

## Perspective

# Implications for Rice Production Systems of Agricultural Technologies

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### Dates

Received: 30-Jul-2020,

Manuscript No.

OAJOST-22-70763; Editor

assigned: 01-Aug-2020,

PreQC No.

OAJOST-22-70763 (PQ);

Reviewed: 15-Aug-2022, QC

No. OAJOST-22-70763;

Revised: 04-Oct-2022,

Manuscript No.

OAJOST-22-70763 (R);

Published: 12-Oct-2022,

DOI: 10.11131/

OAJOST.2022.10.007.

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## 1. Introduction

Agricultural technologies are created to boost output and eliminate socioeconomic, biological and chemo physical restrictions connected to crop production systems. In the past three decades, there has been a growing understanding that technologies must be customized to the needs of farmers as well as to long term sustainability objectives, such as estimates of climate change. The intergovernmental panel on climate change's climate estimates indicates future rainfall patterns that will be out of balance, growing seasons that will be shorter causing intermittent and terminal droughts and temperature extremes that will all endanger agricultural production. In order for agricultural technologies to meet the demands of smallholder farmers, best fit solutions must be thoroughly analyzed in light of current concerns. To combat climate extremes and variability, climate smart agriculture defined as agricultural techniques that sustainably increase productivity, production system resilience and lower greenhouse gas emissions is necessary. Future food production systems will be significantly dependent on the effective integration of a variety of climate responsive and environmentally beneficial technology. Strong policies that will mould institutions are required to achieve increased agricultural output and long term financial rewards. Although there is now clear scaling up messages, more testing and development are still needed for adaptation to climate extremes and emissions reduction.

## 2. Description

The ATMA is presently India's premier programme for offering extension services. It operates at the district level, directing extension efforts in accordance with each district's Strategic Research and Extension Plan (SREP), which was created using the Participatory Rural Appraisal (PRA) technique. The ATMA Management Committee (AMC), which is in charge of organizing the district's extension efforts, is presided over by the ATMA project director. The AMC is composed of the district's research organizations and line departments' leaders. When creating the Block Action Plan (BAP) and carrying out extension operations at the block level, the Block Technology Team (BTT) and Farmer Advisory Committee (FAC) primarily meet at the Farm Information and Advisory Centre (FIAC). A State Extension Work Plan (SEWP) is created at the state level by an interdepartmental Working Group (IDWG) to combine the district SREPs. At the district level, ATMA has yet to establish itself as an independent institution. In 2010, the idea of a "Farmer Friend" (FF) for every two villages was fully institutionalized, creating a relationship from a block to a village. A FF is a progressive farmer who is directly employed by the block technology manager and has the minimum requirement of passing the matriculation or intermediate exams. In general, the ATMA offers a bottom up, decentralized structure for the delivery of extension services. Through the



increased financial and personnel resources, ATMA has been successful in highlighting the significance of extension systems in India. In the example of rice farming, ATMA was able to broaden the scope of extension activities and be more responsive to different stakeholders, enhancing the legitimacy of the extension provision system. Additionally, the Department of Agriculture's (DoA) many programmes have been able to converge thanks to ATMA and the DoA's interaction with other line departments has improved (*i.e.* agricultural engineering, animal husbandry and fisheries). This has been especially advantageous for rice farmers who are involved in extracurricular income-generating activities. Rural areas have now been reached by public extension systems thanks to ATMA's bottom up approach.

### **3. Conclusion**

The key reasons for disparities in ATMA's impact are variations in leadership and dedication. The provision of suitable incentives to retain workers and ensuring that staffs roles are filled at all times are recurring issues encountered by ATMA. To make greater use of the current research capacity, the connections with Krishi Vigyan Kendras (KVKs, farm science centers) need to be aggressively developed. The SREP and SEWP implementation is hampered by frequent delays in the center's transfer of funding to the states. There is an unrealized opportunity for ATMA to close the knowledge gap because several central government programmes lack the funding necessary for knowledge assistance. To put more emphasis on the productivity of significant crops, like rice, ATMA also needs to create joint research projects that are devoted to a particular crop. Last but not least, despite the FF initiative, farmers influence on block level decision making remains minimal, necessitating increased investment in the capacity building of village level representatives and farmer interest organizations.