BioThink, Vol -2, Issue -1
ISSN: 3048-7943

# *"Empowering Farmers through Smart Agricultural Training: Building Resilience with NMAET and ATMA"*

**VIDYAWATI, R. S. JADOUN**

College of Agribusiness Management, Govind Ballabh Pant University of Agriculture & Technology, Pantnagar, Uttarakhand-263153, India

E-mail: vidyafeb22@gmail.com*

## Introduction

Agriculture is the backbone of livelihoods for millions in India, contributing approximately 18% to the national GDP and employing over 54% of the population. Despite its central role in ensuring food security and economic resilience, the sector faces persistent challenges such as outdated farming practices, market instability, and the escalating impacts of climate change. Training and development programs have emerged as transformative tools, equipping farmers with essential skills and modern techniques to adopt sustainable practices. Initiatives like the National Mission on Agricultural Extension and Technology (NMAET) and the Agricultural Technology Management Agency (ATMA) have played a significant role in addressing these challenges by bridging knowledge gaps, fostering innovation, and enhancing productivity. Notably, NMAET has trained more than 14.5 million farmers since 2015, while ATMA has established over 25,000 farmer field schools to strengthen knowledge-sharing and capacity-building efforts. This article examines the strategic importance of these programs in driving sustainable agricultural growth and empowering India's farming community.

Agriculture supports a major part of India's population, with ATMA revolutionizing extension systems under NATP (1998). This district-level society integrates research, farmer services, and planning to promote sustainable technologies and market linkages across all 676 districts, enhancing agricultural innovation and implementation [1&2]. ATMA's decentralized, participatory approach, including Strategic Research and Extension Plans (SREPs), empowers farmers by addressing regional agro-climatic needs. In Uttarakhand, ATMA initiatives in Rudraprayag and Udham Singh Nagar have enhanced commercial agriculture and inclusivity, particularly for smallholders and women farmers, through Farmer Interest

Groups (FIGs) and capacity-building programs. These efforts align with national goals of doubling farmer incomes and sustainability. However, challenges like resource constraints, bureaucratic delays, and uneven farmer participation remain [3]. This paper critically examines ATMA's structure, objectives, and role, highlighting its effectiveness in training, women's participation, and extension reforms.

## The objectives of this Study are

1. To examine NMAET and ATMA's role in sustainable farming extension services.
2. To assess the impact of NMAET and ATMA on productivity and resource management.
3. To explore the impact of decentralized agricultural extension on farmer development.
4. To highlight success stories showcasing the outcomes of ATMA initiatives.
5. To explore the benefits and propose recommendations for enhancing efficiency and outreach.

## Methodology

This study uses secondary data, including government reports, policy documents, research articles, journals, and case studies on NMAET and ATMA. Insights were gathered from credible online resources, agricultural institutions, and KVKs to analyze training initiatives, successes, and challenges.

## Findings

**The Role of Training in Agriculture:** Agricultural training empowers farmers by promoting modern technologies, efficient resource management, market linkages & inclusivity, enhancing crop production, pest management, and marketing while empowering women and marginal farmers.

## NMAET: Transforming Agricultural Training & Extension, and Sustainability in India

The NMAET enhances agricultural extension through four sub-missions focusing on training, capacity building, and comprehensive development:

**The Sub Mission on Agricultural Extension (SAME)** transforms extension services through farmer-driven, participatory strategies. Key initiatives include Skill Development Programs with workshops and demonstrations, Digital Outreach via mobile apps and portals, and Capacity Building of Extension Workers like Block Technology Teams (BTTs). Complementing SAME, schemes like ATMA promote decentralized, demand-driven services, while National e-Governance in Agriculture integrates technology for better engagement. Central Sector Schemes, including Mass Media

Support and Agri Clinics & Agri Business Centres (ACABC), enhance information dissemination and entrepreneurship. Kisan Call Centres (KCC) and research-based Extension Support strengthen outreach, fostering sustainable practices and empowering farmers across India.

The goal of **the Sub-Mission on Seed and Planting Material (SMSP)** is to increase agricultural output by improving seed quality and availability. It emphasises timely availability, raising seed replacement rates, and promoting certified seeds. The establishment of Seed Villages for local seed production, infrastructure development for seed processing, certification, and testing, and farmer training on seed technology are some of the major projects that promote self-reliance and sustainable agriculture.

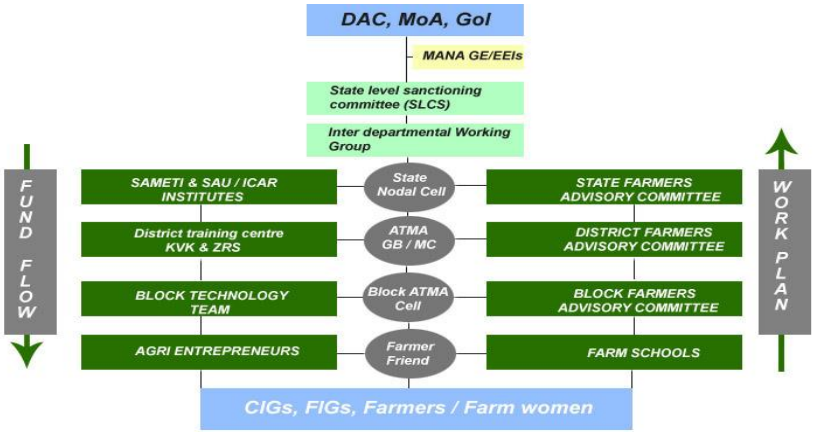
Agricultural mechanisation is promoted by **the Sub Mission on Agricultural Mechanisation (SMAM),** which emphasises operation, maintenance, and safety through practical equipment training. Small farmers are guaranteed reasonably priced access to equipment through Custom Hiring Centres (CHCs). Through the promotion of region-specific equipment, grants, and testing facilities, SMAM improves Indian agriculture's sustainability, inclusivity, and productivity.

By emphasising Integrated Pest Management (IPM) using environmentally benign methods and less chemical use, **the Sub-Mission on Plant Protection and Plant Quarantine (SMPP)** protects crop health, bio security, and sustainable agriculture. To stop outbreaks, lower crop losses, and increase food security, it involves training in Plant Health Diagnostics, enhanced quarantine facilities, and enhancements to pest surveillance systems [5].

## ATMA: Revolutionizing Agricultural Extension through Decentralization

The Agricultural Technology Management Agency (ATMA) modernized India's agricultural extension by decentralizing operations and adopting farmer-centric approaches. Initially a pilot under the National Agricultural Technology Project (NATP) from 1998-2005, it tested innovative strategies in 28 districts across seven states. ATMA was scaled up nationally in 2004-05. Since its inception, ATMA has expanded to 739 districts by 2023, with a budget of Rs. 7,469.68 crore up to December 2023. It has mobilized 6,092 Block Technology Teams (BTTs), strengthening links between research institutions, extension agencies, and farmers, making it one of India's largest agricultural extension networks [5]. ATMA

promotes good agricultural practices through initiatives like Farm Schools, Front Line Demonstrations, Exposure Visits, and Farmers' Fairs, fostering peer learning and networking. It also offers training programs, skill development, and agricultural literature. By strengthening farmer groups, encouraging private sector involvement, and enhancing women's participation, ATMA has transformed extension services into a more inclusive, technology-driven system, boosting sustainable agricultural development. The ATMA organizational framework is structured with several efficient levels:




***Source:*** *https://agriwelfare.gov.in/en/Guideextension*

ATMA follows a decentralized framework for effective agricultural extension services. At the national level, the Ministry of Agriculture provides guidelines, while the State Level Sanctioning Committee (SLSC) offers direction and approval. At the district level, the Governing Board and ATMA Management Committee oversee program implementation. Block Technology Teams (BTTs) and Farmer Advisory Committees (FACs) work at the block level, collaborating with local officers, farmer groups, and institutions. At the village level, Farmer Interest Groups (FIGs) and partnerships with public, private, NGO, and Para-agencies ensure grassroots impact. The integration of Farmer Information and Advisory Centres (FIACs) helps disseminate technology and practices, making ATMA essential for India's agricultural transformation [1&2].

## Empowering Farmers: ATMA Training's Real-World Impact on Sustainability

**Success Stories; Case 1:** Indira Rana and her women's group have set an inspiring example of natural farming through ATMA training. By eliminating chemicals and using natural inputs like cow dung, urine, and

plant extracts, they've reduced costs, improved crop quality, and demonstrated that sustainable farming can be economically viable.

**Case 2: Subhash Palekar's natural farming boosts apple production in Himachal Pradesh:**

Through ATMA's training farmers have successfully adopted Subhash Palekar Natural Farming (SPNF), achieving impressive results. An apple grower increased production from 450 to 650 boxes and reduced costs by using organic inputs. Diversifying with peas and cauliflower added ₹1 lakh to his income, showcasing SPNF's sustainable impact [7].

**Case 3:**

Farmers trained under ATMA have successfully adopted beekeeping, with some earning over ₹2 lakh annually. In Muzaffarpur, Bihar, Ms. Anita Kushwaha began her beekeeping venture in 2004-05 with an initial investment of ₹5,000 under ATMA's support, including the BTT of RAU, PUSA, Samastipur. Starting with 2 boxes, she expanded to 250, significantly increasing productivity. Her success earned recognition from the Bihar Agriculture Management Extension Training Institute, which highlighted her contribution to rural entrepreneurship and beekeeping as a viable agri-enterprise for rural youth [4].

**Case 4:**

ATMA initiatives in Madurai have helped farmers optimize resource efficiency by adopting precision farming techniques, including drip irrigation, soil testing, and crop monitoring, with guidance and support from KVKs and the Madurai Farmers Association. And farmers in Madurai have successfully adopted GPS-based soil mapping and crop-specific nutrient management, boosting yields and reducing costs. The initiative provides equipment rental, workshops, and market linkages, empowering communities in Usilampatti and Melur. ATMA and farmers associations bridge research and field applications for sustainable, profitable farming [6].

## Benefit of Training in Agri Sector

Training programs for farmers in the agricultural sector provide several key benefits, significantly enhancing productivity, profitability, and sustainability. Improved agricultural productivity results from farmers gaining skills in modern farming techniques, leading to higher yields and better resource use, including water, fertilizers, and seeds. Access to advanced agricultural technologies, such as precision farming, mechanization, and biotechnology, boosts efficiency and reduces operational costs. Training also promotes sustainable farming practices like organic farming,

integrated pest management (IPM), and water conservation, ensuring long-term environmental benefits.


***Source:*** *https://agriwelfare.gov.in/*

Farmers learn better resource management, optimizing inputs and minimizing waste, which enhances efficiency while protecting the environment. Market-oriented training equips farmers with knowledge on market trends, demand forecasting, and value-added products, allowing them to make informed decisions and increase profits. Additionally, financial literacy training helps farmers manage income, save effectively, and access credit for farm improvements.

Programs also focus on gender empowerment, increasing women's participation in decision-making and entrepreneurship, leading to gender equality in agriculture. Networking and peer learning through workshops and exposure visits help farmers share practical experiences. Finally, well-trained extension services ensure timely and accurate advice. By fostering entrepreneurship and self-reliance, ATMA's training initiatives contribute to improved livelihoods and long-term agricultural growth across India [2].

## Conclusion & Prospects for Training in Agriculture

In conclusion, agricultural training initiatives like those run by NMAET and ATMA are revolutionising Indian agriculture by giving farmers the tools, resources, and know-how they need to implement sustainable practices and increase output. These programs help farmers make better decisions, manage resources more effectively, and produce better economic results by bridging the gap between traditional farming and contemporary technologies. But issues like inadequate infrastructure, budgetary limitations, and low awareness still exist. Simplified funding, more awareness, and improvements in rural infrastructure are necessary to guarantee long-lasting effects. Mobile apps, e-learning platforms, and AI-

driven advisory systems are examples of digital technologies that should be integrated into agricultural training in the future to give farmers access to real-time, easily available training and professional advice.

In addition to promoting equality, these digital tools will facilitate the adoption of creative farming techniques. Furthermore, training modules tailored to a particular location would guarantee relevance and efficacy by addressing local issues like crop diversification in flood-prone areas or water conservation in desert areas. Supporting initiatives that are focused on women is also essential for empowering female farmers, advancing their expertise, and boosting their economic output. Through encouraging farmer participation and attending to local needs, these initiatives can promote sustainable, targeted, and inclusive agricultural development. The agriculture sector in India can attain sustainable growth if more women participate and contemporary techniques and market connections are adopted. Resilience and prosperity will be fuelled by innovation and cooperation, which will benefit farmers, families, and the larger agricultural community.

## References:

1. ATMA Guidelines, 2014 under NMAET. Guidelines for the centrally sponsored scheme “national mission on agricultural extension and technology (NMAET)” to be implemented during the XII plan. Department of Agriculture and Cooperation, Govt. of India. 2014. https://diragrijmu.nic.in/cssguidelines/smae.pdf
2. Guidelines for Support to State Extension Programmes for Extension Reforms (ATMA) Scheme, 2018. *Directorate of Extension Department of Agriculture, Cooperation & Farmers Welfare Ministry of Agriculture & Farmers Welfare Government of India*, 104. https://extensionreforms.da.gov.in/PDF/atmaguid23814.pdf
3. Naidu, J. Y. N., Philip, H., Asokhan, M., Balasubramanian, R., & Duraisamy, M. R. (2017). Constraints Faced by Stakeholders under Agriculture Technology Management Agency (ATMA). *Journal of Extension Education*, *28*(4), 5768-5774.
4. Singh, D. K., & Singh, P. (2014). Study of Effective implementation of Agricultural Technology Management

Agency through case studies in Bihar. *International Journal of Agriculture, Environment and Biotechnology*, *7*(1), 173-178.

**Website:**

5. Annual Report 2023-24. Department of Agriculture & Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India. Accessed on 25-11-2024. https://agriwelfare.gov.in/Documents/AR_English_2023_24.pdf
6. List of Registered Farmers Association – Madurai. Accessed on 25-11-2024. https://agritech.tnau.ac.in/farm_association/pdf/Registered%20Farmers%20Association-%20Madurai.pdf
7. https://spnfhp.nic.in/SPNF/en-IN/index.aspx
8. https://agriwelfare.gov.in/