IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Impact Of Drone Technology On Agriculture Reference To Nadyala District Of AP

Dr. B. Ramachandra, Assistant professor, Department of Economics,

Government College (Autonomous), Ananatapur, Anantapur Dist, A.P, India.

ABSTRACT

The role of Technology spreads all over the three sectors of the economy irrespective of development levels in the world. The fruits of technology are enjoying the people. We can find the foot prints of technology in developed countries. The advancement of technology is lacking behind in underdeveloped countries and developing countries. India has been recognized ad self sufficient country in food grains due to green revolution where technology had been used. Today new technologies like digitization in Agriculture is implementing in Indian Agriculture. As a part of this drone technology is using in Agriculture which the idea is bring to drive economy in progressive path and causes to bring second revolution in Agriculture in the country. The productivity of groundnut is significantly increased after using of drone technology in selected area of Nandyala district.

Key words: productivity. Digitization, Ground nut, Drone Technology, Labour, Capital, Isoquants, Variable.

Introduction:

Change is a common phenomenon in the nature. Everything will go under change in the nature. Change is a basic requisite for creation. Change is like a seed, creation is a plat. Therefore there is no creation, without change. It is not confined to nature; it is applicable to every ideology, every concept and everything. Static is also there in Economics but, it will occur and refers a point of time only and it is the rarest of the rare thing too. Creation does not mean that the old thing is replaced by a new one. It is more than that.

It has been observed that the main cause of backwardness of under developed country is backwardness of technology. The main reason for economic backwardness is the low level of technological development in the country. A specific level of technological advancement is a precondition for rapid growth. It is, therefore, the level of technological advancement which is considered as an index of economic development. It is observed that the absence of proper technological improvement retard economic development. The UNO experts observed that unless special effort is made, the process of technological development in the UDC's will be relatively slow and the gap in technology will continue to grow wider as the cumulative scientific progress of developed countries acceleration.

The Report of United Nations conference on trade and Development emphasizes the importance of technological changes that "innovation and new technologies can contribute to eradicating poverty by raising living standards." Further it accentuated that "given the diverse, multidimensional, ambitious and absolute nature of the Sustainable Development Goals, it will be practically impossible to achieve all of them by 2030 without the development and appropriate application of science, technology and innovation."

Technology is a critical factor in economic growth. Technological change means the technical knowledge used in production of its means that are capital and labour. Technological change determines the pace of the growth by increasing productivity of labour and other production factors. Mathematically it can be expressed as

$$P = f\,(N, L, K, O, A)$$

P is Production, N represents land, L indicates labour, K represents capital and A indicates Technology and *f* represents function. We can rearrange the equation as

$$P = A\,(N, L, K, O,)$$

This expression can be shown by Cobb Douglas production fuction.

$$Q = AK^{1-\alpha}L^{\alpha}$$

$$Q\lambda = \lambda\, AK^{1-\alpha}L^{\alpha}$$

$$Q\lambda = (AK^{1-\alpha}L^{\alpha})\,\lambda$$

$$Q\lambda = Q\lambda$$

Here, λ represents a change in technology.

The equation reveals that at what rare technology changes, the volume of production also increases at the same rate. It will be happened due to increase in productivity of every production factor which used in the production processes. The technological change is simple an auxiliary factor which enables other factor's productivity as it has been preceded by many changes. Frankel assumes that the "technological change is not a mere improvement in the technical knowhow. It means much more than this. It should be preceded

by sociological change also, a willingness and desire on the part of community to modify their social, political and administrative institutions so as to make them fit with new techniques of production and faster tempo of economic activity."

According to Bhabha "what the developed countries have and under developed lack is modern science and economy based on modern technology. The problem of developing, underdeveloped countries is therefore the problem of establishing modern science in them and transforming their economies to one based on modern science and technology."

J. A. Schumpeter emphasized on innovations greatly. Innovations can be in form of discovery and technological progress which determines autonomous investment. Therefore,

$$Ia = f(D, T)$$

Ia indicates autonomous investment, D represents discovery, T indicates technological progress and *f* represents function.

The technological progress and discovery depends on the supply of entrepreneurs whose main function is to carry innovations in form of discovery and technological progress.

The main focus of developing countries and underdeveloped countries is get hold of economic development. According to Kindle Berger, "economic growth means more output and economic development implies more output and changes in the technical and institutional arrangements, by which it is produced".

Technological progress and economic development are truly related to each other. The level of technological advancement determines the level of economic progress. Rapid economic growth can be achieved through high level of technological advancement. All developed countries are technologically advanced countries and backward it in undeveloped countries.

The aim of the Technological advancement is not confined to bring more output with the same level of resource utilization, but also obtain same level of output with low level of resource utilization. It can be expressed mathematically as

$$(L+K+T) = P \ldots.1$$

Labour (L), Capital (k) are reduces and Technology (T) increased, then

$$(L-\Delta l)+ (K-\Delta K)+ (T+\Delta T) = P + \Delta P \ldots\ldots.2$$

To find change subtract equation 1 from equation 2, then we get

$$-\Delta L - \Delta K +\Delta T = \Delta P \ldots..3$$

$$-\Delta L - \Delta K +\Delta T = 0 \ldots.. \ 4$$

$$-\Delta L - \Delta K \ = \Delta T \ldots\ldots5$$

The 5 reveals that a change (negative) of labour and capital is equal to a change (positive) in technology. Therefore the output does not change. In the case of one factor (L) is variable then,

$$-\Delta L + \Delta T = \Delta P \ldots 6$$

$$-\Delta L + \Delta T = 0 \ldots\ldots 7$$

$$-\Delta L = \Delta T \ldots\ldots 8$$

Similarly,

$$-\Delta K + \Delta T = \Delta P \ldots 9$$

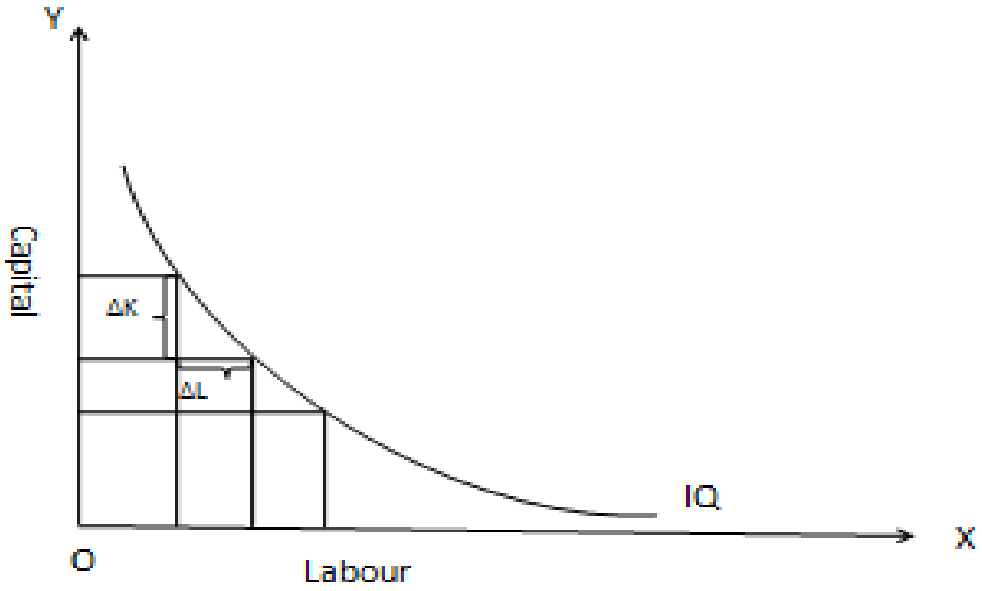
$$-\Delta K + \Delta T = 0 \ldots\ldots 10$$

$$-\Delta k = \Delta T \ldots\ldots 11$$

This can be explained by isoquants curve.

Figure No.2

Impact of Technology on production



The figure has explained that either capital (K), if labour (L) is constant or change negatively other if labour (L) is reduced at capital constant the output is constant as isoquants curve (IQ).

Agriculture is the backbone of underdeveloped or developing economies like India. The advent of technology in agriculture has brought paradigm shift in Indian economy. H. L. Sharma identified that “agriculture and allied sector has long been the cornerstone of the Indian economy, contributing significantly to national income, employment generation, foreign exchange earnings and rural development”. We can see the contribution of agriculture and allied in percentile to the country’s gross value added in below table.

Table No.01

Share of agriculture and other sectors in GVA

(At current prices)

Sl. No.	Year	Agriculture and allied sectors	Non-Agriculture
1	2011-12	18.53	81.47
2	2012-13	18.20	81.80
3	2013-14	18.59	81.41
4	2014-15	18.20	81.80
5	2015-16	17.72	82.28
6	2016-17	18.04	81.96
7	2017-18	16.28	83.72
8	2018-19	17.64	82.36
9	2019-20	18.32	81.68
10	2020-21	20.35	79.65
11	2021-22	18.95	81.05
12	2022-23	18.05	81.95
13	2023-24	17.79	82.21

Source: National Statistics Office, MoSP, 2024

It is undoubtedly witnessed the table (No.1) that the contribution of agriculture to GVA is rages from 16.28 per cent to 20.35 per cent during the given period. However, most of the periods, the sector has contributed around 18 per cent to GVA. Of course, this is less than world average and it is very far to the value of the contribution of non-agriculture sector. Neelam Patel explained Indian agriculture scenario that the agriculture sector employees 42.3 per cent of Indian work force and contribute around 18.2 per cent to the country's GDP. However the sector faces challenges like low productivity, high dependence on monsoons, small land holdings, post harvest losses and volatility in farm incomes. Nearly 89.4 per cent of farmers own less than 2 ha of land. Crop yielding are 20 to 60 per cent lower than global average. Despite, the contribution of this sector in developing countries' are more than that of developed nations' contribution. There is a need to get second revolution in agriculture in developing countries.

Digitization in agriculture:

Jagadeep saxena pointed out that "the globally acclaimed green revolution during 1960s transformed Indian agriculture from conventional animal-based subsistence farming to energy intensive chemical-based progressive agriculture." Over the year, digitization in agriculture in the country (India) has evolved from the basic information to more advanced integrated system. Today the attention paid on real time monitoring, data-drive planning, modern technology and strong supporting system. The digital agriculture which we predict to bring the next Agrirevolution is essential for promoting smart farming practices. The smart farm digitization refers to the direct deployment of digital technologies at the farm level which enable farmer to make data-based decisions and manage their fields with precision. Drones are one of such digital technology which are practicing today in varies countries the world.

Review of literature:

Kute, S.R (1991) conducted a study on impact of new agriculture technology on productivety of certain crops in marathwada. The researcher compared the productivity of certain crops in pre green revolution(1951-52 to 1964-65) and post green revolution periods(1967-68 TO 1986-87). The researchers found that the productivity of rice, wheat, jowar, bajra sugarcane, cotton and groundnut were significantly increased in post green revolution period where water and chemical fertilizers were used.

Verma, Dinesh Kumar(2004) conducted a study on the use of modern technology and its impact on farm production and income in Agra District of Uttara Pradesh, based on farm size groups. The researcher found that the production in small size groups is comparatively more than big size farm group. He studied the cost under different farm size groups. He found that the cost was inversely related to farm size.due to use of new technology in agriculture in the selected area.

Many research works have confirmed that the productivity of crops is undisputedly increasing due to use of new technology in agriculture particularly mechanization of agriculture, use of chemical fertilizer. In the stream of time many changes have been taken place in agriculture. The advent of digital technology has taken the paradigm change the agriculture all over the world. The developing countries like India is somewhat backward than developed countries. Though new technologies has envisaged changes in agriculture no research programme has done on the impact of drone technology on agriculture due to farmers are adopting this kind of technology today in India particularly in Nandyala district of the state of Andhra Pradesh.

Objective:

1. To study the productivity of groundnut in the nandyala district of AP

Hypothesis:

1. The productivity of groundnut is similar even after the adoption of drone technology.

Methodology:

The Nadyala district is divided into revenue divisions namely Nandyal, Dhone (Dronacham) and Atmakur. For sampling, 100 respondents who are using drone technology are selected randomly from three revenue division. The analysis is done based on primary data. The inference is constructed on paired t-test.

Data analysis:

The primary data which have collected related to productivity of groundnut crop by schedules from 100 respondents from three revenue divisions of Nadyala district in before and after using of drones are compiled in below table.

Table No.02

Productivity of groundnut in Nadyala district

(In quintals)

Sl. No.	Proclivity	
	Before	After
1	45	70
2	50	72
3	54	75
4	58	80
5	60	82

Source: Primary data

The values in the table (Table No.02) are averages of each value in the two periods. It is clear that the farmers who obtained 45 quintals before using drones are got 70 quintals after using drones for spraying pesticides and fertilizers and precautions with the help of drone technology. Remaining values in the table are also obtained in the similarmanner.

Hypothesis testing:

Hypothesis testing is occupied an important role in the research which helps the researcher in determining that whether the null hypothesis is significant or not at certain significant level.

Table No03.

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	After - Before	22.40000	1.51658	.67823	20.51692	24.28308	33.027	4	.000

The calculated p value at 95 per cent confidence level is much lower than the 0.05 per cent of table value of p. Therefore, the null hypothesis is rejected and accepted that the difference of productivity is significant with degree of 3.

Table No.04

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	After	75.8000	5	5.11859	2.28910
	Before	53.4000	5	6.06630	2.71293

The table (table No.04) ascertains that the difference in productivity of groundnut in three revenue divisions of Nayala district, between before and after using of drone technology. the mean value of the crop is much more than the mean productivity before using of drone technology. The inference emphasizes that the drone technology is worked out in increasing productivity of groundnut in the selected area.

Conclusion:

It is concluded that the digitization of agriculture is undoubtedly enhances the productivity of crops and it is very useful tool which drive the country towards development economies.

Reference:

1. Allen, RDG: "*Mathematical Analysis for Economists*", Macmillan & CO, Limited London, 1938.
2. Cobb-Douglas: "*a Theory of Production*", the American Economic Review, Vol.18, No.1, 1928. pp.139-165
3. Joseph A Schumpeter: "*The theory of Economic Development"* Cambridge, Massachusetts, Harvard University Press, 1934.
4. Jagadeep Saxena (2025) "Conservation Agriculture practice and perspectives,"Kurukshetra,August, 2025, P.P.11 -15
5. Kute, S.R.(1991)"Impact of New agricultural technology on productivity of certain crops in Marathwada, "Ph.D thesis, Dr Babasaheb Ambedkar Marathwada University
6. Neelam Patel and Paremal Banafarr (2025) "Agriculture 4.O Towards Agri-Tech Revolution, " Kurukshetra,August, 2025, P.P.5-10
7. Report of the Secretary-General The impact of rapid technological change on sustainable development.2025
8. Verma, Dinesh Kumar (2004) 'A Study on the using of modern Technology and its inputsmon farm production and Income in Agra district of Uttara Pradesh" Ph.D thesis, Dr.B.R. Ambedkar University, Agra.

.