12. Agro Informatics

12.1 AGRO INFORMATION TECHNOLOGY

An huge amount of innovations are awaiting adoption. Agriculture is at the peak of research and development. Information Technology is the best way for fast and effective dissemination of agricultural technology.

Use of electronic gadgets and software for storage, analysis, transfer and retrieving information is termed as informatics. Informatics in agriculture has a tremendous scope and potential in converting resources in to prosperity. Agro-informatics is the application in agriculture with innovative ideas, techniques and scientific knowledge to expand horizons of computer. It is information technology applied to management and analysis of agricultural data. It is well recognized that the digital images and video clips of actual application of agriculture technology have greater impact on the minds of the farmers than the textual descriptions of the technology.

Flow of information from the source to receiver should be faster, effective and economical. Modern devices and systems like computer, mobile (cellphone), internet, etc., are capable to store, process, communicate and regenerate the information at a highest speed with lowest cost.

12.1.1 Meaning and use of modern devices and systems in agriculture

A. Computer :

It is a magic box which can accept information through different input devices in various media like visual through camera and scanner, audio through microphone, analog/digital through keypad or mouse. Capacity of a computer to store information is just unlimited. It can process huge data within a fraction of a second. We can obtain output from computer by various ways like display on monitor, sound through speaker, hard copy from printer, visual from projector, etc. When a computer is attached with internet system, it is empowered by the ocean of information in the world wide web (www).

Computer can be used at each level in the process of communication. At the source, a scientist or expert/ subject matter specialist can use computer to shape the information in written, pictorial, movie or audio form. Then it can be spread/ disseminated to the extension workers through CDs, VCDs, micro SD cards, USB storage devices or through internet in any audio, visual or audiovisual form. Extension worker can load the information in his computer and use it in the process of communication with the farmers. If available, farmers can also use their computers or any electronic gadget to store and use information. Computer is also helpful to obtain feedback from the receivers at each level. Farmers can easily access required information on crops, stored systematically using a network of computers. Some farm management software can help farmers to maintain their farms more efficiently and increase productivity of inputs used.

Examples of operating systems are Microsoft Windows, Ubuntu Linux and examples of web browsers are Microsoft Internet Explorer, Mozilla Firefox, Google Chrome, Apple Safari, etc.

B. Internet :

Internet is a global network that connects the computers across the globe. The long form of Internet is international net work.

Specially in the science of agriculture, there is a vast gap between advanced countries and that of undeveloped countries. Internet

facilitates developing countries to get direct access to the research and experience of developed countries and use it for improvement in the field of agriculture. Internet is also used in searching market information about particular input as well as output of the agriculture. Online marketing has opened new horizons of national and international market down to bunds of the farm.

Internet facility can be availed/ obtained on the computer, laptop, tablet computer, mobile (cellphone), etc. The devices can be connected with internet by optical fiber cable, telephone landline, WiFi, cellphone service providers, etc.

According to available device, compatible internet service can be used. Government agency- BSNL is providing internet through cable and cellphone on concessional rates, particularly to the rural community and farmers.

For operating the concerned websites through internet, softwares like - Microsoft Internet Explorer, Google chrome, Firefox, Mozilla, etc. are used. If the name of a particular website is not known, search engine can be used. Commonly Google.com, Yahoo. com, bing. com, msn.com, aol.com, etc. are opened and words related to the information to be searched are typed in the search box. The search engine displays thousands of related websites. From which, we can select the most relevent and reliable one and click it to open.

The websites are provided by government or non government organizations, private companies or advertising agencies. Websites can be classified based on their domain names. A domain name is the last part of the website e.g. com. gov.in, org.A com website is usually operated by a commercial company while gov.in domain is operated by government departments. Non government organizations use org. domain. The domain name also helps us in identification of the country e.g. in is reserved for India, nl is for the Netherlands while .us is for USA.

> **Some of the improtant websites useful for the farmers are listed below** try to open and get interesting information.
> www.maharashtra.gov.in,
> www.mahaagri.gov.in,
> www.mcaer.org,
> www.agricoop.nic.in,
> www.icar.org.in,
> www.nhm.gov.in,
> www.nhb.gov.in,
> www.apeda.com,
> www.vsisugar.com,
> www.msamb.com.

C. E-mail :

It is a process of sending and receiving messages in electronic (digital) form with or without attached files to other service user. E-mail has high speed of communication and respondent can view or refer it at his convenience and by multiple times. It saves paper thus classified in eco friendly practice. It is an integral part of the concept – 'paperless office'.

D. Cellphones :

Cellphone is a devise with access to a cellular radio system so it can be used over a wide area without physical connection to a network. Cell phones are used to send or receive phone calls, text messages, e-mails, photos and video as well as access the internet, use GPS for getting agriculture information.

Remember this

Cellphones are popularly used by most of the farmers and labourers. India is the second largest user of cellphones in the world. About 91.35 crores cellphones are used in India.

E. Smartphone apps :

Most of the farmers are now handling smart phones. It is the easiest and cheapest gadget of information technology. If used wisely, a flow of knowledge will appear in the hands of farmers. Need is to educate them how to search information from reliable websites.

Try this

Install some of these apps in a cellphone and see its utility. You can also guide a farmer to obtain benefits through such apps.

Some of the most popular applications (Apps) and their uses

Sr. No	App	Uses
1		**Indian Council of Agricultural Research** Information regarding agricultural education and research. Different training programs related to agriculture and allied business. ICAR has different centers for research and education for example, Central Institute for Cotton Research (CICR). Relevant information can be obtained in regional languages also.
2		NCDEX app has instant access to prices, news, updates, market data and analysis for commodity of their choice. It helps dealers, investors, traders, hedgers and corporate managers. This app provides real time features/ spot prices and commodity news. It is a smart, more personalized and intelligent tool to make it easier than ever for investors to stay in touch with the market and with each other. The dealers and wider trading community can now make important trading decisions anywhere and at anytime on their devices.
3		**Maharashtra State Agricultural Marketing Board** *(Panan Mandal)* The Maharashtra State Agricultural Marketing Board (MSAMB), has done pioneering work in the field of Agricultural Marketing in the State and achieved success in various areas. MSAMB has an important role in developing and coordinating agricultural marketing system in the State of Maharashtra.
4		"**IFFCO**" *Kisan* is an Indian farmer *suvidha* App. which helps the Indian farmer/ *Kisan* to take informed dicisions by accessing customized agricultural information related to their need. It has following features. **Weather :** This section provides instant access to weather forecast for next 5 days in the set preferred location. **Market or *Mandal* :** Farmers can get instant access to *mandi* prices for their produce, market status and prevailing trade prices along with quantities. **Agricultural Advisories :** This is a crop specific advisory service for various agro-climatic zones. **Ask our Experts :** Farmers can just take a photo of the plant or concerned area/ disease and send it to the experts who will provide personalized solutions through voice call. *Gyan Bhandar* : An Agricultural information library for the farmer to get neassary information. **Market Place :** This feature is the buyer and seller meeting platform, where a buyer or a seller can register his/ her buying or selling requirement/s. It will help them to buy or sell faster, with higher profitablity

5		**Startup India :** Startup India is a flagship initiative by the Government of India, intended to build a strong eco-system for nurturing innovations and startups in the country that will drive sustainable economic growth and generate large scale employment opportunities. The Government through this initiative aims to empower startups to grow through innovation and design. This is the official mobile application for startup India developed to assist users to easily source information from the official startup India website at http://startupindia.gov.in. Be in touch with Startup India initiative and get the latest news, events, information about Startups, Incubators, IMB, State wise information, action plan and FAQs, etc. right in your hand. The app will allow users to apply for Recognition of Startups and Incubators and also allow users to validate Recognition of Startups and Incubators.
6		**Indian Meteorological Department :** It is the National Meteorological Service of the country and the principal government agency in all matters relating to meteorology, seismology and allied subjects. This app provides authentic information related to weather conditions, forecast and alerts.
7		**Weather Bug** Local weather conditions and predictions, alerts to take decisions in planning of agricultural practices.
8		**Accu Weather** Local weather conditions and predictions. Weather alerts to take decisions in planning of agricultural practices.
9		*Kisan Yojana* Information regarding the different schemes of government in the field of agriculture.
10		*Sehetkari Magazine* "Shetkari Masik" is one of the most popular low price monthly magazine since 1965. The main purpose of 'Shetkari Masik" is to provide information about agriculture and agro-suite modern technology to reader. It provides guidance for all field crops, animal husbandry, poultry, fishery, forestry, agro industry, biotechnology and much more. **Core features** • Shetkari Masik App is available in 'Marathi' language. • Downloaded magazine can be easily read anywhere, anytime and in offline mode. • All previous magazine editions are also available for download.

Very useful apps are made available by government and private agencies. It facilitates easy access to information, communication and expert advice, buying of inputs, trading of agricultural produce and much more. Weather reports and forecasting are other important facilities available on mobile apps.

F. Video conferencing :

It is an audiovisual communication between two or more persons from different locations through the videophone or Internet. Devices required in this system are videophone or cellphone (preferably with dual camera) or computer/ laptop with web camera. Highspeed Internet connection is required for clarity and smoothness in conferencing.

This system enables to obtain guidance of experts located at any place. As the expert has no need to travel and be physically present at the receiver's location, it saves valuable time of the expert and unnecessary expenses on traveling and other facilities.

Videoconferencing may be of two types-

a. Farmers are called at a specific location and time so that they can virtually see and discuss with the expert on screen.

b. Farmers are informed to call a particular expert on predecided time. Here the farmers are calling from different location and expert is at specific place.

G. Global Positioning System (GPS) :

Fig. 12.1 GPS Receivers

GPS is a system that uses signals from satellites to find out position of an object.

Global Positioning System (GPS) is being applied in agriculture facilitating benefits in geo-fencing, map-making and surveying. By using GPS, one can prepare simple yet highly accurate digitized map without the help of a professional.

GPS enabled tractors, drones and much more mechanisms are now manufactured in India and becoming popular in farmers. By GPS mapping, these machines can be used without any operator. It enhances accuracy and efficiency in automization of agricultural practices.

Fig. 12.2 GPS Enabled Tractor

Wild animals are now being tagged with GPS tracker. When the animal crosses a geo-fence, forest authorities are alerted by SMS, they track the animal and scare them to protect civilized as well as agricultural zone.

H. Geographic information systems

Geographic information systems, or GIS, are extensively used in agriculture, especially in precision farming. Land is mapped digitally, and accurate and detail data such as topography and contours are combined with other statistical data for easier analysis of the soil. GIS is useful for planning such as what to plant and where to plant using historical data and sampling.

I. Agricultural clinics

Agricultural clinics are envisaged to provide expert advice and service to farmers on various aspects to enhance productivity of crop/ animals and increase the income of farmers.

Agricultural clinics provide support in the following areas.

1. Soil health
2. Cropping practices
3. Plant protection
4. Crop insurance
5. Post harvest technology
6. Clinical services for animals, feed and fodder management
7. Prices of various crops in the market.

A special training program is being implemented by National Institute of Agricultural Extension Management (MANAGE). It is 45 days free of cost residential training program. Candidates can avail bank loan up to 20 lakhs with subsidy of 36% (for general category) and 44% (for SC, ST category and women).

Do you know ?

After completion of H.S.C. with agriculture subject, you can participate AC and ABC training as mentioned above. Minimum 55% aggregate marks are necessary to qualify for admission.

Fig. 12.3 Automization in agriculture

I. Agricultural Technology Information Centre (ATIC)

It is a "single window" support system linking the various units of a research institution with intermediary users and end users (farmers) in decision making and problem solving exercise.

Services provided by ATIC

- Diagnostic services for soil and water testing, plant and livestock health
- Supply research products such as seeds and other planting materials, poultry strains, livestock breeds, fish seed, processed products, etc, emerging from the institution for testing and adaptation
- Sale of publications and communication materials as well as audio-visual aids produced by the research organisation

ATIC in Maharashtra

Name of ATIC	Contact Details
Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Dist. Ratnagiri	02358280238
Mahatma Phule Krishi Vidyapeeth (MPKV), Rahuri, Dist. Ahmednagar	02426243861 02426243373
Dr Punjabrao Deshmukh Krishi Vidyapeeth (PDKV), Akola	07242259262
Vasantrao Naik Marathwada krishi vidyapeeth (VNMKV),Parbhani	02452223801

Q.1. Answer the following questions.

A. Select the appropriate alternative and complete the following statements.

1. --------- is a process of sending and receiving messages in electronic (digital) form with or without attached files to other service user.

   a. e-mail   b. letter

   c. document   d. parcel

2. For convenience of finding proper source and information on the world wide web, ---------- are used.

   a. search engine

   b. email

   c. MMS

   d.internet explorer

3. The website of ---------- enables access land records like 7/12 extract and property card.

   a. www. icar.org

   b. www. nhb.gov.in

   c. www. vsisugar.com

   d. www.mahabhulekh maharashtra.gov. in.

4. ---------- initiative aims to provide information to the farming community through toll-free telephone lines

   a. shetkari magazine

   b. kisan call centre

   c. startup India

   d. none of these

5. ---------- is an app providing information regarding local weather conditions and forecast.

   a. Startup India   b. *CICR*

   c. Accuweather   d. ICAR

B. Make the pairs.

'A' Group	'B' Group
1. GPS	a) Information and Communication Technology
2. ICT	b) General post section
3. ATIC	c) Agricultural Technology Information Centre
	d) Global positioning system
	e) Indian crop technique

C. Find the odd one out.

1. Android, Lenux, Windows, Excel

2. SMS, Google, MMS, Email

3. ATIC, Computer, Laptop, Cellphone

D. Write true or false.

1. Conferencing video is time consuming technology.

2. Startup India is an app to encourage Indians especially youngsters to take up entrepreneurship as a career.

3. Irrigation, fertilizer and pesticide application, etc. are automized by using micro processors or computers.

4. Computer can process data within a fraction of a second.

5. Wild animals are now tagged with GPS tracker which help in protection of fields.

Q.2. Answer in brief.

1. Name any two most commonly used search engines.

2. What are the advantages of using weather related apps ?

3. Which web browsers are used to open web pages on internet ?

4. Write the information about MSAMB app.

5. What is the use of information technology in agriculture and allied fields?

Q.3. Answer the following questions.

1. Write in brief about Geographic Information System.

2. Enlist the Agricultural Technology Information Centres (ATIC) in Maharashtra

3. Write about *IFFCO Kisan - mobile app facilities*

4. Name any two Smartphone applications for farmers with their uses.

5. List out important websites useful for farmers.

Q.4. Answer the following questions.

1. Describe Computer and Internet.

2. What is an Agricultural clinic?

3. List out the services provided by Agricultural Technology Information Centre.

4. Write about start up india app.

5. Write in short about MSAMB

Q.5 Answer the following question in detail.

1. What are the uses of Internet in agriculture?

2. Write the information on Global Positioning System (GPS) in agriculture.

Q.6 Answer the following questions in detail.

1. List out most popular apps and give their uses.

2. What are the uses of computer and internet in agriculture?

Activity

• Search websites of different agencies providing information and services related to agriculture.

• Download the applications in Smartphone which are useful for farming, weather alerts, etc.

Agro information technology