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ICT & ITS IMPACT ON FARMER'S AWARENESS, SOCIO-ECONOMIC TENETS: A DESCRIPTIVE STUDY OF SELECTED VILLAGES IN TELANGANA STATE.

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***ABSTRACT*:** Technology is pivotal in relation to Agriculture. Use of ICT(Information Communication Technology) can increase scale of production from subsistence agriculture to surplus agriculture . To mitigate challenges of agriculture adoption of Technology is the way forward for sustainable and remunerative agriculture Many theories and empirical evidences support that Information age is all about Technology ,Communication, Social media ,Artificial Intelligence. Thomas Robert Malthus(1798) quoted that Population gets increased geometrically, whereas food increases in arithmetical ratio. Agriculture in many developing countries facing multiple challenges such as land fragmentation, climate change , urbanization ,shortage of extensional personnel, soil salinity etc. Today, global economy is closely connected due to which a crisis hit in some part of the world can impact global economy like Domino's effect. Lack of awareness among farming community is biggest impediment for ICT adoption. Technology can compensate low ratio of farmers to extensional personnel in developing nations. Information age Data is the new oil of the economy, where Information is gaining importance. Primary ICTs used in agriculture in developing nations are Mobile, Television(TV),Radio, Newspapers and Magazines. There are different modes and methods for Information Dissemination. It is based on infrastructure availability, geographical conditions, availability of gadgets, socio-economic conditions of the users etc.

***KEY WORDS*: Information Communication Technology(ICT),Awareness, Socio-economic, transparency.**

INTRODUCTION:

Agriculture and allied sector provides employment to half of the population in India. As per Agriculture census 2015-16,there are 15 crore agriculture households in India i.e roughly 54% of total population. Gross Value Added(GVA)added during (2019-2020) at current prices is 17.8%. Bharath is the highest producer of spices, Jute pulses, tea, cashew and milk, and the second-largest producer of wheat, rice, fruits and vegetables, sugarcane, cotton and oilseeds. Even record output of food grains The study is undertaken in Telangana State with a aim of investigating ICT adoption by farming community .Five districts selected spanning across three Agro-climatic zones purposively. The purposively selected villages grouped into three categories namely 1.Progressive villages 2.KVK adopted villages 3. NGO adopted villages .

LITTERATURE REVIEW:

Table 1:Details of Literature

Theory	Year	Developed by	Constructs
Diffusion of Innovation Theory	1960	Rogers	Innovation, communication channels,time and social system.
Theory of Reasoned action (TRA)	1975	Ajzen and Fishbein	Behavioral intention, Attitude andsubjective Norm
Theory of Planned Behaviour(TBP)	1985	Ajzen	Behavioral intention, Attitude, Subjective Norm and PerceivedBehavioral Control
Social Cognitive Theory	1986	Bandura	Affect, anxiety
Technology acceptance	1989	Fred D Davis	Perceived usefulness and perceivedease of use
PC Utilization	1991	Thompson et al.	Job-fit, Complexity, Long-term consequences, Utilization AffectTowards Use, Social Factors, Facilitating Conditions.
Motivation Model	1992	Davis et al.	Perceived usefulness, perceived ease of use, subjective norm , perceptions of pleasure and satisfaction
Extended TAM Model	2000	Venkatesh and Davis	Subjective norm, voluntariness, image, job relevance, output quality, result demonstrability and perceived ease of use
Unified Theory of acceptance and use of Technology (UTAUT)	2003	Venkatesh et al.	Performance expectancy, effort expectancy, social influence andfacilitating conditions
Model of Acceptance with Peer support (MAPS)	2009	Sykes et al.	Behavioral intention, System use, Facilitating conditions, Network density,Network centrality, Valued network centrality and Valued network density.

Krell et al .,(2021) The study examined that though mobiles phones are more commonly found even with low-income group but it is not the same case for Smartphone ,which are only associated with higher incomesMa et al., (2020) The study opines that in China adoption of mobile ICT brings more economic rural developmentPrabha, D., & Arunachalam, R.(2017) Majority of the users preferred (50-100) worded SMS to be delivered early hours daily in local language. Belakeri et al.,(2017) Mobiles cut the travel cost and pass on real time market prices Sankarakumar, R. (2012) Smallholders has very little chance of selling outside orbit of creditors. Dealers who supply inputs such as seed, fertilizer, etc are major source of information in this study area.

RESEARCH METHODOLOGY:

The villages were purposively selected spanning across five districts and three Agro-climatic zones .The researcher took 10% of households of each village studied .The total sample size is 354 out of 360 .Six samples were rejected. Researcher has studied Demography (2011 census) and Samagra Kutumba Survey(2014) of Telangana State **Purposive Sampling:** It is a non-probability sampling. There is no equal chance of data getting selected like in simple random sampling. Expert knowledge is used to select a sample that represents population in a nonrandom manner[4]. Purposive selection of sample data representing universe. This method used for specific study rather than generalize. Frequently used in qualitative research. **Random Sampling:** It is a probability sampling where each and every item has equal chance of getting selected. Farmers in each village selected through random sampling method. Interview schedule is used in survey. Five point Likert scale is used .Sample percentage is calculated based on Krejcie-Morgan formula.

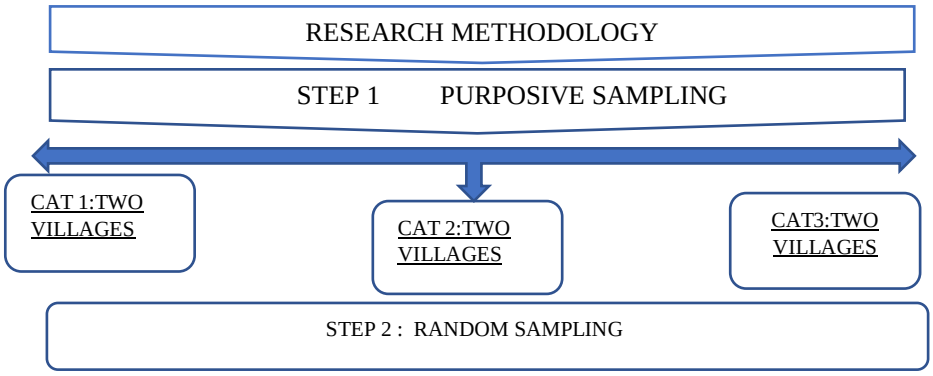

Figure1: Sampling Procedure

Table 2:Survey area details.

Village name	Mandal Name	Total Farmers	Sample	Sample Percentage
Ankapur	Armoor	628	62	10%
Ibrahimpur	Narayanraopet	621	62	10%
Kandlapally	Pudur	533	53	10%
Gaddamalliahgudem	Yacharam	572	57	10%
a)Potpally b)Bidekanna	Jharasangam Zaheerabad	611	61	10%
a)Arjun Nayak Thanda b)Jamgari Bai Thanda c)G.D Thanda	Zaheerabad Mogudampalli Zaheerabad	593	59	10%

OBJECTIVES OF THE STUDY:

1.To study social awareness of the respondents.
2.To assess annual incomes of respondents.
3.To study impact of ICT on decision capacity.
4.To assess impact of ICT on transparency.

RESEARCH HYPOTHESIS:

H_1: There is no significant relation between incomes of ICT user and non-user of ICT.
H_2:There is no significant relation between awareness and ICT use.
H_3: There is no significant relation between decision making capacity and ICT use.
H_4: There is no significant relation between transparency and ICT use.

H_1: There is no significant relation between incomes of ICT user and non-user of ICT.

Here agriculture income includes last five years income generated from agriculture and its allied activities, non-agriculture income is exempted. Total ICT using respondents 224(100) out of which 164(73) acknowledged increase in income , ICT users 15(7) opine no change in income ,ICT users 45(20) opine decrease in income of agriculture respectively. According to Karl Pearson chi-square test at degree of freedom=2 the table value is 5.991,where as calculated Chi-square(χ^2) value=6.641, the significance value calculated is 0.036<0.05(where α=0.05) ,Which is lesser than p value . This represents that variables such as ICT usage and income are significantly related and statistically dependent**. Hence null hypothesis(H_1) is rejected and alternate hypothesis (H_a) is accepted**

Table 3:Impact of ICT use on agriculture income.

			Income			Total
			Decreased	Unchanged	Increased	
ICT Use	No	F	39	13	78	130
		%	30.0%	10.0%	60.0%	100.0%
	Yes	F	45	15	164	224
		%	20.1%	6.7%	73.2%	100.0%
Total		F	84	28	242	354
		%	23.7%	7.9%	68.4%	100.0%

Chi-square(χ^2) value=6.641 df=2 Sig=0.036

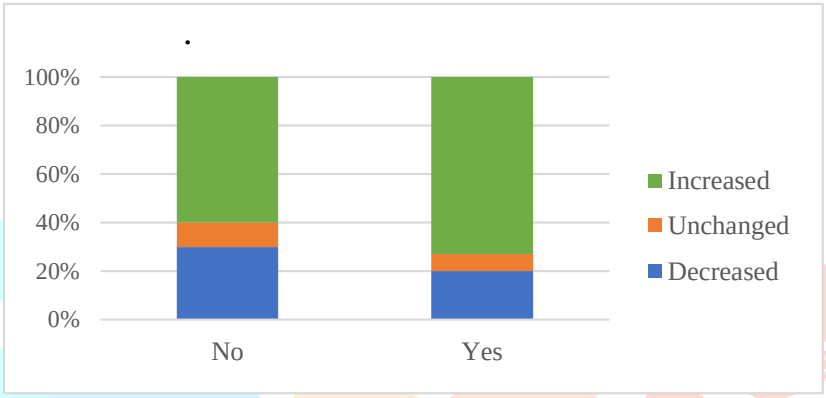

Figure 2:Impact of ICT use on agriculture income

H_2:There is no significant relation between awareness and ICT use.

According to the table ,total respondents are 354(100).There are 11 items framed in questionnaire to check awareness level of farmer, of which ≤ 5 items known is counted as low awareness level ,where as > 5 counted as high awareness level. The items are 1.kisan call centre,2.KVK,3.climate change 4.organic farming 5.e-NAM 6.PGS certification 7.Farm bills 8.GM crops 9.Vermicompost 10. Fasal Bhima 11.Soil Health card .Total ICT users are 224(100),of which 117(52) respondents has high awareness ,while 107(48) respondents has low awareness. According to Karl Pearson chi-square test at degree of freedom=1the table value is 3.841,where as calculated Chi-square(χ^2) value=1.909 the calculated significance value is 0.167>0.05(where p=0.05) ,Which is greater than p value. This represent variables social awareness and ICT usage are significantly not related and statistically independent .**Hence, the null hypothesis(H_2) is accepted and alternate hypothesis (H_a) is rejected.**

Table 4: Impact of ICT use on social awareness.

			ICT USAGE		Total
			No	Yes	
Awareness level	Low	Count	72	107	179
		%	40.20%	59.80%	100.00%
	High	Count	58	117	175
		%	33.10%	66.90%	100.00%
Total		Count	130	224	354
		%	36.70%	63.30%	100.00%

Chi-square(χ^2) value =1.909 df=1 Sig=0.167

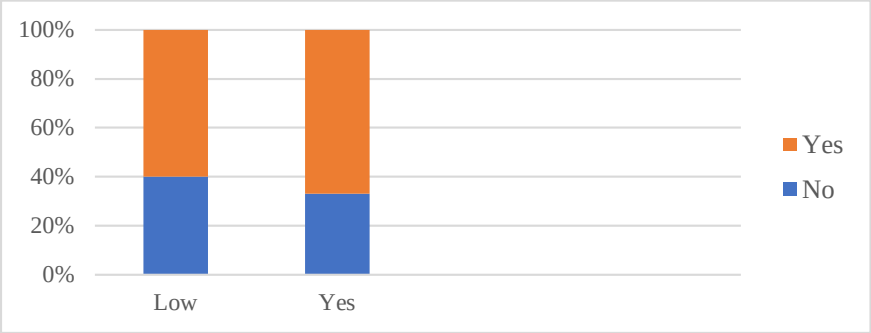

Figure 3:Impact of ICT on awareness

H_3: There is no significant relation between decision making capacity and ICT use.
According to the table 5.31 ,Total sample is 354(100).Total ICT user are 224(100) ,of which 211(94) ICT users decision making capacity is increased. Total non-ICT users are 130(100) ,of which 118(91) opine decision making capacity is increased, this is due to domino's effect. According to Karl Pearson chi-square test at degree of freedom=2 the table value is 5.991,where as calculated Chi-square(χ^2) value=2.505 the calculated significance value is 0.286>0.05(where p=0.05) ,Which is greater than p value. This represents that variables such as ICT usage and decision making capacity are significantly not related and statistically independent**.**
Hence null hypothesis (H_3) is accepted and alternate hypothesis (H_a) is rejected.

Table 5:Impact of ICT usage on decision making capacity**.**

			Decision making Capacity			
			Decreased	Unchanged	Increased	Total
ICT Use	No	F	6	6	118	130
		%	4.6%	4.6%	90.8%	100.0%
	Yes	F	9	4	211	224
		%	4.0%	1.8%	94.2%	100.0%
Total		F	15	10	329	354
		%	4.2%	2.8%	92.9%	100.0%

Chi-square(χ^2) value =2.505 df=2 Sig=0.286

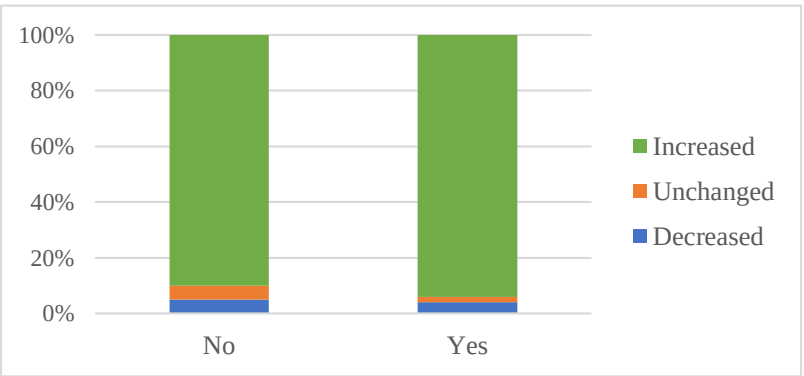

Figure 4:Impact of ICT on Decision making capacity

H_4: There is no significant relation between transparency and ICT use.
According to the table 5.36, the total sample is 354(100).The total ICT users are 224(100),of which 98(44) respondents neither agree nor disagree about transparency due to ICT usage. This is due to novice ICT users. According to Karl Pearson chi-square test at degree of freedom=4 the table value is 9.488,where as calculated Chi-square(χ^2) value=21.573 the calculated significance value is 0.000<0.05(where p=0.05) ,Which is lesser than p value. This represent variables transparency and ICT usage are significantly related and statistically dependent .**Hence, null hypothesis(H_{10}) is rejected and alternate hypothesis (H_a) is accepted.**

Table 6:Impact of ICT use on Transparency.

			Transparency					Total
			1	2	3	4	5	
ICT Use	No	F	1	5	84	39	1	130
		%	.8%	3.8%	64.6%	30.0%	.8%	100.0%
	Yes	F	6	6	98	93	21	224
		%	2.7%	2.7%	43.8%	41.5%	9.4%	100.0%
Total		F	7	11	182	132	22	354
		%	2.0%	3.1%	51.4%	37.3%	6.2%	100.0%

Chi-square(χ^2) value =21.573 df=4 Sig=0.000

Strongly disagree =1 Disagree=2 Neither agree nor disagree = 3

Agree =4 Strongly agree = 5

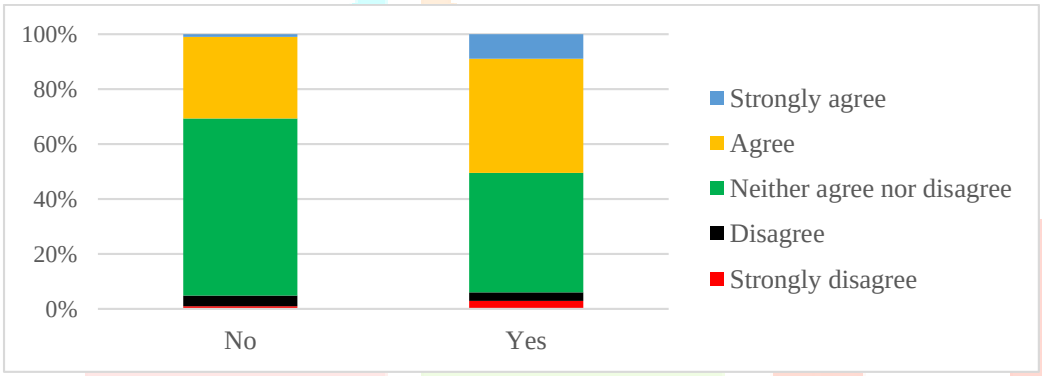

Figure 5: Impact of ICT on Transparency

RESULTS DISCUSSIONS:

The study conducted in five districts of Telangana State. The survey is conducted with basic aim of studying the status of ICT adoption & usage among farmers. After many visits, it is concluded that farmer's lack awareness about adoption and use of ICTs. There are other factors for being handicapped technologically such as poverty, land fragmentation, fear of being unsuccessful etc. Though, Most of the farmers follow some form of ICTs but lack implementation due to various reasons. The AEOs ,who are grassroot level agriculture employees should regularly monitor & mentor the enthusiastic farmers initially. The active farmers can be role model to many in the same village like Dominos effect. Common ICTs among farmers are Mobile, TV, Radio, Newspapers & Magazines. Most young educated farmers prefer using mobile to know agriculture information. Infrastructure development is need of the hour, Rythu Vedikas can act as place where new ideas are exchanged . They can function as Agriculture school, laboratory, Seminar hall for meetings etc. Increase of social participation leads to increase of ICT adoption. There is a positive change in incomes of farmers due to usage of ICT. Impact of ICT on awareness is less due to illiteracy .Impact of ICT on Decision making capacity is low due to farmers still following traditional method .Most of the respondents believe ICT can bring Transparency in agriculture transactions at market place.

RECOMMENDATIONS:

1.Three things required to increase ICT users base by a) Creating awareness about ICTs extensively .b) Active persuasion by AEOs about new technology c)Encouraging active participation of farmers by Agriculture Extension Officer (AEO).

2.AEOs should take measure that at least one member in the household present in the social media group. AEO/AO should be admin of the group to avoid circulating fake and other undesirable contents.

3.Newly established Rythu vedikas should be a place for exchanging ideas for best agricultural practices, field visits, hands on training to alleviate digital divide , seminars etc.

4.Rythu vedikas should act as digital classrooms with internet inside .

5.My research strongly recommends AEOs should be well equipped, trained, available 24X7, and incentivized properly. AEO is a gamechanger in transforming traditional agriculture into ICT based .Because growth of ICT depends on two things a)Creating awareness b)active persuasion by AEOs/AO .

6.An AEO is a known face to the farmers and can be a cluster level brand ambassador to all new launches such as seeds, technology, methods etc . This is effective and economical method of agriculture transformations instead of providing temporary sops to farmers.

7.There is a old Chinese saying that "Give a man a fish and You feed him for a day. Teach a man to Fish and You feed him for a lifetime" so government sops do not feed farmer for long .Creating infrastructure like Rythu vedikas is in right direction.

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