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Information Technology in Agriculture

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Abstract:-
This research paper highlights the issue related to the role of information technology (IT) in agriculture with emphasis on developing countries. It summarises the importance of information in generating and disseminating agriculture technologies, identifies categories of user as well as the forms and means on information dissemination. The paper further focus on current development in information technology covering various IT devices and their application in information management. The paper also outlines the current initiatives improve information infrastructure in India, which aim at facilitating agricultural development through application of information technology. The paper gives a list of policy statements on agriculture information issues as extracted from the current Agriculture.

Information:-

Agricultural Sector, Agricultural Information and Information Technology

The agricultural sector plays a predominant role in economies of many developing countries. India, for example, the sector contributes about 14% of the country's GDP, generating more than 60% of total export earnings and more than 80% of the labour force. Besides, the agricultural sector provides the bulk of the India food requirements and raw materials for domestic agro-industries. Agriculture is also the single main determinant of the incomes and welfare of the rural majority; thus is holds the key to the socio-economic development of India. In that connection, constraints on agricultural development can constitute great obstacles to the country's development.

The vast store of information on agriculture has been built up in the world over many years with the ultimate aim of increasing agricultural production. There-fore, improved information flows to-, from-, and within the agricultural sector is a prerequisite for effective agricultural development. Investing in information technology can facilitate effective flow of information in all sectors of the economy. Information technology (IT) can broadly be defined as the science or practice of collecting, storing, using and sending out information by means of computer systems and telecommunications. Moreover, the combination of old and new information and communication technologies of broadcasting, telecommunications, the Internet, CD-ROM, satellite and cable have created abundant applications of IT to facilitate access to information. Information and communication together with the associated technology go together in the whole process of ensuring access to the required information for various users hence the popular acronym, Information and communication technologies. To sum up, the need for information on agriculture is derived for the following crucial factor .

The critical role of agriculture in economics and social development in most developing countries.

Associated issues of food security and welfare.

The needs to increase yields.

The needs to improve quality.

The need to avoid costly mistake.

Information as a vital resource for farmers

Farmers need information on invented technologies from the technical system to used them for agricultural activities and their production. The generated technologies may include optimal planting and harvesting times, appropriate methods of pest and disease control, appropriate soil erosion control measures, processing and storage methods, and so on.

Farmers also need marketing information so as to make appropriate decisions on where to sell their farm produce. Marketing information has a major effect on whether a farmer's production is profitable or not. This kind of information not only helps farmers make profitable decisions in the short term on when and where to market produce and what price to expect, it also sometimes helps farmers decide what to produce. Farmers want to knowledge for market values as well as market system have a big chance of profit than those who do not. The businesspersons or dealers have usually much better access to market information than our small-scale farmers they buy from do. It is thus common for farmers to end up bearing the greater low price risks while the dealers end up with the greater part of the profits.

Current developments in information technology

Information technology offers many opportunities for improving agricultural production in developing countries due to increased possibilities for faster and better-focused access to information, its transfer and communication between different users. Microcomputers and telecommunications, in particular, together with associated electronic networks and digital storage and transfer, are having an increasing impact on the handling of information worldwide. Recent revolutionary advancements in ICT have further resulted in dramatic falls in the cost of processing and transmitting information.

Microcomputers:-

Microcomputers are effective for rapid handling and huge storage capacities; as such they are used to build and retrieve bibliographic and full-text databases, transfer or import data to from external sources, managing catalogues of volumes of documents in agricultural information centres, and many other functions. The use of microcomputers goes hand in hand with the adoption and use of function-oriented software. The agricultural information systems of many developing countries have adopted the UNESCO's micro-CDS-ISIS for developing local databases. The FAO-coordinated international information exchange systems, i.e. AGRIS (International Information System for Agricultural Sciences and Technology) and CARTS (Current Agricultural Information System) are based on CDS-ISIS.

The Compact Disc Read Only Memory (CD-ROM):-

The CD-ROM is an optical storage medium allowing storage of text, graphics and images. The CD-ROM technology has improved access to agricultural information in Africa as the discs can easily be mailed to remote areas and are non-dependent on telecommunications. Further, one of the advantages of CD-ROMS is their high storage capacity (one CD can store the information equivalent to 2,50,000 printed pages of text). they arc durable, standardized and arc resistant to magnetic full& or electric Current. Major agricultural information providers in the world have produced their information products in CD-ROMS_ These include CAB-international (CAB-CDs), US- National Agricultural Library (AGRICOLA), FAO (AGMS). the Royal Tropical Institute, KIT (TROPAG RURAL),CIRAD(sesame) and others. Recent developments have witnessed production The Essential Electronic Agricultural Library (TEEAL) on CD-ROM.

Desktop Publishing (DTP) :-

The DIP technology incorporates the use of computers and facilities. For typesetting. graphics design and document production. Many DTP software allow simple or complex operation that may result in the production of such publications as newsletters, leaflets, brochures and books. With good quality printer& and photocopiers, many agricultural institutions have been able to produce quality in-house publications.

Telecommunications: -

The telecommunications is the backbone of ICT services and applications, and it has been established that the density of telephone lines has a direct and positive correlation to economic development. Traditional information technologies such as wired telephones fail to reach the majority of the marl population in the developing world. Access to information technology8 opens new opportunity not only for agricultural extension, but also for conveying information on markets, education, primary health care and other aspects related to rural development. Farmers in parts of India have begun to use information technology to get market information; in doing so they would improve the competition in agricultural input and output markets.

Electronic Communication: -

We are still the era of information revolution or information age: people the world over are using computers linked to telecommunication systems exchange messages (e-mail), transfer files, carry out business transactions, take part in conferences and forums, access information on stock markets, and access news and any other information over huge distance at relatively low cost. The e-mail messages are travelling along global information by internet system which is the world-wide network of computers and people giving access to huge amount on information all over the world instantly.

Websites & Application :-

In the current generation most of the farmers connected to the fastest technology, they access the different web sites for the gaining the soil knowledge as well as preparing the medicines for the agriculture. Main lookout of the android application, it very easy to handle and understandable to gain knowledge as well as business purpose source. In the E-communication most of the things handle by the

using of website and application. This both things or both technology are medium for the development source.

Farm yard manure (PIM) collection:-

About 30kg of the FYM (mixture of caw and goat dung) were collected dried, ground tired sieved through 2mm sieve. The 2mm sieved FYM was used for the characterization of the FYM and for the glasshouse incubation pot experiment.

1) Soil analysis :-
Some physical and chemical analysis for the characterization of the five soil sub-groups used in the study were undertaken in the Department of Soil Science, SUA. Particle size distribution was determined by the Bouyoucous hydrometer method (Day, l965). Soil pH was measured in soil water and 0.01 MCaCl2 suspensions using a soil solution ratio of 1:2.5 (McLean, 1982). Organic carbon was determined by the method of Walkley aril Black (Nelson and Sommers, 1982). Total nitrogen was determined by the macro-Kjeldahl method (Bremner and Evlalvariey, 1982). Available phosphorus was determined by the Bray and Kurtz no 1 method (Bray and Kuril; 1945). The cation exchange capacity was determined by the ammonium acetate saturation method at pH 7.0 (Thomas, 1982) and exchangeable (7.2•' and Mg in the ammonium acetate filtrates by atomic ab-sorption spectrophotometer.

2) Analysis of the fast yard manure :-
The pH of the FYM was determined in FYM: water and FYM - 0.01 M CaCl2 suspensions at the ratios of 1.:5. Total organic carbon, nitrogen, phosphorus, total sodium, calcium, magnesium and potassium were determined using the procedures by Okalebo et al (1993).

3) Glasshouse incubation pot experiment :-
Fifteen 2kg soil samples for each soil sub-group were weighed into 3-litre capacity plastic pots with holes at the bottom for drainage. The fifteen 2-kg soil samples in the plastic pots for each soil sub-group were thoroughly mixed with five rates of 0, 2.5, 5, 10 and 20g FYM/2kg soil and replicated three time. The soils - FYM mixtures were incubated for 35 days at 75% field capacity using distilled water. At the 35th day of incubation, samples were taken front each pot and analysed for soil pH, exchangeable Ca2+ and Mg2+ and cation exchange capacities.
The soil pH, cation exchange capacity and exchangeable calcium and magnesium values for each soil subgroup at various levels of FYM were statistically analysed.

Table 1: Some of the properties of the five soil subgroups

Soil Type(US soil taxonomy	PH H_20	PH 0.01M $CaCl_2$	OC %	Bray-1-P mg/kg	Total N %	TCEC Cmol/kg soi	Exchangeable bases Cmol/kg soil K	Na	Ca	Mg	Particle size distribution (%) Sand	Silt	Clay	Textural Class
Paleustult (P_1)	4.77	3.83	1.58	0.93	0.04	7.94	0.51	0.09	1.80	0.46	28.74	5.07	63.46	C
Typic Paleustalf (P_2)	5.56	4.45	2.24	0.87	0.05	10.69	1.26	0.08	4.20	1.17	27.44	7.15	61.50	C
Vertic Ustifluvent (P_4)	5.82	4.60	2.31	1.02	0.04	9.78	1.08	0.10	3.50	0.26	29.30	7.16	59.55	C
Typic Rhodustult (P_{11})	5.97	4.93	2.33	0.64	0.04	5.73	0.59	0.07	3.00	0.97	40.24	5.03	50.70	Sc
Typic Ustorthent (P_{14})	5.83	4.84	8.33	1.04	0.04	5.93	0.79	0.05	3.50	1.07	44.20	2.98	38.40	Cl

Key: C = Clay
SC = Sandy Clay
Cl = Clay loam

Table 2: Some of the chemical properties of the FYM

pH H_{20}	OC (%)	Total P (%)	Total N (%)	Total K (%)	Totlal Na (%)	Total Ca (%)	Total (%)
8.75	54.27	0.37	1.90	2.0	0.1	0.9	0.55

Table 3: Effect of incubation of different levels of FYM and different soils on soil pH.

FYM levels (ton/ha)	Soil Subgroups P_1	P_2	P_4	P_{11}	P_{12}	Marginal mean
0	3.65n	4.451	4.551	4.8ghij	4.76hij	4.45+b
2.5	3.69n	4.521	4.72ijk	4.99cdef	4.85fghi	4.55^c
5.0	3.74n	4.58K1	4.80ghij	5.12bc	5.00cde	4.65^b
10	3.75n	4.70jn	4.87efgh	5.20b	5.03cd	4.71^b
20	3.90m	492defg	5.0cd	5.47a	5.36a	4.94^a
Marginal mean	3.75e	4.63^d	4.80^c	5.12^a	5.00^b	

Results and Discussion :-

Some of the physicochemical proper-ties of the five soils :

Some of the physicochemical properties of the Paleustalf, Vertic Ustifluvcrit, Typic Paleustalf and Typic Ustorthent arc Presented in Table.The percentage total nitrogen, available P (mg kg) and cation exchange capacities of all the five soil subgroups were low according to the rating by Landon (1991). The % organic carbon contents were medium for the Paleustult, Typic Paleustalf and Vertic Usifluvent while for the Typic Ustrothent , the % organic carbon was very high (Londan, 1991). The Typic Rhodustult was characterized by low % organic carbon. exchangeable Ca2+ and Mg2+ on the other hand were low (Landon,1991).

Soil mixed with manure at different levels on the CEC of the soils.

FYM	Soil subgroup					
(ton/ha)	P_1	P_2	P_4	P_{11}	P_{12}	Marginal mean
0	8.0q	10.7i	9.8j	5.9w	5.90y	12.78^{c}
2.5	12.820	16.98g	16.56h	11.73t	12.01s	14.02^{d}
5.0	13.13n	18.01c	16.56h	11.40u	12.19r	14.26^{c}
10	13.29m	16.16i	17.25f	12.45p	13.751	14.58^{b}
20	18.27b	18.4a	17.56e	13.88k	17.78d	17.29^{a}
Marginal mean	13.96^{c}	17.25^{a}	16.38^{b}	11.99^{c}	13.434^{d}	

Conclusion:-

This research paper project find below conclusion :-

1. Information Technology is important on every fields, It is provide very impactful result in Agriculture.

2. IT very time consuming in agriculture, It's connected to everyone and staged everyone to single platform.

3. IT helps to provide the different knowledge of market, farming as well as manure, medicines.

4. Used of Technology farmers improved the business in agriculture.

5. Electronic-Pay also very important part in agriculture, It's very big and needful part in agriculture.

Reference :-

1. https://agricultureandfoodsecurity.biomedcentral.com/
2. https://www.linkedin.com/
3. https://www.intechopen.com/
4. Wikipedia
5. https://www.historic-newspapers.co.uk/