chawarda	16,213
24	Dayalpura	22,677
25	Deeri	26,213
26	Denda	33,261
27	Dingai	37,292
28	Endlawas	18,436
29	Giradra Jageer	9,904
30	Giradra Khalsa	26,306
31	Girwar	18,280
32	Godawas	10,122
33	Gulabpura	16,303
34	Gundoj	61,347

35	Gura Bichchhu	17,063
36	Gura Durgadas	9,779
37	Gura Endla	54,982
38	Gura Khuni	19,227
39	Gura Narkhan	16,305
40	Gura Pratapsingh	17,261
41	Gura Sonigara	12,106
42	Guragirdhari	9,839
43	Gurdai	41,539
44	Hathlai	11,197
45	Hemawas	54,658
46	Hirankhuri	12,706
47	Indra Nagar	30,349
48	Jaitpura	23,282
49	Jawariya	24,975
50	Jooni Endla	28,282
51	Kalyan Pura	12,197
52	Kandara	26,439
53	Kanlao	20,731
54	Keerwa	13,971
55	Kenpura	18,108
56	Kerla	19,664
57	Khati Khera	9,315
58	Khatukra	20,956
59	Kherwa	77,591
60	Khetawas	22,445
61	Khor	87,070
62	Koorna	23,625
63	Lambiya	28,106
64	Madri	29,786
65	Mandal	38,214
66	Manihari	42,239
67	Muliawas	20,095
68	Nadana Bhatan	24,173
69	Nawagura	25,638

70	Neembala Khera	16,421
71	Neembara	27,312
72	Neembli Urra	28,606
73	Nimbara	28,286
74	Padarla	17,495
75	Padarli Turkan	18,289
76	Parasla Kalan	22,652
77	Parasla Khurd	17,437
78	Penawa	18,675
79	Pratap Garh	19,673
80	Ramasiya	28,285
81	Rampura	16,237
82	Raunagar	13,211
83	Rawalwas	12,015
84	Roopawas	16,548
85	Saali	17,235
86	Sadawas	14,348
87	Sakdara	19,904
88	Sankrawas	14,292
89	Sanpa	17,625
90	Sapooni	20,971
91	Sedariya	17,622
92	Shivpura	17,213
93	Sodawas	22,214
94	Sonai Manji	29,213
95	Sowaniya	24,270
96	Sundelao	17,613
97	Tewali Kalan	34,281
98	Tewali Khurd	18,282
99	Thakurla	31,280
100	Togawas	18,810
101	Utvan	35,108

TABLE 2: LIST OF VILLAGES AND TOWNS UNDER PALI DISTRICTS WITH ITS POPULATION.

VIII.   RESULTS

From the analysis, it is very clear implication that the rural farmers of Pali Districts are having lack of awareness on E-agricultural services and various ICT resources and various programmes of the Government and private sectors. Therefore, it became essential to provide themtraining and knowledge about the advancement of farming in nowadays. Awareness of ICT and its various services had been provided to the rural areas in a speedy manner so as to enjoy the benefits of various ICT services by rural farmers in Pali District of Rajasthan, India. In lack of livelihood, farmers are also shifting their occupation from agriculture to other sectors. To overcome all these issues, we have to take some important and immediate measures.

IX.   CONCLUSIONS OF SURVEY

From the study we came to know that E-agriculture services provide several benefits like increased quality in products, increased productivity, high income, good livelihood, increased efficiency, raised Profit, get expert help as and when needed, reduce risk and uncertainty, easy knowledge gathering about the climatic condition, humidity, soil type, crop pattern etc. and can speedily share agricultural information. E-agriculture facilitates timely and accurate updates regarding current market price & market demand to farmers at a lower cost and lower risk using ICT enabled devices such as mobile phones, radio and television, through internet services and many mobile applications related to agriculture. Therefore, creating awareness among the rural areas regarding ICT and ITC programs, plays a vital role in achieving rural development. If ICT awareness had been created among the rural masses that may lead to the social and economic wellbeing of farmers and that leads to rural development as well as national development.

Despite, all these benefit of ICT in agriculture, lack of knowledge, improper usage of controlled devices, lack of awareness among farmers about the different schemes proposed by the government in support of farmers, all these inventions and innovative ideas are of no use. So, this becomes very important to take the right step at right time.

X.   CONCLUSION

The Agricultural sector plays a vital role in the Indian economy. It leads to major changes in the rise or fall of monetary value in the economy as India is an Agricultural based Country. Here, Major sector for more than half of population depends on agriculture which provides food and basic living commodities to other nation as well. But from last few years, these traditional agricultural practices had been changed a lot and this required refining the traditional practices of agriculture for farmers. As e-agriculture leads to major changes and brings advancement in the agricultural field through which productivity, quality of seed, ease of working through various advance machineries, usage of ICT in agriculture mad farming easy nowadays. But its correct usage by the farmers especially uneducated farmers is solely responsible for its success. So, there is a need of awareness among farmers.

ACKNOWLEDGEMENT

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