

## AI TECHNOLOGY FOR AGRICULTURE SECTOR SUSTAINABLE GROWTH IN AGRICULTURAL SECTOR WITH THE USE OF AI TECHNOLOGY IN JALGAON DISTRICT

**Parag Gulabchand Jain** FCA, FAFD, DISA, JAIIB, M.Com, Pursuing Ph.D. from The Kavayitri  
Bahinabai Chaudhari North Maharashtra University, Jalgaon

**Dr. Neelima Prashant Warke** Godavari Institute of Management & Research

E-mail id: - [pgjain2007@gmail.com](mailto:pgjain2007@gmail.com)

### 1. Abstract:-

**Purpose-** To study about the Sustainable Growth in Agricultural sector with the use of AI technology in Jalgaon District.

**Findings-** Lesser use of AI technology among larger population in agriculture sector in Jalgaon District.

**Limitations-** Lack of awareness of AI technology, benefits of using it and its costs.

**Practical Implications-** Government should with the help of private Institutions should develop affordable AI technology and spread awareness campaign among public.

**Value-** To achieve the target of sustainability 2030, Government along with public and private both should join hands with each other.

### Introduction:-

long lasting is the simple meaning of Sustainable. Sustainable protects Environmental, Social and Governance factors. AI means artificial intelligence. AI technology is the latest technology which is gaining larger acceptance and use in various sectors across the world.

In automobile sector with the help of AI technology manufacturing and testing of new vehicles are done. Also, in various other industries use of AI technology has started. Even in pharma sector operations are done by robots.

Though agriculture sector is least developed compared to other developed countries, still many companies in Jalgaon district are doing research and development. Their research standard is ranked to global scale basis.

Author studied the use of AI technology for agriculture sector in Jalgaon District.

### Profile of Jalgaon agriculture sector:-

The earlier part of Khandesh now known as Jalgaon is located in the north part of Maharashtra state. It is connected through high trafficked National Highway number 6 - Surat to Kolkata. British Government ruling on India was facing shortages of cotton because of the American Civil war has developed and start Railway from Busawal to Mumbai. Bhusawal is part of Jalgaon district, is a junction of Railway. Jalgaon district connected to all parts of railway lines. There was a dry port at Bhusawal. Jalgaon has an Airport. Transportation connectivity facility was very good.

Jalgaon is the only one Municipal corporation in India having its own 17 floor building and many complexes built up. Girna, Tapi, Bori, Panjara and Waghur these rivers flow from Jalgaon district. Cotton and Banana are the main agricultural crops in Jalgaon district. Pulse mills and gold shops in Jalgaon district are famous across India.

Sangita G Patil in her thesis (2016) on "A study of problems of small scale Industries in Jalgaon District" outlined though about 67% of the total income is generated out of the agriculture, still agriculture sector in Jalgaon district is under developed.

### Preamble to Topic:-

Jalgaon is having very well resources, different type of connectivity to the all parts of India still its agricultural sector has not growth on large scale basis and it lags behind in use of latest technology on broader scale. It must have grown very faster compared to other surrounding districts. In industrial sector, 40 years ago there was no Airport, Railway and Water Dam in Aurangabad, still today Aurangabad has developed rapidly compared to Jalgaon in Industrial growth.

Growth of any country is measured in terms of its Gross Domestic production (GDP). Economic survey published by Govt of India, “during 11th plan India’s GDP was 8% but Agriculture GDP was 4.10%”. It shows that agri GDP is very less than overall GDP.

### **Relevance of the Study: -**

In Jalgaon district Jain Irrigation systems Ltd is working for the growth of farmers and on the principles of late Padmashri Dr.Bhavarlal ji Jain “Leave this world better than you found it”.

Jain Irrigation systems Ltd has organized for farmers of India on “Agricultural Technologies Awareness Month” at Jain Hills, Jain Agri Park, Shirsoli, Jalgaon from Feb to March,23. Objective was “To experience and learn from live demonstration of Hi-Tech Agricultural practices, Precision Farming Technologies & Superior Planting Material”.In the event company has exhibited various types of company developed technology, its products for agriculture farming and processing of crops. Jain Irrigation systems Ltd has arranged exhibition on “हायटेक शेतीचा नवा हुंकार” in the month of Dec,2023 updating to farmers about latest practices of agriculture farming and processing of crops.

Jain Irrigation systems Ltd arranged exhibition in the month of Feb,24 to Mar,24 “Echelon 2024” for the benefit of farmers and Dealers across India.

New Agriculture university was announced for Jalgaon district was not approved by Government of Maharashtra till this date. Governments approach for spreading awareness of latest technology among stakeholders of agriculture sector needs to be improved aggressively.

Latest name of some of the Cyclone which hits the India are Dana,Asna, Remal Biparjoy,, Sitrang, Mandous,Asani, Jawad,Yaas,Tauktae etc. Thogh it is not in the hands of anyone to control them but Government should with the help of use AI can predict the same in advance and spread awareness among all farmers and public so they can take necessary precautions to protect their agriculture produce.

After hitting the cyclone or any natural calamity there is procedure of survey of field of agriculture crop for passing of insurance claim. In Jalgaon district survey was delayed very much and farmers were complaining about wrong rejection of their claim. With the use of drone Insurance company should make first radial survey immediately after any incidence without waiting for claim. Thereafter they should use AI based software to calculate quantum of loss and pass the claim accordingly.

Government has developed websites and app for showing market demand and rate for different agriculture produce. On the same ground Government should developed websites and app using AI Technology showing area wise types of soil fertility of land, availability of water nearby, atmospheric conditions and which crop can be taken on such land and suitable period of sowing and all other activities etc. This will help agriculture sector on broader sense to take maximum crop with lesser loss giving them increase in the yield.

### **Review of Literatures:-**

#### **Conferences/Seminars attended (Table no.1)**

| Sr.No. | Date       | Days | Title  | Conducted by  | Outcome  |
|--------|------------|------|--|---------------|--|
| 1      | 01.01.2021 | 1    | India's 1st Virtual processed food R & D Expo 2021   | MOFPI & FICCI | Brain warming session on Research & Innovation on food Industry  |
| 2      | 31.10.2021 | 1    | Role of CA in changing Economic scenario for members in Industry and for members in practice | ICAI          | The learned speaker has explained present economic situation in the India and the scope for increase of development of economy |

|    |                          |         |  |  |   |
|----|--------------------------|---------|--|--|---|
| 3  | 10.12.2021               | 1       | MSME trade   | Vibrant India Economic Council & National Small Industries Corporation Ltd | comes to know the trend of industries registered as MSME  |
| 4  | 17.02.2022               | 1       | Research paradigm-Design and execution of Quality research in Management | Godavari Institute of Management & Research                                | to help in learning and developing  |
| 5  | 12.05.2022               | 2       | Technical Reviewers and FRRG Members                                     | ICAI   | knowledge on what and how to interpret the subject  |
| 6  | 01.02.2023               | 23      | Agricultural Technologies Awareness Month                                | Jain Irrigation systems Ltd  | interacts with farmers and technical team of organizer to understand various aspects of agriculture farming and processing of crops.                              |
| 7  | 22.01.2023               | 1       | startup SAMVAD   | ICAI jointly with KBCNMU   | understand the concept of startup, its role and facilities offered to new entrepreneur or to the business person to start new business                            |
| 8  | 01.02.2023               | 1       | 10 <sup>th</sup> Indian Alternative Investments Summits 2023             | Equalifi   | interact with successful Industrial leaders, share their experience with audience, to know various alternative type of financing and Investment in the Industries |
| 9  | 27.12.2023               | 1       | “हायटेक शेतीचा नवा हुंकार ”  | JISL   | Get to know updation of technology in agriculture farming   |
| 10 | 14.02.2024 to 15.03.2024 | 1 month | “Echelon 2024”   | JISL   | Interact with farmers, Manufacturers and others to review secondary data along with primary data.   |

### Reviewed Literature-

- 1) Sangita G Patil in her thesis (2016) on “A study of problems of small scale Industries in Jalgaon District”
- 2) Chintan Environmental Research and Action Group in their article “Food waste in India” Arunabha Ghosh & Nandini Harihar on Dated 20.03.2022 written an article in Financial Express on sustainable finance (Website: [https:// www.financialexpress.com/ opinion/making-india-a-hub-of-sustainability-financing/ 2381551/](https://www.financialexpress.com/opinion/making-india-a-hub-of-sustainability-financing/2381551/)) on topic “Making India a hub of sustainability financing”. They have given details of sustainability and finance for development of green energy.
- 3) Ashima Obhan & Shuchi Dutta in their paper on “India: Sustainable Finance And India's Climate Goals” Dated 12.10.2021 emphasize on the importance of renewable energy.

- 4) G. R. Arikkanth(2006),in his Thesis “Legal complexities surrounding Food Safety and Standards Act 2006 – A special reference to Manufacturing Companies' ', gives focus on legal complexities governing quality of foods.
- 5) Battu Preethi,GK Sasane and Sonali Yashwant Gadmale in their published paper emphasized on agriculture crop grape.
- 6) CAG India has in their published report (part 6 in 2017) on Maharashtra state “Report of the Comptroller and Auditor General of India on General and Social Sector” focused on audited report and shortcomings of government departments.
- 7) Gov. of India in their survey report (2016) “State of Indian Agriculture 2015\_16” given analysis of the recent growth & performance of agriculture and allied sectors and also the major emerging challenges.
- 8) In the JMC websites on their survey report “City Development Plan-Jalgaon (Draft) under UIDSSMT”, mentioned Agriculture base data, working population and employment details.
- 9) Keshav Prakash Dandage (2018) “Development Traceability Systems for Agricultural products in India” has mentioned overall pictures of agricultural products scenario in India.
- 10) Vinay Vaish and Urmi Chudgar,(13th June, 2013), on “LinkedIn Connections” in their article on “India: Laws Governing The Food Industry in India-Revisited’ gives importance of food processing Industry in India, applicable various laws governing the food Industries and the failure of the existing laws.

### **Research Methodology:-**

Research Methodology of the Thesis is as given below

### **Objective of the Study: -**

- a. To study the agriculture activities in Jalgaon district from the angles of use of AI Technology.
- b. To evaluate role of AI Technology in the Growth of agriculture sector in Jalgaon district.

### **Importance of the Subject:-**

- a. Chintan Environmental Research and Action Group in their article “Food waste in India” refer UN report that India has sufficient food production but 190 million’s Indian remain undernourished on the other side every year nearly 92,000 crores food wasted in India which is enough to face undernourishment.
- b. The above figure of losses highlights the importance of agriculture sector in removing of hunger. In this area AI technology can be used effectively and efficiently.
- c. AI Technology in long term saves costs and improve profitability of agriculture sector.

### **Hypothesis**

Reasonable prediction terms as hypothesis. Following hypothesis has been predicted

Hypothesis 1:- AI technology are effective or not in agriculture sector

Hypothesis 2:- whether AI technology are used in agriculture sector in Jalgaon district

Hypothesis 3:- Effectiveness of AI technology in use in agriculture sector in Jalgaon district

### **Questionnaire**

#### **Section 1: Respondent Profile**

**Name of Respondent:** \_\_\_\_\_

**Designation:** \_\_\_\_\_

**Qualification:** \_\_\_\_\_

**Department:** \_\_\_\_\_

**Experience (in Number of Years):** \_\_\_\_\_

#### **Section 2: Profile**

**Name of Organisation:** \_\_\_\_\_

**Since how many years you are in this business (In Years)** \_\_\_\_\_

**Type of Agricultural activities :** a) Trading b) Farming c) Food processing d) others, if any

**Type of agricultural products**

- a) Grain/Cereals
- b) Fruits and vegetables
- c) Dairy
- d) Meat/poultry/fish
- e) Bakery & confectionary
- f) Others

If Others, please specify: \_\_\_\_\_

**Activities Located in area :**

- a) Rural
- b) Suburban
- c) Urban

**Have you known about AI technology**

- a. Yes
- b. No

**How would you rate the clarity of the AI Technology in your agriculture sector in Jalgaon District?**

- a) Very clear
- b) Somewhat clear
- c) Neutral
- d) Somewhat unclear
- e) Very unclear

**How much understanding about AI Technology**

- a) Basic
- b) Primary
- c) Nothing
- d) Advanced

**Whether use AI Technology in your agriculture sector**

- I.Sometime
- II.Never
- III.Regular
- IV.Always

**How you describe the overall use of AI Technology in agricultural sector**

- I. Very simple
- II. Simple
- III. Normal
- IV. Difficult
- V. Very difficult

**Whether use of AI Technology in agriculture sector is useful or not**

- a) Most useful
- b) Sometime useful
- c) Not useful at all
- d) Less useful

**What you recommend for effective utilization of AI Technology in agriculture sector**

**Tools**

**Primary data**

Objective of the research are achieved with the help of Qualitative and quantitative data. Structured questionnaire method is used for data collection. Primary data is collected based on structured questionnaire developed. Questionnaire has been asked to the businesses, farmers, industrialists and experts working in agriculture sector.

**Secondary data**

Secondary data has been collected from the various Government and non-Government reports published, Journals, newspapers, books published, thesis on relevant subjects etc.

**Data collection**

Primary Data has been collected from the interview of 2317 who are working in agricultural sector.

**Analysis and findings**

Data analysis is centric part of research study. It is observed that private companies if focusing on development of latest technology for agriculture sector but Government is lacking in providing direct and open support for development of AI technology and use of it in agriculture sector.

There are 3 type of Agricultural activities like farming, Trading, and Food processing. Types of agricultural products process in Jalgaon district are as under

- g) Grain/Cereals
- h) Fruits and vegetables
- i) Dairy
- j) Meat/poultry/fish
- k) Bakery & confectionary

Agricultural activities of farming are done in rural area and suburban area. Food processing activities done in urban areas.

In the farming activities, larger portion of farmers having small area of land and with insufficient funds unable to use latest AI technology. Remaining farmers having funds and bigger size of lands have little knowledge of AI technology. They are using AI technology on some extent thanks to the private players and Government for promoting of AI technology base products. They are using AI technology products without knowing that in that products AI technology has been used.

Peoples used mobile phones, laptop, computer and software for knowing the information of latest rate of various agriculture products, weather conditions, for online trading etc.

Very few food processors among big food processing industries used AI Technology more than others. They have larger level of clarity about it.

Though they are using AI technology but there thinking is that just it is one of the tools which help them in their activities.

Some of products having AI Technology is useful on daily basis and some are fortnight. For the people who is using AI technology are happier and satisfied because their time, money and requirement of manpower is saved. But the persons who don't know about it feels its very much difficult for them to handle it. There fear hold them back in using it.

AI technology has increased production capacity, helps in saving costs and gaining popularity very slowly.

**Conclusions**

AI technology is cost effective in long term but from the angle of public at large it is costly and they don't have sufficient support from the Government. For achieving a sustainable target 2030, mere projections and seminars are not sufficient. Government should increase incentives on the AI technology products. With the joint efforts and co-operation of Public and private, Government must encourage for development and use of AI Technology for agriculture sector to achieve the same.

**Recommendations**

On the basis of free trade zone, Government should announce AI Technology zone and invite all to participate and invest in it for development of AI technology and in turn offer them 100% tax free. This will increase investment and start a new area of innovations in the area of agriculture sector.

Award should be given to the best innovative solutions of AI technology for agriculture sector.

**References/Bibliography:-**

1. Newspapers and e-newspaper – Lokmat, Sakal, Divya Marathi
2. C.R.Kothari (2006), Research Methodology, Methods & Techniques, second revised edition, New Age International Publication, New Delhi.
3. Google search engine
4. Economic Survey 2022 by Ministry of Finance, Govt of India

5. [https://www.business-standard.com/article/current-affairs/maha-footfalls-down-at-ajanta-ellora-other-tourist-sites-in-2021-121122300202\\_1.html](https://www.business-standard.com/article/current-affairs/maha-footfalls-down-at-ajanta-ellora-other-tourist-sites-in-2021-121122300202_1.html)
6. <https://www.startupindia.gov.in/content/sih/en/government-schemes/sustainable-finance-scheme.html>
7. [https://www.in.undp.org/content/india/en/home/presscenter/pressreleases/Department\\_of\\_Economic\\_Affairs\\_Ministry\\_of\\_Finance\\_and\\_UNDP\\_India\\_launched\\_the\\_Sustainable\\_Finance\\_Collaborative\\_for\\_promotion\\_of\\_sustainable\\_finance\\_in\\_India.html](https://www.in.undp.org/content/india/en/home/presscenter/pressreleases/Department_of_Economic_Affairs_Ministry_of_Finance_and_UNDP_India_launched_the_Sustainable_Finance_Collaborative_for_promotion_of_sustainable_finance_in_India.html)
8. Ashima Obhan & Shuchi Dutta has written paper on “India: Sustainable Finance And India's Climate Goals”
9. <https://www.financialexpress.com/opinion/making-india-a-hub-of-sustainability-financing/2381551/>
10. State of Indian Agriculture 2015-16 by Ministry of Agriculture & farmers welfare, Department of agriculture, Cooperation & farmers welfare Directorate of Economics & statistics, New Delhi