

Technological Transformation And Progress Of Agricultural Development In Gudiyattam Taluk – An Assessment

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Abstract: The present day farming habitually employ trendy know-how such as automation, warmth and moisture sensors, aerial images, and GPS know-how. These highly developed devices and accuracy farming and mechanical structure permit business to be more money-making, competent, safer, and extra environmentally gracious. Contemporary farming knowledge is used to develop the wide types of production learn working by farmers. It is the basis of technological transformation. Advocating technology transfer should believe the various kinds of social capital as a choice policy alternative to the existing top down move towards in order to get better smallholder source of revenue. The key technological know-how modernization in the breathing space encompass paying attention about the areas such as indoor vertical farming, automation and robotics, livestock technology, modern greenhouse practices, precision agriculture and artificial intelligence, and block chain.

Contemporary agricultural practices use mechanized tools for irrigation, tilling and harvesting beside with hybrid seeds. In India, the cultivation know-how are labour intensive, whereas the contemporary agriculture equipment are mostly capital intensive. In this background, the researcher mainly concentrates on Technological Transformation and Progress of Agricultural Development in Gudiyattam Taluk of Vellore of Tamil Nadu in analytical perspectives.

Key Words: Farming, Contemporary Agricultural Practices, Technological Transformation, Progress of Agricultural Development, Social Capital, Sources of Revenue, Modernization, Greenhouse Practices, Precision Agriculture, Artificial Intelligence and Block Chain.

Introduction

Contemporary farming knowledge is used to develop the wide types of production learn working by farmers. It is the basis of technological transformation. It makes use of high yielding varieties of a single crop, scientifically highly developed technology and plenty of energy financial assistances in the appearance of irrigation water, fertilizers and insect repellents. Extremely developed agriculture equipment is the collection of higher system, methods or processes used in the production of goods.

Agriculture Profile of Gudiyattam Taluk

In Gudiyattam Taluk of Vellore district of Tamil Nadu agriculture is the prime driving force for food security, rural economy and sustainable socio- economic development of farmers. Agriculture with its allied sectors is the largest livelihood provider particularly in these areas. Gudiyattam taluk is one of the leading taluk in Vellore district of Tamil Nadu with agro-forestry based economy with vast opportunities in employment and income generational activities. In added to achieve the vision of Second Green Revolution in the taluk has taken steps to reinforce farmer-friendly strategies to increase cropped area, fostering innovative crop-specific agricultural practices, to improve farm productivity and farmers income, designing robust infrastructure to transform the existing livelihood farming into a commercial and dynamic farming system, mechanizing agricultural operations to make farming smarter by saving time and cost, enriching farming knowledge and empowering farming community through use of ICT establishing well structured marketing system and strengthening extension services for large-scale dissemination of productivity increasing technologies, capacity building and supplying critical inputs for Farming Communities.

Statement of the Problems

In spite of the current solid work to augment agricultural efficiency in Tamil Nadu food uncertainty remains a major confront in the state. Improving smallholders' productivity requires the approval of appropriate agricultural knowledge and performs. Before examine adorned the significance of socio-economic factors, but in general unnoticed the situation of social capital in technology implementation and its probable to create cooperative procedures, get smaller operation costs, settle down supply face constraint, and flow in turn.

Using socio-economic data of 80 agricultural households, reviewed social capital, by means of a probity model, as a determinant for Soil and Water Conservation practices (SWC) such as terraces, bunds and agro-forestry as well as implementing Competence Enhancing Technologies (CET) such as fertilizers and enhanced high yielding seed varieties. Therefore, advocate that technology transfer should believe the various kinds of social capital as a choice policy alternative to the existing top down move towards in order to get better smallholder source of revenue. Irrigation is mainly dependent on rain and seeds used are not modern. Contemporary agricultural practices use mechanized tools for irrigation, tilling and harvesting beside with hybrid seeds. In India, the cultivation know-how are labour intensive, whereas the contemporary agriculture equipment are mostly capital intensive. In this background, these researches mainly concentrate on Technological Transformation and Progress of Agricultural Development in Gudiyattam Taluk of Vellore of Tamil Nadu in analytical perspectives.

Objectives

- ❖ To study the Socio-Economic Conditions of Farmers in Gudiyattam taluk of Vellore district in Tamil Nadu.
- ❖ To gain knowledge and awareness on Contemporary Farming Techniques practicing by the respondents.
- ❖ In the direction of explicate development so as to distorted farmers produce food.
- ❖ To learn the harvesting crops technical know-how for in the sample area, and
- ❖ To explain the various technologies using for caring the crops in the study area.
- ❖

Methodology

The study is exploratory cum evaluative in nature. This research work is purely depends upon primary sources of information and statistical data. The area selected for this research work is Gudiyattam taluk of Vellore district in Tamil Nadu, which has wide range of agricultural income and employment generating opportunities. There were 80 farmers were selected randomly in the study area without any discrimination. As the study was planning in the direction of toss glow on the technological transformations and the progress of agricultural developments in the study area, the investigator have equipped a detailed discussion agenda in categorize to gather the required most important statistical information and data. The collected data were to be processed further and consolidated suitably for the purpose of the analysis. The results were carefully noted and they were interpreted rightly, keeping the objectives of the study in mind. The article was written in lucid language with scientific manner.

Review of Literature

Jose & Mani (1997) highlighted that the impact of adaptation of the improved advanced technology on agricultural practices especially with reference to the cropping pattern in Kerala based on the diversities identified with inter district, intra district and inter temporal shifts in their area, production methods and output with relation to rubber plantations, coconut and paddy.

Sankar, Ulaganathan & Kalirajan, Kaliappa (2001) has made an attempt to understand the need of new innovative technological usage in agricultural activities which was at declining phase. The study also highlights on the transformation that has unfolded in the cropping pattern from cash crops to commercial crops.

Shetty P.K. Manorama. K. Murugan. M, and Hiremath M. B.(2014), pointed out that there are innumerable innovations that have been part of agricultural transformation in India. Now, the agriculture sector calls for major reforms, from marketing to investment, institutional change, especially new technologies in water management, land markets and creation of efficient value chains. Agriculturalists also could do with to make use of the frontier technologies like nanotechnology, remote sensing, GIS, genome sequencing, marker assisted technology, weather modeling etc to come out with solutions for ever increasing demands in food production.

SatyawanSaurabh (2020) elucidated that India is one of the leading contributors to domestic and global agricultural production demand. The introduction of the latest technology has been limited due to various reasons such as lack of mechanization, access to credit, and low awareness. Profiteering by middlemen is reducing the income of farmers, which is reducing the purchase of electricity for farmers to adopt new technology.

Ashok Gulati and Ms Ritika Juneja (2021), Indian agriculture has structurally transformed over the long run and the role of technologies, investments, institutions and policies. It further pointed out that articulating with emerging innovations across food value chains, India can remain largely self-reliant in food. There is the possibility of some net surpluses. India can graduate to more nutritious diets, provided agriculture policy is not only crop-neutral but also neutral between consumers and producers.

Significance of study

In the present day farming habitually employ trendy know-how such as automaton, warmth and moisture sensors, aerial images, and GPS know-how. These highly developed devices and accuracy farming and mechanical structure permit commerce to be more money-making, competent, safer, and extra environmentally gracious. The key technological know-how modernization in the breathing space encompass paying attention about the areas such as indoor vertical farming, automation and robotics, livestock technology, modern greenhouse practices, precision agriculture and artificial intelligence, and block chain. Therefore a study on Technological Transformation and Progress of Agricultural Development in Gudiyattam Taluk of Tamil Nadu is appropriate and within society pertinent solitary and be supposed to essential for the time.

Agricultural modus operandi in the study area and the condition of farmers

In surplus of centuries, agricultural is the back bone of the taluk economy of Gudiyattam in Vellore District of Tamil Nadu. Further 65 per cent of our occupant people depend on agriculture to support their source of revenue. In the creation, when our ancestors started cultivation, that satisfied our require totally depending on our immediate environment by utilizing the resources available in the biosphere. Increasing population, the increased wants of human comforts, to satisfy their needs leads to over use of natural resources.

Farming is the most important occupation of irresistible preponderance of the respondents in the study area and the output of this primary occupation is directly making use of as natural resources for other sectors. Rising the demand of the primary segments productivity as contribution of other sectors and the consequence of green revolution put down existing on way to use High Yielding Varieties, Chemicals like Fertilizers, Pesticides, Herbicides and current machineries increased the yield of agricultural more than a period.

Ceaseless utilize of modern methods of agricultural production has a number of shortcomings like surplus utilize of chemicals shows the way to soil and water pollution, use of heavy machines in the pasture consequences in soil compaction, deteriorate the soil composition and decreases diffusion rate leads to run off and soil erosion. At a standstill have oppositions from the side of agriculturalists from diverse part of the situation to keep away from viable crop growing of Hereditarily Customized (HC) crops with the anxiety that it might have an consequence on human wellbeing or in order to turn away from the effect it reason on human being.

Utilization of ICT and Its Impact on Agriculture Sector

Utilization of ICT is tremendously functional for distribution of information to farmers. Extension use of modern information technology needs to be promoted for communication between researchers, extension workers and their farmer clients to transfer technologies and information more cost effectively. Information technology should be made available particularly to those with specific inquiries to guide them in adopting the more knowledge intensive forms of agriculture. Education of the farming community in frontier advancements in agricultural sector through computer based agricultural information centres and Web-based interactive knowledge network system is required. Information regarding technology relating to crops, livestock, weather, market etc. can be delivered by extension officers through web-site agri-portals, interactive multi-media CDs etc. The recent launching of Kisan Call Centre will assist in the transfer of technology to the farming

IT application in Agricultural Marketing

IT application in Agricultural Marketing – Agricultural produce marketing requires connectivity between the market and exporters / growers / traders, industry consumers, through wide area network of national and international linkages in order to provide day-to-day information with regard to commodity arrivals and prevailing rates etc. and to provide link for on-line International Market Information, to provide exports related documentation and the latest research in agricultural marketing, packaging, storage related information and to provide connectivity with leading international and national market organizations.

Wide use of Electronic Mass Media for Agricultural Extension

Wide uses of Electronic Mass Media for Agricultural Extension such as Radio and TV have vastly increased their reach, as also reception facilities. Local radio new FM transmitters open up possibilities of area-specific broadcasts. In communication with audience with low literacy skills, an audio-visual medium like TV has advantages. Today Doordarshan covers the entire population. Much wider and creative use of the mass media like All India Radio, private FM, Doordarshan, private cable network may be promoted for more rapid and effective dissemination of general information and advice to farming communities. This will include market information, market led production planning, on farm and post harvest management, value addition, e-contracting, market networks, market intelligence and wider application of World Wide Web. Face to face contacts should follow and

back up these methods of information dissemination, not precede or substitute them. Central Government will have to support the States in their effort to make fuller use of electronic media.

The Distance Learning Programme through Farm School on AIR and correspondence courses needs specific targeting clientele groups. In agriculture, starting from sowing till harvest in making decision on various issues at different stages, women play a crucial role and increased attention in the areas of leadership, entrepreneurship, post-harvest and processing, value addition etc., have to given by forming Self Help Groups (SHGs). The technology transfer through Plant Clinic Centres and Agriculture business Centres as thrust areas and offering diploma courses for Agri-Input dealers will also strengthen the Transfer of Technology (TOT) activities.

Large scale demonstrations and training of farmers on dry land technologies are needed. Hi-tech training in agriculture for both officers and field level extension staff of the department of agriculture, horticulture and agricultural marketing is needed. To sustain the effectiveness of transfer of technology in agriculture, the field level extension officers also need to be trained in hi-tech agriculture.

Farmers need to be advised by extension workers for proper planning of crops to suit the different agro climatic zones and local market condition. Awareness among the farmers on importance of soil health, environmental pollution, residual toxicity caused by the synthetic chemicals, sustainable farming etc., need to be created and farmers may be motivated to adopt Integrated Nutrient Management (INM), Integrated Pest Management (IPM) practices. Hence adequate funding from Government is essential to generate effective and appropriate innovations and disseminate them to farmers in Tamil Nadu.

Demographic Profile of the Respondents

Table – 1
Demographic, Socio – Economic Profile of the Respondents

Age wise distribution of the respondents		
Age (in Years)	Frequency	Percent
Bellow 25	20	25.00
25-45	31	38.75
45-65	18	22.50
Above 65	11	13.75
Total	80	100.00
Monthly Income (in Rs.)		
Income Category	Frequency	Percent
Up to 20,000	42	52.50
20,000-Rs.30,000	21	26.25
Rs.30,000 -40,000	17	21.25
Total	80	100.00
Occupation Status		
Particulars	Frequency	Percent
Service	47	58.75
Business	15	18.75
Professional	18	22.50
Total	80	100.00
Marital Status		
Particulars	Frequency	Percent
Married	52	65.00
UnMarried	28	35.00
Total	80	100.00
Housing Status		
Particulars	Frequency	Percent
Pucca Houses	20	25.00
Semi – Pucca Houses	23	28.75
Katcha Houses	22	27.50

Others	15	18.75
Total	80	100.00

Source: Complied and Calculated by the Author based on Direct Field Investigation.

Age is one of the determining factors of socio-economic conditions. A family, which contains number of children and age-old People, will highly suffer since their earning capacity is low. On the contrary, a family will be better off, if it consists of more number of earning persons.

The inference can be observed from the table – 1 exposed that the age classification of the sampled population. There were 31 respondents who belonged to 25-45 years age group and 20 respondents belonged to below 25 years age group and 18 respondents belonged 45-65 years age group and rest 11 respondents belonged to above 65 years age group Monthly income wise 42 respondents are earn up to Rs. 20,000 and 21 respondents are earn to Rs. 20,000 – 30,000 and rest of 17 respondents earn to Rs. 30,000 to 40,000. On the other hand, Occupation wise 47 respondents related to service sector and 18 respondents are professional and rest of 15 respondents related to business sector. The details of Contemporary Farming Techniques practicing by the respondents in the study area are given in table – 2.

Table – 2
Contemporary Farming Techniques practicing by the respondents

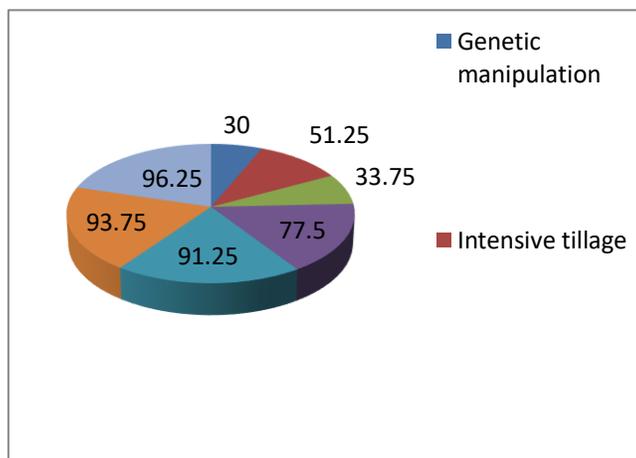
S. No.	Contemporary Farming Techniques	Number of Respondents	Percent
01	Genetic manipulation	24	30.00
02	Intensive tillage	41	51.25
03	Monoculture	27	33.75
04	Use of synthetic fertilizers	62	77.50
05	Irrigation technologies	73	91.25
06	Chemical pest control	75	93.75
07	Combination of Traditional and Modern Agricultural Methods and Technologies	77	96.25
08	Total	80	100.00

Source: Observed during the Primary survey and Field Visit.

Data shown in table- 2, explains the contemporary farming techniques and equipments used by the respondents in the study area.

Figure – 1

Contemporary Farming Techniques practicing by the respondents



It depicts that 30 percent of respondents are using Genetic manipulation, 77.50 percent of the respondents practicing the use of synthetic fertilizers, 93.75 percent of them using Chemical pest control, 91.25 percent are practicing Irrigation technologies whereas 96.25 percent of the respondents practicing Combination of Traditional and Modern Agricultural Methods and Technologies even today.

Types of farming throughout current Gudiyattam Taluk in Tamil Nadu

Monitoring and controlling crop irrigation systems via Smartphone, Ultrasounds for livestock, Usage of mobile technology and cameras and Crop Sensors are modern technologies can be used to improve agriculture in Gudiyattam Taluk of Tamil Nadu.

Most significant crops grown-up in the study area are rice, millets, pulses, sugarcane, oil seeds, cotton, cholam, ragi, and kambu of Lake irrigation and tube wells have made it possible to grow rice in areas of less rainfalls. Contemporary agriculture frequently utilizes intricate equipments. These extremely industrial approach and exactitude cultivation and mechanical structure consent supplementary money-making, well-organized, safer, and additional ecological friendly. Whereas rising crops, more than a few farm behavior encompass to be skillful in order to attain the unsurpassed consequences.

These are proper soil preparation, planting or sowing of crops, plant care management, harvest and post-harvest management. The Characteristic features of agriculture in the study area are Basis of living, Reliance on monsoon, Labour intensive cultivation methods, Under employment, Small and fragmented size of Land holdings, Traditional methods of production, Low Agricultural production and productivity and dominance of food crops. Therefore contemporary practicing of agriculture help farmers to increase their efficiency and it is a developing move towards the agricultural modernization.

Different technologies that are being developed for the agricultural industry

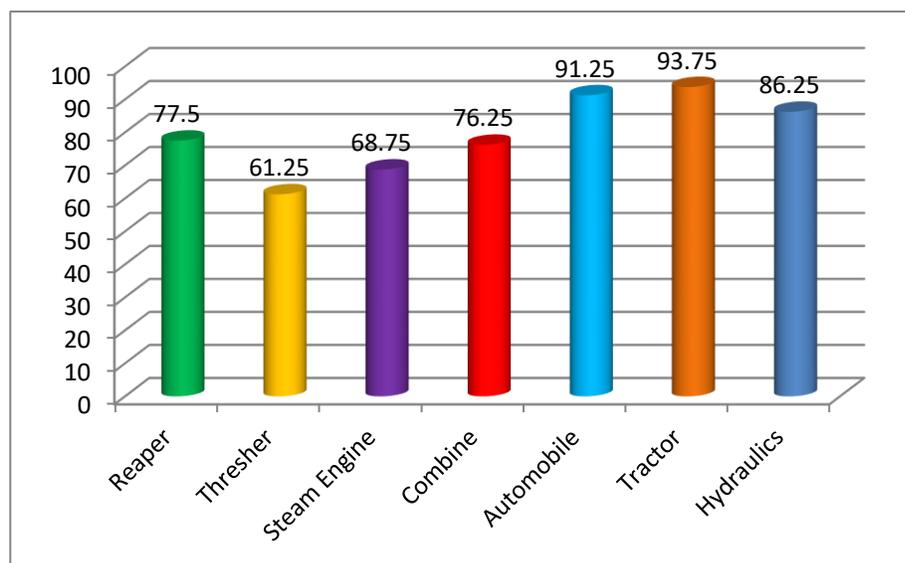
Some major technologies that are most commonly being utilized by farms include: harvest automation, autonomous tractors, seeding and weeding, and drones. Farm automation technology addresses major issues like a rising global population, farm labor shortages, and changing consumer preferences. Tillage reduces soil organic matter, making soils less able to absorb and retain water and more prone to erosion and run-off. The details of inventions that changed farmers produce food in the study area are given in table – 3.

Table – 3
Inventions that Changed Farmers Produce Food

S. No.	Inventions that Changed Farmers Produce Food	Number of Respondents	Percent
01	Reaper	62	77.50
02	Thresher	49	61.25
03	Steam Engine	55	68.75
04	Combine	61	76.25
05	Automobile	73	91.25
06	Tractor	75	93.75
07	Hydraulics	69	86.25
08	Total	80	100.00

Source: Primary Survey and Field Visit.

Agricultural has been around since the dawn of creation. Growing one’s own food was the only way to eat. At one time, food production was hard, laborious work. Thanks to certain agricultural inventions, it has become much easier for farmers to produce food. Data shown in table- 3 reveals the details of inventions that changed farmers produce food, reaper has changed 77.50 percent of respondent’s food produce.

Figure - 2: Inventions that Changed Farmers Produce Food

The reaper made it possible to harvest large fields in one day and allowed farmers to have bigger crops. Tractors have changed in 93.75 percent of respondent's food produce. No farm would be complete without a tractor or two. These machines helped farmers increase productivity, which led the way to larger farms. Combustion engines eventually replaced steam engines. This helped to decrease the size of the tractor. Because of the tractor, horses and mules were no longer necessary. This allowed farmers to sell more of their crop, instead of saving a large portion of it to feed their livestock.

Whereas thresher has changed 61.25 percent of the respondent's food produce. The invention of the threshing machine made this process much easier. The threshing machine helped speed up the process of separating grain. The invention of the steam engine increased threshing production by 100 times. Combines are a must-have piece of equipment on any large farm. This machine combines three harvesting operations. These operations include reaping, threshing, and winnowing. The inventions of Automobile led the way for the first steam and gas-powered farm wagons. These wagons helped farmers move around the farm, as well as transport livestock and equipment. Farm wagons eventually evolved into the modern day pick-up truck, which helped farmers complete chores more quickly. When pressurized fluid powers an engine, it's called hydraulics. The details of technologies for harvesting crops given in table – 4.

Table – 4
Technologies for Harvesting Crops

S.No.	Agricultural Technologies for Harvesting	Functions	No. of Households
1.	Sickles	Cutting Plant of Crops	18 (22.50)
2.	Cart	Moving Crop to Store	09 (11.25)
3.	Hand tools to separate crop from plant	Sanitizing Crops	11 (13.75)
4.	Labor force	Gathering Products	14 (17.50)
5.	Threshing machine on hire	Purifying Crops	09 (11.25)
6.	Cutting machine	Cutting Grass and fodder	06 (7.50)
7.	Power trailer on hire	Soil Grounding	13 (16..25)
	Total		80 (100.00)

(Compiled and calculated from the Field Survey –Primary Data).

This technology is used with several types of agricultural equipment. This includes hydraulic drives on tractors, self-propelled sprayers, self-propelled harvesters and truck loaders. Some believe that hydraulics is a key factor in how the agriculture industry has transformed over the years. Hydraulics reduces the amount of manual power needed and increases overall efficiency and productivity. Hydraulics also provides less downtime between agricultural operations and reduces the risk of injury.

Data shown in table - 4 explains the Technologies for Harvesting Crops. Implementation of Artificial Intelligence (AI), GPS, cloud machine learning, satellite imagery, and advanced analytics were involve the process of smart agriculture. Harvesting be one of the most important stages of agricultural and the employ of a variety of elegant strategy raises the productivity and consequently reduces the on the whole loss. The details of various technologies using for caring the crops are specified in table – 5.

Table – 5
Various Technologies Using for Caring the Crops

S. No.	Contemporary Technologies	Functions	No. of Households
1.	Cannel Irrigation	Irrigation to entire Land	12 (15.00)
2.	Compost fertilizer	Make use of manure fertilizer	10 (12.50)
3.	Herbal pesticide	Make the most of Herbs and Urine of Cattle's to Crops	07 (8.75)
4.	Removing grass	Take away by hand over	09 (11.25)
5.	Chemical pesticide	Send out substance on Crops	07 (8.75)
6.	Chemical fertilizer	Combine substance manure on Soil	11 (13.75)
7.	Pipe irrigation (Drip, sprinkle)	Irrigate merely Plant from side to side Water Pipe	09 (11.25)
8.	Tunnel vegetable farming	Vegetable Production in Plastic channel	09 (11.25)
9.	High value animal husbandry	Cow, Buffalo and Goats	06 (7.50)
	Total		80 (100.00)

(Compiled and calculated from the Field Survey –Primary Data).

Data presented in table - 5 discusses Various Technologies Using for Caring the Crops. The sampled farmers used modern farming technology to get better types of production practices. It formulates use of high yielding varieties of a single crop, scientifically superior technology and lots of energy financial assistances in the form of irrigation water, fertilizers and pesticides.

Mechanization in addition to Artificial Intelligence are the true focus of technological advances in agriculture, and it is already employed on farms around the world. The details of the basis of information gaining on contemporary technology are specified in table – 6.

Table - 6
Basis of Information Gaining on Contemporary Technology

S.No.	Kinds of Media	Sample Households	
		Numbers	Percent
1.	FM Radio	15	18.75
2.	Television	17	21.25
3.	Exposure Visits	09	11.25
4.	Market and Fair	08	10.00
5.	Neighbors	14	17.50
6.	Newspaper & Magazines	12	15.00
7.	Others	05	6.25
Total		80	100.0

(Compiled and calculated from the Field Survey –Primary Data).

Data given in table - 6 elucidated that the details of basis of information gaining on contemporary farming technologies. Overwhelming majority (21.25 Per cent) of the respondents gain the information on contemporary farming technologies with help of television advertisements. While 18.75 per cent of them gain the information on contemporary farming technologies with help of FM Radio, whereas 29.50 per cent of them were obtain information from neighbors and newspapers and its related sources. It can be stated that majority of the respondents gain the information on contemporary farming technologies with help of television advertisements.

Major Findings:

- ❖ There were 31 respondents who belonged to 25-45 years age group and 20 respondents belonged to below 25 years age group and 18 respondents belonged 45-65 years age group and rest 11 respondents belonged to above 65 years age groups.
- ❖ It is found that 42 respondents are earn up to Rs. 20,000 and 21 respondents are earn to Rs. 20,000 – 30,000 and rest of 17 respondents earn to Rs. 30,000 to 40,000.
- ❖ It is found that Occupation wise 47 respondents related to service sector and 18 respondents are professional and rest of 15 respondents related to business sector.
- ❖ It depicts that 30 percent of respondents are using Genetic manipulation.
- ❖ It is found that 77.50 percent of the respondents practicing the use of synthetic fertilizers, 93.75 percent of them using Chemical pest control, 91.25 percent are practicing Irrigation technologies.
- ❖ Whereas 96.25 percent of the respondents practicing Combination of Traditional and Modern Agricultural Methods and Technologies even today.
- ❖ Tractors have changed in 93.75 percent of respondent's food produce.
- ❖ Overwhelming majority (21.25 Per cent) of the respondents gain the information on contemporary farming technologies with help of television advertisements.

Conclusion

Contemporary technological interventions have been fostering agriculture development practices in the study area. Contemporary agricultural equipment is used to perk up the extensive kinds of production put into practice working by agriculturalists. It creates utilization of high yielding variety of a solitary crop, mechanically superior technology in addition to plenty of energy financial assistance in the appearance of irrigation water, fertilizers and pesticides. Elegant cultivation occupies the implementation of artificial intelligence, GPS, cloud machine learning, satellite imagery, and advanced analytics.

Even though, several contemporary farming equipments are practiced by the respondents in the study area there is a remarkable change in the earning capacity, savings aptitudes and spending ability of the respondents before and after using contemporary farming equipments. However, there is no outstanding change in the indebtedness aptitudes of the respondents before and after using contemporary farming equipments in the study area.

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