*Original Research Article……..*

**International Journal of Agricultural Invention**

**(online available at www.agriinventionjournal.com)**

***International Journal of Agricultural Invention* 11(1): 97-101: January-June, 2026**

**ISSN: 2456 – 1797 (P)**

# Impact of Agricultural Technology Information Centre on beneficiaries in Marathwada region

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**ARTICLE INFO**

**Original Research Article**
Received on February 28, 2026
Revised on March 08, 2026
Accepted on March 29, 2026
Published on April 05, 2026

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**PUBLICATION INFO**

International Journal of Agricultural Invention (IJAI)
**RNI:** UPENG/2016/70091
**ISSN:** 2456-1797 (P)
**Vol.:** 11, **Issue:** 1, **Pages:** 97-101
**Journal Homepage URL**
*http://agriinventionjournal.com/*
**DOI:** 10.46492/IJAI/2026.11.1.15

**ABSTRACT**

The present study assessed the impact of the Agricultural Technology Information Centre (ATIC) on its beneficiaries in the Marathwada region of Maharashtra during 2021-22. A total of 180 beneficiaries were selected using an ex post facto research design to evaluate the effectiveness of ATIC services in enhancing agricultural knowledge, decision-making, and livelihood outcomes. The findings revealed that socio-economic and communication variables played a significant role in determining the impact of ATIC interventions. Path analysis indicated that annual income, educational status, social participation, training exposure, and access to information sources exerted a strong direct and indirect influence on the overall impact of ATIC services. In the absence of these critical factors, the effectiveness of independent variables in influencing beneficiary outcomes was considerably reduced. The study highlights the pivotal role of ATIC as a single-window delivery system for technology dissemination, diagnostic services, and need-based advisory support to farming communities. Strengthening farmer capacity through targeted training, improved information access, and enhanced participation can substantially increase the effectiveness and outreach of ATIC interventions in the region.

**KEYWORDS**

ATIC, Impact Assessment, Path Analysis, Agricultural Extension, Advisory Services, Marathwada, Farmer Empowerment

**HOW TO CITE THIS ARTICLE**

Kausadikar, K. D., Kadam, R. P., Deshmukh, P. R., Kapse, P. S., More, S. S. (2026) Impact of Agricultural Technology Information Centre on beneficiaries in Marathwada region, *International Journal of Agricultural Invention*, 11(1): 97-101. DOI: 10.46492/IJAI/2026.11.1.15

The Role of ATIC in Modernizing Indian Agriculture the Agricultural Technology Information Centre (ATIC) plays a fundamental role in the Indian agricultural sector, which remains the backbone of the nation's economy by providing employment, food security, and ecological stability. Despite employing over two-thirds of the Indian workforce, a significant disparity exists between "information-rich" and "information-poor" farming communities. Agricultural extension education seeks to bridge this divide by transferring the latest scientific advancements from research institutions directly to the field. Central to this mission is the Research-Extension-Farmer (R-E-F) linkage, a vital framework ensuring that productivity and sustainability improvements are driven by well-informed and adequately trained practitioners. Bridging the Gap through Technology and Innovation in the current information age, the transition from traditional farming to modern, data-driven practices is essential. Timely and accurate information is the primary catalyst for improving extension services and overcoming the limitations of older technology transfer models.

To address these needs, the National Agricultural Technology Project (NATP) was established under the Indian Council of Agricultural Research (ICAR) with support from the World Bank. The creation of ATIC under this project introduced a collaborative "single-window" delivery system, moving beyond isolated research efforts to offer a comprehensive suite of services and products to the farming community. Impact at VNMKV Parbhani As part of this national initiative, ICAR established an ATIC at VNMKV Parbhani in 2001. This center serves as a critical resource hub for the Marathwada region and beyond, providing essential diagnostic services such as soil and water testing, plant protection, and access to high-quality seeds and planting materials. Furthermore, the center facilitates knowledge transfer through technical literature and visual aids. This interactive environment not only empowers farmers but also provides the university with the feedback necessary to develop innovative technologies that address real-world agricultural challenges.

## Materials and Methodology

The primary data collection tool for this study was a structured interview schedule, specifically designed to align with the research objectives and capture detailed insights from the Marathwada region. The development process involved a comprehensive review of relevant academic literature, coupled with expert consultations involving the research guide and specialists in agricultural extension education. To ensure the reliability of the data, the schedule was meticulously screened to eliminate biased inquiries or contradictory logic. It was drafted in Marathi, using clear and accessible language to facilitate easy comprehension for the respondents. The instrument focused on identifying the personal characteristics of the participants to determine how these variables correlate with the effectiveness of ATIC services and the operational constraints faced by the beneficiaries.

## Materials and Methodology

The study utilized a multi-stage sampling design to systematically identify and select respondents. The selection process was conducted through the following four phases:

### Stage I: District Selection

From the eight districts comprising the Marathwada region of Maharashtra, Parbhani and Hingoli were purposively selected. These locations were chosen based on having the highest density of ATIC beneficiaries.

### Stage II: Taluka Selection

Within each selected district, three talukas showing the highest engagement with ATIC were identified. These included Parbhani, Purna, and Manwat in the Parbhani district, and Hingoli, Basmat, and Aundha in the Hingoli district.

### Stage III: Village Selection

In each of the six selected talukas, three villages were purposively chosen using beneficiary records provided by the Agricultural Technology Information Centre (ATIC) at Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani. This resulted in a total of 18 villages included in the study.

### Stage IV: Respondent Selection

To ensure a representative sample, ten ATIC beneficiaries were randomly selected from each of the 18 villages. This culminated in a total sample size of 180 respondents, providing a robust data set for the final analysis.

## Results and Discussion

### Path Analysis showing the Effects of Demographic Profile of ATIC Beneficiaries with Overall Impact of ATIC

The coefficient of correlation of the data presented earlier illustrated relationship between independent and dependent variables in presence of all other variables, which are normally operative in real life situation. The relationship exhibited by correlation study may undergo change in different situations, where some of the independent variables may not exist in the environment or they may be concealed. In order to know the influence of independent variables both directly, as well as, through other variables, the correlation coefficient values indicated earlier were attempted for path analysis.

**Table 1. Path analysis showing the effects of demographic profile of ATIC beneficiaries with overall impact of ATIC**

| S. N. | Independent Variables | Total Effect | Direct Effect | Total Indirect Effect | Substantial Indirect Effect | |
|---|---|---|---|---|---|---|
| | | | | | 1 | 2 |
| X1 | Age | 0.4209 | 0.0246 | 0.3963 | 0.0102 (X9) | 0.0083 (X6) |
| X2 | Education | 0.7736 | 0.1237 | 0.6499 | 0.0943 (X9) | 0.0855 (X6) |
| X3 | Family size | 0.3405 | 0.0248 | 0.3157 | 0.0039 (X2) | 0.0022 (X12) |
| X4 | Occupation | 0.5095 | 0.0258 | 0.4837 | 0.0018 (X12) | 0.0016 (X7) |
| X5 | Land holding | 0.5256 | 0.0345 | 0.4911 | 0.0033 (X12) | 0.0026 (X2) |
| X6 | Annual income | 0.8316 | 0.1337 | 0.6979 | 0.1053 (X9) | 0.0963 (X5) |
| X7 | Farming Experience | 0.4009 | 0.1175 | 0.2834 | 0.0038 (X9) | 0.0036 (X6) |
| X8 | Social participation | 0.4743 | 0.0679 | 0.4064 | 0.0582 (X2) | 0.0311 (X12) |
| X9 | Source of information | 0.9641 | 0.6150 | 0.3491 | 0.4847 (X6) | 0.2972 (X5) |
| X10 | Scientific Orientation | 0.7265 | 0.1648 | 0.5648 | 0.0448 (X9) | 0.0437 (X6) |
| X11 | Economic motivation | 0.3261 | 0.0198 | 0.3063 | 0.0003 (X9) | 0.0002 (X6) |
| X12 | Training received | 0.9236 | 0.0337 | 0.8899 | 0.0311 (X9) | 0.0286 (X6) |

**Total Effect**

It was observed from table 1 among the profile of ATIC beneficiaries the highest positive total effect on impact of MGNREGA on its beneficiaries was exerted by source of information (0.9641), followed by training received (0.9236), annual income (0.8316), education (0.7736), scientific orientation (0.7265), land holding (0.5256), occupation (0.5095), social participation (0.4743), age (0.4209), farming experience (0.4009) and family size (0.3405), whereas economic motivation (0.3261) exerting low positive total effect on overall impact Agricultural Technology Information Centre on its beneficiaries. It means that total of the direct effect and indirect effect exerted by all independent variables on overall impact of ATIC.

**Direct Effect**

It was noticed from table 1 that, the highest direct positive influence on impact of ATIC on its beneficiaries was exerted by source of information (0.6150), followed by scientific orientation (0.1648), annual income (0.1337), education (0.1237), farming experience (0.1175), social participation (0.0679), land holding (0.0345), training received (0.0337), occupation (0.0258), family size (0.0248), age (0.0246) and economic motivation (0.198). It means that association of one independent variables i.e. source of information with other independent variables of the indirect paths specified in the model.

**Total Indirect Effect**

It was observed from table 1 that, the highest total indirect positive influence on overall impact Agricultural Technology Information Centre on its beneficiaries were exerted by training received (0.8899), annual income (0.6979), education (0.6499), scientific orientation (0.5648), land holding (0.4911), occupation (0.04837), social participation (0.04064), family size (0.0248), age (0.03963), source of information (0.3491) family size (0.03157) and economic motivation (0.3063) whereas, farming experience (0.2834) exerting low

positive total indirect effect on overall impact Agricultural Technology Information Centre on its beneficiaries. Total indirect effect means association of one independent variable i.e. training received with other mediated through the other variable in the model it computed as the product of path linking variable.

**Substantial Indirect Effect**

As regards substantial indirect effect table 1 observed that, the highest first substantial indirect positive influence on overall impact Agricultural Technology Information Centre on its beneficiaries were exerted by source of information (0.4847) through annual income, annual income (0.1053) through source of information, education (0.0943) through source of information, social participation (0.0582) through education, scientific orientation (0.448) through source of information, training received (0.0311) through source of information, age (0.0102) through source of information, family size (0.0039) through education, farming experience (0.0038) through source of information, land holding (0.0033) through training received, occupation (0.0018) through training received economic motivation (0.0003) through of information.

The data in the table 1 observed that, highest second substantial indirect positive influence on overall impact agricultural technology information centre on its beneficiaries were exerted by source of information (0.2972) through land holding, annual income (0.0963) through land holding, education (0.0855) through annual income, scientific orientation (0.437) through annual income, social participation (0.0311) through training received, training received (0.286) through annual income. Considerable, substantial indirect positive effects were also exerted by age (0.0083) through annual income, farming experience (0.0036) through annual income, land holding (0.0026) through education, family size (0.0022) through training received, occupation (0.0016) through farming experience, economic motivation (0.0003) annual income. Thus, it was observed that education, land holding, annual income, source of information, scientific orientation and training received were important variable in the absence of which, independent variable are not able to influence the overall impact of agricultural technology information centre.

These findings were supported by (Adsul, 2016, Deshmukh, 2016, Dhulgand, 2020 and Nair, 2021).

**Conclusion**

The path analysis findings shows that source of information, training received and annual income had maximum total effect. The source of information followed by training received had maximum first substantial indirect effect and annual income, land holding and training received had maximum second substantial indirect effect. Increase the frequency of visits in rural area and distribute more literatures about technologies among the farmers during the visits as well as through effective social media it will help to get more information about advanced technology and provide the various trainings and intervations at village levels also. Honarary and monetory benefits have been given to the progressive beneficiaries who effectively used services for the development of their agriculture on the advice of ATIC.

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